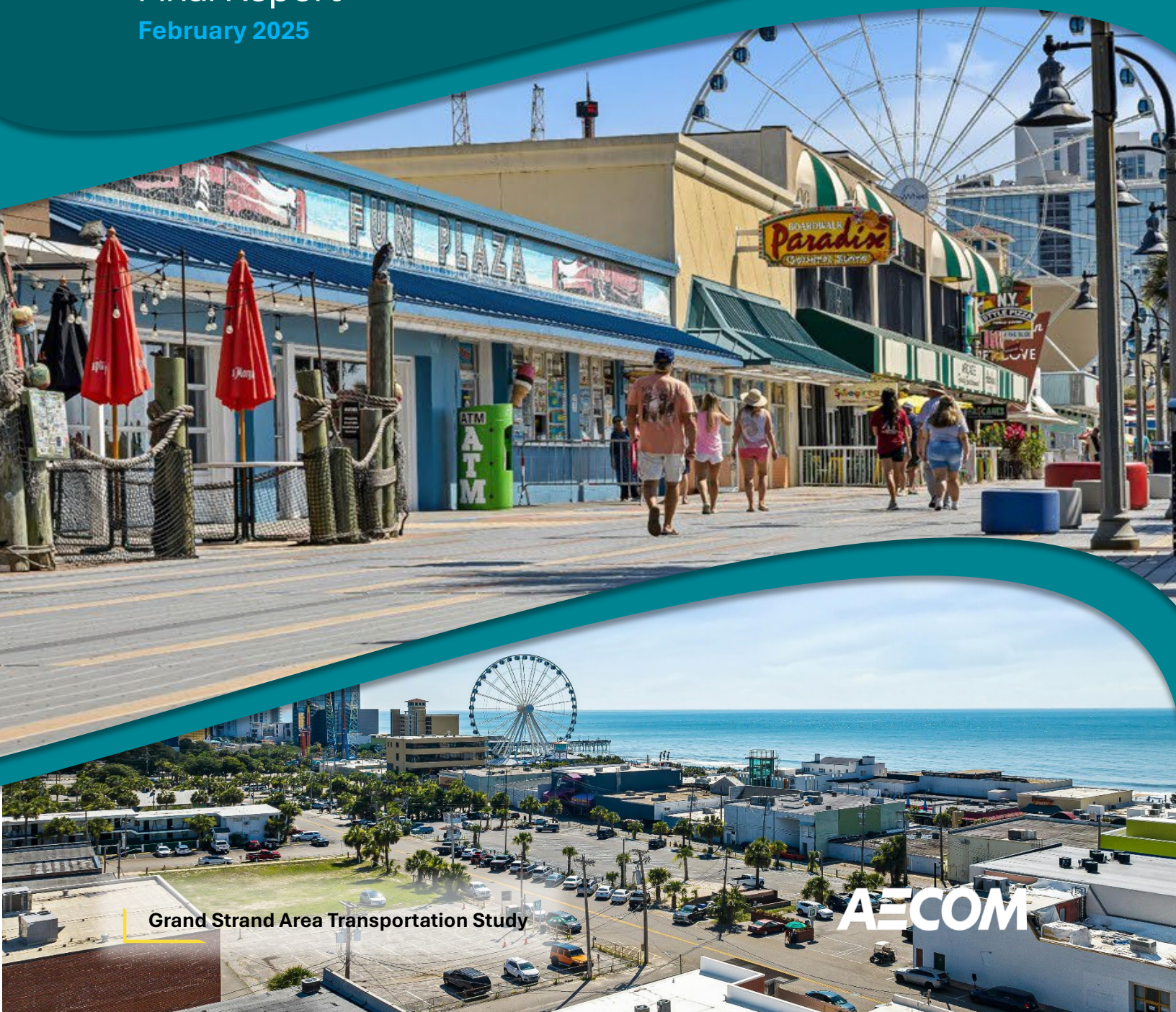
Safety Action Plan

GSATS

Final Report

February 2025



Grand Strand Area Transportation Study

AECOM

Acknowledgements

The Grand Strand Area Transportation Study (GSATS) would like to extend thanks and appreciation to the residents, community members, advocacy groups, municipality and county staff, SCDOT and NCDOT, and all stakeholders who participated in the study process, communication, and coordination efforts.

- City of Myrtle Beach
- City of North Myrtle Beach
- City of Conway
- City of Georgetown
- Town of Surfside Beach
- Town of Ocean Isle Beach
- Town of Shallotte
- Town of Holden Beach
- Town of Sunset
- Town of Calabash
- Horry County
- Georgetown County
- Brunswick County
- Cape Fear RPO
- Coast RTA
- Waccamaw Regional Council of Governments
- SCDOT
- NCDOT
- FHWA
- Cycling Community Liaison

Contents

Acronyms

B/C	Benefit Cost Ratio
CEQ	Council on Environmental Quality
CEJST	Climate and Economic Justic Screening Tool
CMP	Congestion Mitigation Process
CRF	Crash Reduction Factor
DMV	Division of Motor Vehicles
ePDO	Equivalent Property Damage Only
EVP	Emergency Vehicle Preemption
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FSI	Fatal and Serious Injury
GIS	Geographic Information System
GSATS	Grand Strand Area Transportation Study
HFB	Hybrid Flashing Beacon
HFST	High Friction Surface Treatment
HIN	High Injury Network
MPO	Metropolitan Planning Organization
MTP	Metropolitan Transportation Plan
NHTSA	National Highway Traffic Safety Administration
NC	North Carolina
NCDOT	North Carolina Department of Transportation
NOAA	National Oceanic and Atmospheric Administration
NOFO	Notice of Funding Opportunity
PHB	Pedestrian Hybrid Beacon
RCI	Reduced Conflict Intersection
RRFB	Rectangular Rapid Flashing Beacons
SAP	Safety Action Plan
SHSP	Strategic Highway Safety Plan
SC	South Carolina
SCDOT	South Carolina Department of Transportation
SRTS	Safe Routes to School
SS4A	Safe Streets and Roads for All
TIP	Transportation Improvement Program
TPM	Transportation Performance Measures
TWLTL	Two Way Left Turn Lane
USDOT	US Department of Transportation
VRU	Vulnerable Road User

Using this Plan

This Safety Action Plan (SAP) is structured parallel to the Self-Certification Eligibility Worksheet outlined in the Notice of Funding Opportunity (NOFO), which is the formal announcement describing the program and application process. The corresponding elements and their location in the document have been identified in the following worksheet with any additional information necessary to meet the requirements. In accordance with the NOFO, questions 3, 7, and 9 must be answered with "yes." At least four of the six remaining questions (1,2,4,5,6 and 8) must also be "yes."

Item Number	Question	Answer, SAP Location
1	**Are both of the following true?** ▪ A high-ranking official and/or governing body in the jurisdiction publicly committed to an eventual goal of zero roadway fatalities and serious injuries; and ▪ The commitment includes either setting a target date to reach zero OR setting one or more targets to achieve significant declines in roadway fatalities and serious injuries by a specific date.	Yes, page 2 and Appendix A
2	**To develop the Action Plan, was a committee, task force, implementation group, or similar body established and charged with the plan's development, implementation, and monitoring?**	Yes, page 3
3	**Does the Action Plan include ALL of the following?** ▪ Analysis of existing conditions and historical trends to provide a baseline level of crashes involving fatalities and serious injuries across a jurisdiction, locality, Tribe, or region; ▪ Analysis of the location where there are crashes, the severity, as well as contributing factors and crash types; ▪ Analysis of systemic and specific safety needs, as needed (e.g., high-risk road features or specific safety needs of relevant road users); and, ▪ A geospatial identification (geographic or locational data using maps) of higher risk locations.	Yes, pages 13-20 and Project Dashboard
4	**Did the Action Plan development include all of the following activities?** ▪ Engagement with the public and relevant stakeholders, including the private sector and community groups; ▪ Incorporation of information received from the engagement and collaboration into the plan; and ▪ Coordination that included inter- and intra-governmental cooperation and collaboration, as appropriate.	Yes, pages 7-12 and Appendix C
5	**Did the Action Plan development include ALL of the following?** ▪ Considerations of equity using inclusive and representative processes; ▪ The identification of underserved communities through data; and ▪ Equity analysis developed in collaboration with appropriate partners, including population characteristics and initial equity impact assessments of proposed projects and strategies.	Yes, pages 20 and 43, and Appendix J

Item Number	Question	Answer, SAP Location
6	**Are BOTH of the following true?** ▪ The plan development included an assessment of current policies, plans, guidelines, and/or standards to identify opportunities to improve how processes prioritize safety; and ▪ The plan discusses implementation through the adoption of revised or new policies, guidelines, and/or standards.	Yes, pages 21-25 and Appendix B
7	**Does the plan identify a comprehensive set of projects and strategies to address the safety problems in the Action Plan, with information about time ranges when projects and strategies will be deployed, and an explanation of project prioritization criteria?**	Yes, pages 34-42, Appendix G, and Appendix H
8	**Does the plan include BOTH of the following?** ▪ A description of how progress will be measured over time that includes, at a minimum, outcome data. ▪ The plan is posted publicly online.	Yes, page 42 and www.gsats.org
9	**Was at least one of your plans finalized and/or last updated between 2019 and April 30, 2024?**	*Yes, Appendix A

*FHWA's SS4A Program Facts 2024 notes the FY2025 Notice of Funding Opportunity (NOFO) is expected to be announced before the end of March 2025. Item 9 from this 2024 Self-Certification Worksheet provides a specific date range related to the 2024 application cycle. It is anticipated that the end date will change to April 30, 2025, in the FY2025 NOFO. Therefore, an affirmative response is provided for this question to correspond with the expected revision.

The Safety Action Plan is publicly available on the Grand Strand Area Transportation Study (GSATS) agency website (www.gsats.org) and has been supplemented with an interactive dashboard package for improved understanding of the project constraints, equity considerations, public input, and project selection. The dashboard is housed on the GSATS website and may be located by clicking on the link.

This GSATS Safety Action Plan meets the requirements identified in the Self-Certification Worksheet in accordance with the NOFO by answering "Yes" to, questions 3, 7, and 9 and answering "Yes" to the six remaining questions (1,2,4,5,6 and 8). GSATS and the Steering Committee are committed to an eventual goal of zero roadway fatalities and serious injuries in alignment with the targets established by our partners at the South Carolina Department of Transportation and the North Carolina Department of Transportation (**See Appendix A**).

1.0 Introduction

The Safe System Approach to roadway safety is the Federal Highway Administration's (FHWA's) initiative to achieve the **zero deaths vision**. The Grand Strand Area Transportation Study (GSATS) is committed to implementing the Safe System Approach for their service area, beginning with the development of a Safety Action Plan (SAP). The SAP is the first step toward implementing safety improvements with federal funding from the Safe Streets and Roads for All (SS4A) program.

The goal of this SAP is to plan, develop, and operate equitable streets and networks that prioritize safety, comfort, and connectivity for all users.

This SAP was developed in accordance with SS4A program requirements and aims to ensure the needs of the GSATS region are met and the study outcomes align with FHWA's safety initiatives. The SAP is a data driven examination of safety needs that correlate the system user types, equity, accessibility, and vulnerable road users to crash information depicting cause, context, and location. The project team, stakeholders, and public were consulted throughout the project to establish a baseline of safety concerns and consensus on study recommendations to include policy, education, enforcement, and engineering. This SAP includes recommendations, countermeasures, cost estimates, project prioritization, project tracking mechanism, best practices, and funding opportunities to aid in the pursuit of the **zero deaths vision**.

Crashes between 2019-2023

- Crashes: 63,318
- Serious Injuries: 1,919
- Fatalities: 346
- Bike/Ped Fatalities: 99

The **Grand Strand Area Transportation Study** is the Metropolitan Planning Organization (MPO) responsible for transportation planning and programming in portions of Horry County and Georgetown County in South Carolina (SC) and portions of Brunswick County in North Carolina (NC).

The Safe System approach acknowledges that humans make mistakes, and those mistakes should never lead to death. Therefore, by anticipating human error and designing and managing infrastructure to reduce risk, the impact of those mistakes can be mitigated to avoid serious harm or death. This holistic approach addresses protections for safe road users, safe vehicles, safe speeds, safe roads, and post-crash care. The US Department of Transportation (USDOT) recognizes that humans make mistakes, humans are vulnerable, prevention is a shared responsibility, safety is proactive, and redundancy is crucial. The Safe System approach implemented by GSATS includes innovative design, strategic policies, and committed local leadership in support of the transportation safety initiatives identified by the South Carolina Department of Transportation (SCDOT) and North Carolina Department of Transportation (NCDOT). SCDOT's Strategic Highway Safety Plan (SHSP) outlines the Target Zero initiative to reduce fatalities and serious injuries over time. NCDOT's SHSP outlines the Vision Zero plan to reduce all fatalities and serious injuries by half by 2035, moving toward zero by 2050.

GSATS has adopted the Transportation Performance Targets for Safety in support of the Target Zero and Vision Zero initiatives by SCDOT and NCDOT and has committed to planning and programming projects that advance the achievement of those targets.

(see Appendix A)

The GSATS Safety Action Plan

Safe Streets and Roads for All (SS4A) is USDOT's discretionary program funding regional, local, and tribal initiatives to prevent roadway deaths and serious injuries. In 2024, GSATS was awarded a SS4A grant for the development of this comprehensive Safety Action Plan (SAP). This Plan will identify the most significant roadway safety concerns in the GSATS communities and strategies to address roadway safety issues aimed at reducing and eliminating serious-injury and fatal crashes affecting all roadway users. The SAP also supports the goals and objectives identified in the GSATS Metropolitan Transportation Plan (MTP) 2045 and current 2019-2028 Transportation Improvement Program (TIP).

Implementation grants may be used for several project types including sidewalks, trails, bike lanes, and crosswalks; low-cost, tactical strategies; traffic calming and speed management; lighting, signals, and safety; connecting schools and transit; street design changes; education and enforcement; and safety action planning. A review of the existing documents, policies, guidelines, plans, and design guidance was conducted at the onset of the study. A summary of those findings can be found in **Appendix B**. The purpose of this review was to identify strategies to address safety and identify programs with evidence of measurable success.

According to the 2021 National Highway Traffic Safety Administration (NHTSA) data, **South Carolina had the highest fatality rate in the nation. North Carolina was ranked 18**. Additionally, South Carolina was ranked fourth for pedestrian related fatalities nationally and North Carolina was ranked 17.

Project Timeline

May ‘24

Kickoff

Steering Committee Meeting

Round 1 Public Meetings

Countermeasure Identification

Steering Committee Meeting

Round 2 Public Meetings and Draft Report

Final Report and Implementation Plan

Feb ‘25

Process

The Safety Action Plan (SAP) is focused on the transportation network within the GSATS boundary. **The GSATS project team identified a Steering Committee comprised of the leadership assisting with the development, implementation, and monitoring of the SAP.** Steering Committee representatives include the City of Myrtle Beach, City of North Myrtle Beach, City of Conway, City of Georgetown, Town of Surfside Beach, Town of Ocean Isle Beach, Town of Shallotte, Town of Holden Beach, Town of Sunset, Town of Calabash, Town of Carolina Shores, Horry County, Georgetown County, Brunswick County, Cape Fear Rural Planning Organization, GSATS Metropolitan Planning Organization, Coast Rural Transit Authority, SCDOT, NCDOT, FHWA, and a community liaison for cycling.

The SAP development plan enabled the project team, stakeholders, and the public to have an active role in identifying safety concerns, countermeasures, policy guidance, and investments resulting from the study. The GSATS Project Team and Steering Committee will serve as the body charged with the plan’s development, implementation, and monitoring.

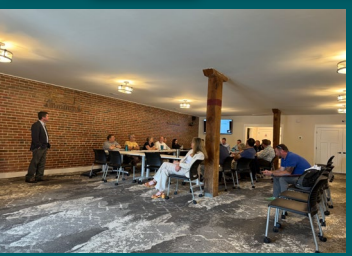
The GSATS website will host the Safety Action Plan and associated dashboard to aid in project tracking beyond the finalized and adopted SAP.

The SAP will guide safety investments for initiatives and infrastructure across the region and serve as a basis for GSATS and its member partners to seek funding through the SS4A program.

More information on the public, stakeholder, and steering committee engagement can be found in Section 3 Community Engagement.

Grand Strand Area Transportation Study

Click Link

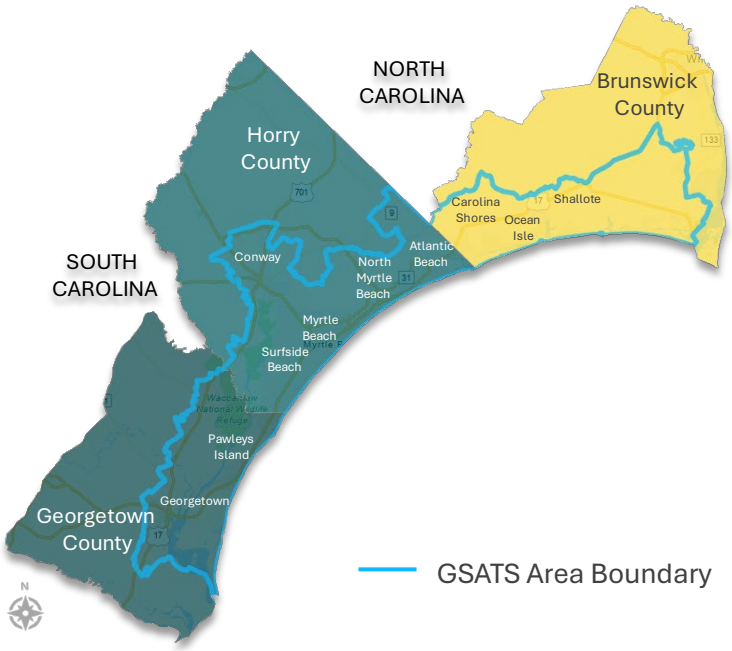




2.0 Study Area and Characteristics

GSATS is the Metropolitan Planning Organization (MPO) responsible for transportation planning and programming in portions of Horry County and Georgetown County in South Carolina and a portion of Brunswick County in North Carolina. The GSATS area includes the municipalities of Myrtle Beach, Conway, North Myrtle Beach, Georgetown, Surfside Beach, Shallotte, Sunset Beach, Carolina Shores, Calabash, Holden Beach, Ocean Isle Beach, Varnamtown, Briarcliffe Acres, Atlantic Beach, and Pawleys Island.

- GSATS is a coastal region experiencing expansive population growth and seasonal tourism.
- On average, 4% of housing units in the region do not have a vehicle.
- Georgetown has the highest percentage of families in poverty in the GSATS area at nearly 36%.
- Population growth prominent in Horry County and Brunswick County. Growth in Georgetown County is upward and steady.
- 12% of the 2019 GSATS Network operating at an unacceptable level of service (Portions of US 17, US 501, and SC 90)
- Active transportation mode shift warranted by aging population, increasing density, bicycle and pedestrian facility additions, and tourism.



The Grand Strand region of North Carolina and South Carolina is a coastal area experiencing expansive population growth and seasonal tourism. Area characteristics include beautiful and scenic landscapes, coastal communities, suburban living, destination attractions, and historic towns spanning urban, suburban, and rural regions. The study area characteristics for this SAP are shaped by an understanding of the existing conditions, trends, opportunities, and challenges. The GSATS Metropolitan Transportation Plan 2045 (MTP) includes detailed descriptions and analysis of the natural, social, and physical environment of the study area, some of which has been captured below.

Natural and Cultural Resources

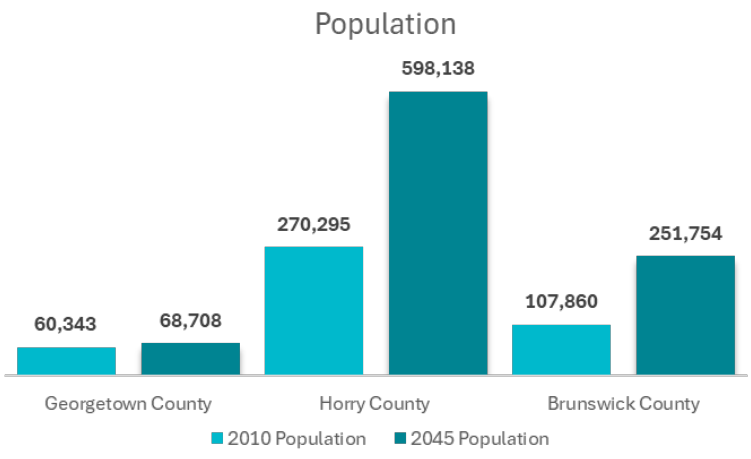
Among the natural attractions on the Atlantic Coast are beaches, wildlife management areas, rivers, streams, and wetland areas such as Brookgreen Gardens, Tom Yawkey Wildlife Center, Waccamaw National Wildlife Refuge, Winyah Bay, Waccamaw River, the Intracoastal Waterway, Green Swamp Preserve, Cape Fear River, Lockwood Folly River, and the Shallotte River.

Cultural resources include schools, libraries, museums, historic sites, hospital and medical facilities, parks and recreational facilities, airports, and cemeteries. Higher education facilities include Horry Georgetown Technical College, Coastal Carolina University, and Brunswick Community College. The museums include Georgetown County Museum, Horry County Museum, North Myrtle Beach Area Historical Museum, Franklin G. Burroughs-Simeon B. Chapin Art Museum, and Museum of Coastal Carolina. The airports in the area are the Conway-Horry County Airport, the Myrtle Beach International Airport, the Grand Strand Airport, the Georgetown County Airport, and Odell Willimson Airport. Historical sites include the Georgetown Lighthouse, Georgetown Historic District, Murrells Inlet Historic District, Pawleys Island Historic District, Conway Historic District, Myrtle Beach Atlantic Coast Line Railroad Station, Conway Post Office, and T.B. McClintic.

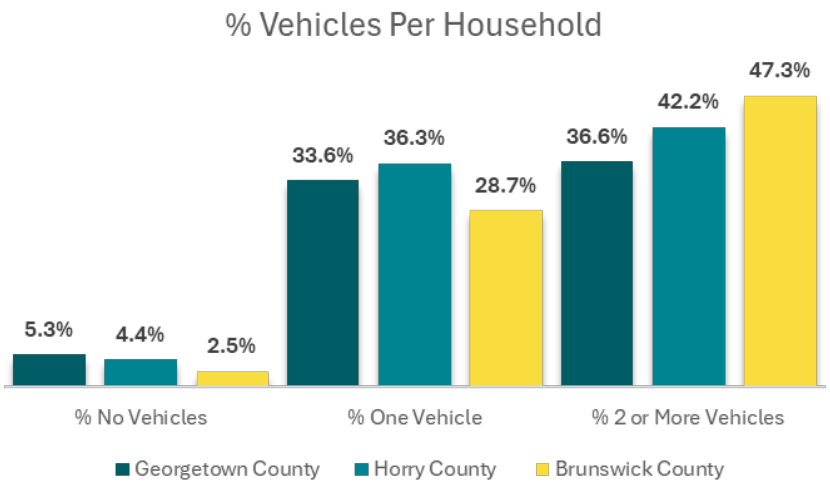
Of additional note are the Federal Emergency Management Agency (FEMA) Special Flood Hazard Areas and the National Oceanic and Atmospheric Administration (NOAA) flood risk areas. Given the GSATS region faces challenges to the transportation infrastructure resulting from extreme weather events, GSATS focuses on enhancements to the resilience of the transportation network. Extreme weather events may add demand to the transportation network as the primary departure routes identified for hurricane evacuation.

Population and Demographics

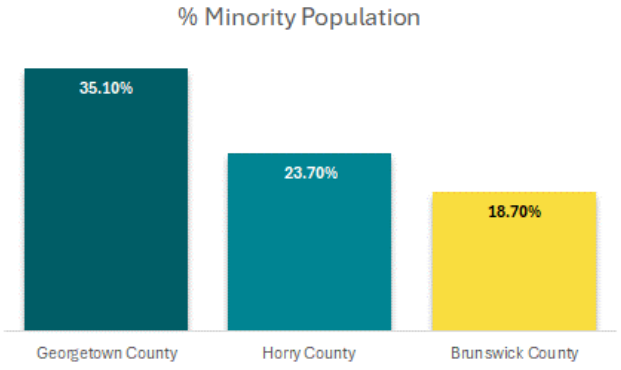
The GSATS MTP includes a detailed examination of historical and projected population growth and demographics in the study area from 2010 to 2045. In addition to the permanent population, seasonal tourism is shifting from summer visitors to those enjoying the area more consistently throughout the year. In the MTP, it is noted that the number of visitors in the GSATS region has increased from 18 million visitors in 2016 to 24 million visitors in 2019. Tourism brings additional people, vehicles, pedestrian and bicycle activity, motorcycle activity, transit ridership, and golf cart activity into the volumes and modes of travel carried by the transportation network. Livability criteria from the GSATS MTP highlights the percentage of households without vehicles.

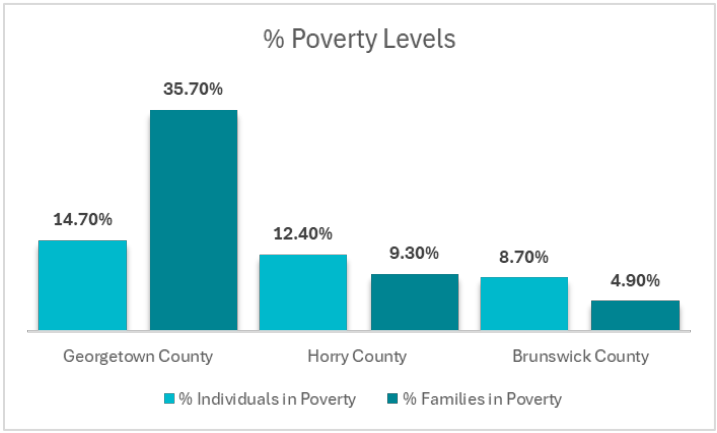


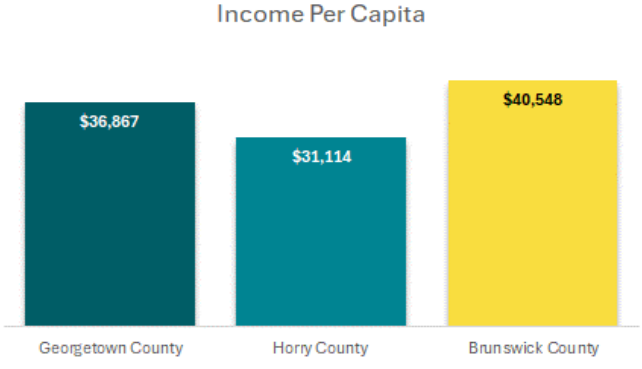
The Council on Environmental Quality (CEQ) advises identifying areas where the minority and low-income populations (1) exceeds 50 percent or (2) is "meaningfully greater" than the local neighborhood population. In the GSATS area, minority and low-income populations were determined by identifying those census block groups that have a higher percentage of those populations than the regional average. Georgetown County has the highest percentage of minority population and percentage of individuals and families in poverty in the study area. These population characteristics from the GSATS MTP for 2021 were included in the analyses for the SAP and considered an integral part of the decision-making process.



The Justice40 initiative is a federal policy to address environmental and economic disparities in disadvantaged communities. The Justice40 initiative aligns with broader goals of equity, environmental justice, and climate action with investments in clean energy infrastructure (clean transportation options), environmental justice considerations (inclusive decision making), job creation, workforce development, health, and resilience. Justice40 areas were obtained from the Climate and Economic Justice Screening Tool (CEJST) and aided in the identification of transportation disadvantaged communities identified if they are at or above the 90th percentile for diesel particulate matter exposure or transportation barriers, or traffic proximity and volume and are at or above the 65th percentile for low income. Those areas were included in the SAP analysis.







3.0 Community Engagement

Public participation and stakeholder engagement were essential to gather direct feedback on the safety concerns impacting the GSATS communities. The GSATS SAP included a project website, online interactive survey, eight public meetings, a meeting with representatives of the medical first responders, and three steering committee meetings. The project team met bi-weekly to collaborate on the study progress and process incoming data and feedback. Stakeholders and the public were integral to the development of the Safety Action Plan. In addition to joining the discussion during public meetings, the public used the project website to learn about the study, stay up to date on study progress, provide input via an online survey, and access the document and project dashboards. More information on Community Engagement can be found in **Appendix C.**

Steering Committee Meeting 1

The GSATS project team met with the Steering Committee to introduce the study effort and schedule, share a presentation with baseline crash information, learn their thoughts and concerns, and discuss the potential funding opportunities their communities could benefit from by participating in the Safety Action Plan. The meeting took place at the Conway Building and Planning Room on June 6, 2024.

During the meeting, the Steering Committee had open discussions prompted by survey polls to concentrate on the safety concerns within their communities and potential solutions. Overall, the Steering Committee indicated their concerns for safety are centered around fatalities that stem from congestion, speeding, and non-motorized system users. Travel by motorcycle is also a consideration due to the level of activity and special events that take place multiple times a year. Intersection safety, sidewalk gaps, and lack of bicycle accommodation were identified as network deficiencies. This is extended to access management for the urbanized areas of the network. Safety improvements should include countermeasures to address intersection safety, sidewalks, speeding, and education.

Steering Committee Meeting 2

The GSATS project team held a second meeting on September 10, 2024, with the Steering Committee to provide an update on study efforts including sharing a draft list of priority intersections and corridors. The team explained in detail the potential countermeasure of each intersection and corridor project and obtained feedback from Steering Committee members. The Steering Committee provided valuable input the project team used as project recommendations were being developed. The meeting also took place in the Conway Building and Planning Room.

Steering Committee Meeting 3

The GSATS project team met with the Steering Committee for a third time on December 4, 2024, to provide further updates on the potential countermeasures for each of the intersection and corridor projects and to receive feedback on the draft recommendations from Steering Committee members. Other study efforts were discussed, including the announcement of a demonstration grant awarded by the U.S. Department of Transportation to GSATS for an emergency service vehicle signal pre-emption. The meeting also took place in the Conway Building and Planning Room.

Special Focus Meeting

Following the first Steering Committee meeting, the project team met with representatives of the area medical centers to discuss the needs and safety concerns from their perspective as first responders. Response time, clearing times, and return times and routing were top among their concerns. Emergency vehicle signal preemption was a need they shared adding that a mechanism to determine optimized return trip routing upon departure from an incident would be beneficial as traffic has typically queued following a crash. Other concerns included the lack of shoulder space and passing areas inhibit response times. Added training, certification, and educational programs for paramedics was also discussed. Representatives noted some additional medical facilities were planned for construction in the region, which will expand their treatment capabilities. The meeting took place at Tidelands Health Facility in Market Commons on June 6, 2024.

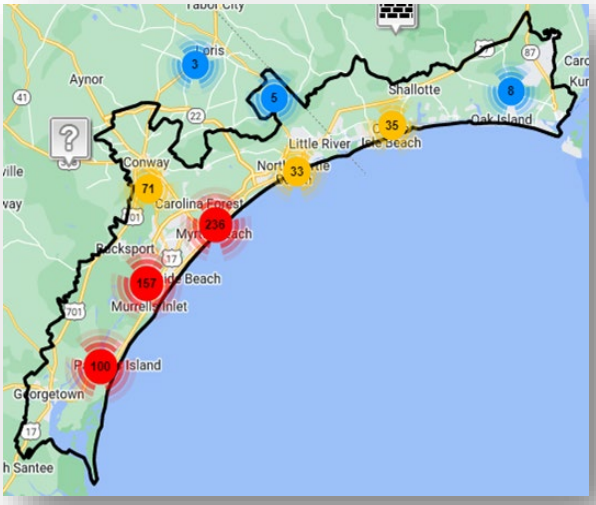
Public Outreach

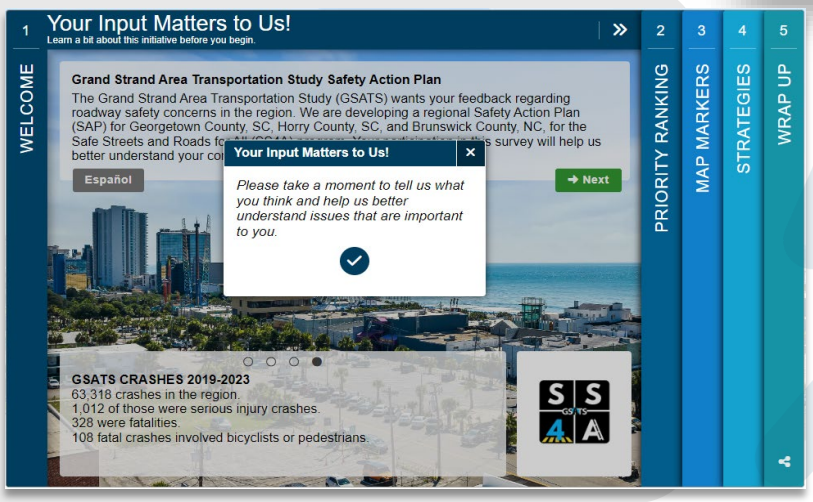
Project Website

A GSATS Safety Action Plan website (www.gsatssafetyactionplan.com) was developed for use during the study. The website included an introduction to the study, project schedule, public meeting information and interactive public survey, project information, and interactive dashboard of projects identified in the study with supporting mapping layers, and the final plan. Additionally, as part of the website and overall public involvement efforts, the project team sought to "brand" the SAP by developing a project logo and a QR code that linked to the project website.

Public Survey

The public participated in an online survey to gauge the safety concerns most prevalent in the community, the areas where those concerns are highest, and the countermeasures most supported as solutions are developed. The survey was provided in English and Spanish via links and instruction distributed via social media, flyers, and the project website. The survey period was open from July 8, 2024, to August 31, 2024. The survey was conducted via a crowdsourcing platform called MetroQuest. 246 participants provided 5,796 data points for inclusion in the evaluation of public feedback. The mapped survey data has been provided on the dashboard, which can be found on the agency website.





WHAT WE HEARD

Top Safety Concerns ...

246 Online Participants
5,796 Survey Data Points

	Concerns	Suggestions
Aggressive Driving	Tailgating, weaving in and out of traffic, aggressive behavior towards cyclists.	Increased monitoring, use of drones, hotlines for reporting, and availability of dash cams.
Driving Under the Influence	High incidence of DUI, including marijuana and alcohol use.	Hotlines for reporting unsafe drivers, stricter enforcement, and public awareness campaigns.
Red Light Running	Frequent red light running, leading to accidents and congestion.	Installation of red-light cameras and better enforcement.
Speeding	Excessive speeding, especially in residential areas and near schools.	Increased police presence, speed cameras, and public awareness campaigns.
Bicycle and Pedestrian Safety	Cyclists not obeying traffic laws, lack of bike lanes and sidewalks, intersection safety, and speeding.	Improved bicycle and pedestrian infrastructure, signage, bike corridors, and traffic calming.
Golf Cart/Moped Use	Unsafe use of golf carts and mopeds on roads, especially by tourists.	Registration and insurance requirements, limits on the number of passengers, and public education.
Driveway Access	Congestion and blocked access points, particularly at busy intersections.	More frontage roads and connectors, better signage, and relocation of certain facilities.
Incident Clearing Times	Long times to clear accidents, leading to traffic congestion.	Better traffic management during incidents and quicker response times.
Intersection Safety	Dangerous intersections, poor visibility, and lack of pedestrian crossings.	Improved signage, better traffic light timing, and removal of obstructions.
Road Conditions	Poor road maintenance, potholes, and inadequate infrastructure for increased traffic.	Regular maintenance, better construction planning, and improved road designs.
Traffic Congestion	High levels of congestion, particularly during peak hours and in tourist areas.	Better traffic light synchronization, more roads and bridges, and improved public transportation.

Favored Strategies




Education

- Distracted Driving Awareness
- Awareness of Bicycles and Pedestrians
- Motorcycle Awareness

Engineering

- Roadway Improvements (lighting, signage, intersections)
- Pedestrian Connectivity

Enforcement

- Driving Under the Influence
- Speeding
- Red Light Running

Emergency Response

- Reduce Emergency Response Times
- Improve Emergency Response Technology

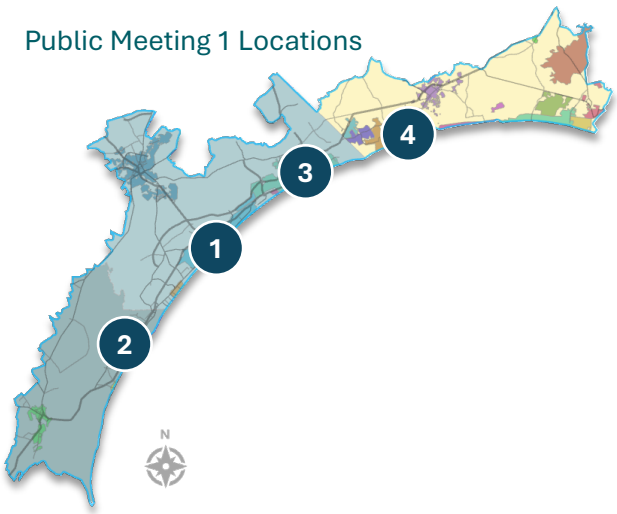
Public Meetings Round 1

The GSATS team and Steering Committee coordinated in an extensive effort to engage the public and encourage participation in the SAP process. The group prioritized messaging, accessibility, and strategically spaced locations around the region to promote attendance at the public meetings. Flyers and social media posts were used to share meeting dates, times, and locations. Public meeting notice flyers were posted in public buildings, shared on affiliate and partner agency websites, social media pages, and the project website. Prior to the meetings, a total of eighty location meeting specific road signs were placed in the respective region for the meeting to take place.

Four public meetings were held on two days at locations recommended by the steering committee and project team. The aim of these drop-in style meetings was to gain feedback and input from the public on safety concerns and issues they deemed important throughout the GSATS region.

In order to provide access to the communities throughout the GSATS region the following meeting dates, locations and times were selected:

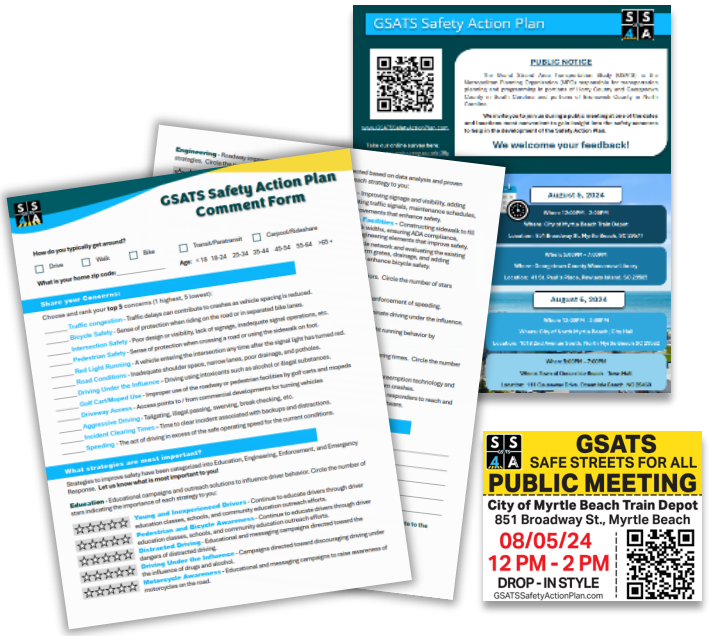
Public Meeting 1 Locations



1. **August 5, 2024**, City of Myrtle Beach Train Depot, 851 Broadway Street, Myrtle Beach, SC 12:00PM-2:00PM
2. **August 5, 2024**, Georgetown County Waccamaw Library, 41 St. Paul's Place, Georgetown, SC 5:00PM-7:00PM
3. **August 6, 2024**, City of North Myrtle Beach City Hall, 1018 2nd Ave. S, North Myrtle Beach, SC 12:00PM -2:00PM
4. **August 6, 2024**, Town of Ocean Isle Beach Town Hall, 111 Causeway Drive, Ocean Isle Beach, NC 5:00PM-7:00PM

Meeting displays included an introduction to the Safe Systems Approach, a map of the 2019-2023 FSI crashes, a station for the public to participate in the online survey via digital tablets or personal smart device, a list of proved safety countermeasures, and a station with digital mapping to facilitate discussions on particular areas of concern for the public.

Feedback provided to the project team during the first round of public meetings was captured on a comment form that emulated the online digital survey. Following the meeting, this information was recorded in the online survey for analysis and trends.



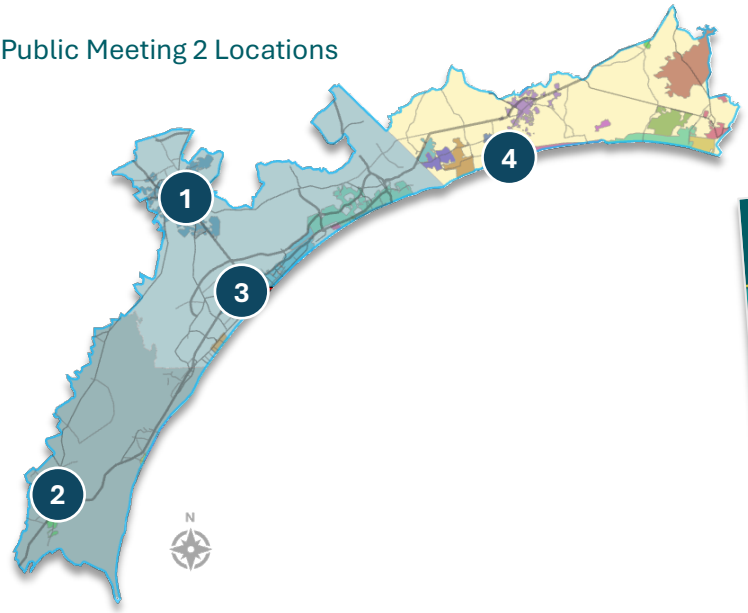
Public Meetings Round 2

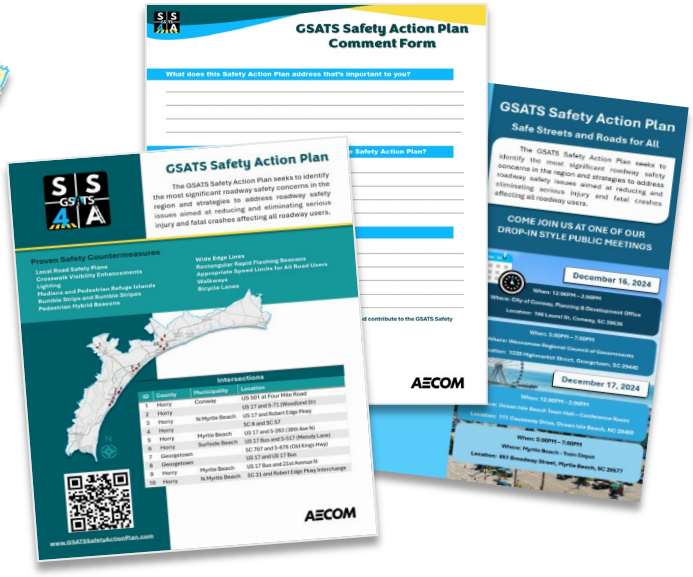
The GSATS team and Steering Committee again coordinated in an extensive effort to engage the public and encourage participation in a second round of meetings held in December 2024. The group utilized many of the same public involvement strategies aimed to garner maximum attendance at the meetings. Flyers and social media posts were again used to share meeting dates, times, and locations. Public meeting notice flyers were posted in public buildings, shared on affiliate and partner agency websites, social media pages, and the project website. As in the first round of meetings, a total of eighty meeting specific road signs were placed in the respective region prior to the meetings taking place. The aim of these drop-in style meetings was to present potential countermeasures for each of the identified intersection and corridor projects and to receive feedback and input from the public.

Meeting dates, locations and times were as follows:

1. **December 16, 2024**, City of Conway Planning & Development Office, 196 Laurel Street, Conway, SC 12:00PM-2:00PM
2. **December 16, 2024**, Waccamaw Regional Council of Governments, 1230 Highmarket Street, Georgetown, SC 5:00PM-7:00PM
3. **December 17, 2024**, Town of Ocean Isle Beach Town Hall, 111 Causeway Drive, Ocean Isle Beach, NC 12:00PM-2:00PM
4. **December 17, 2024**, City of Myrtle Beach Train Depot, 851 Broadway Street, Myrtle Beach, SC 5:00PM-7:00PM

Public Meeting 2 Locations





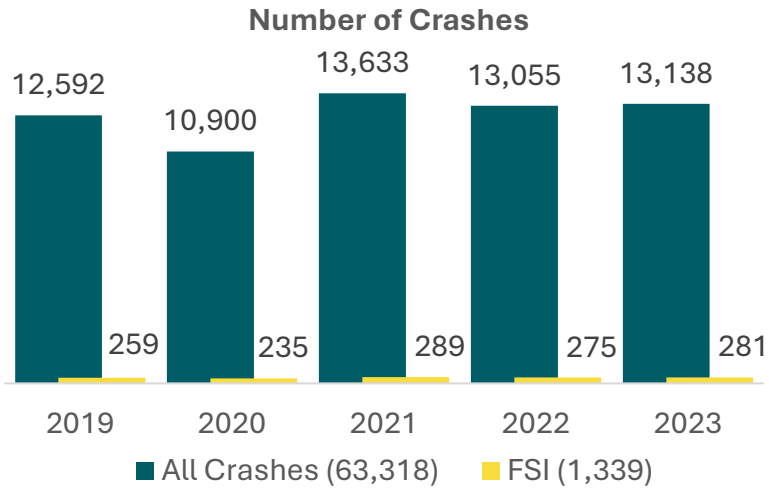




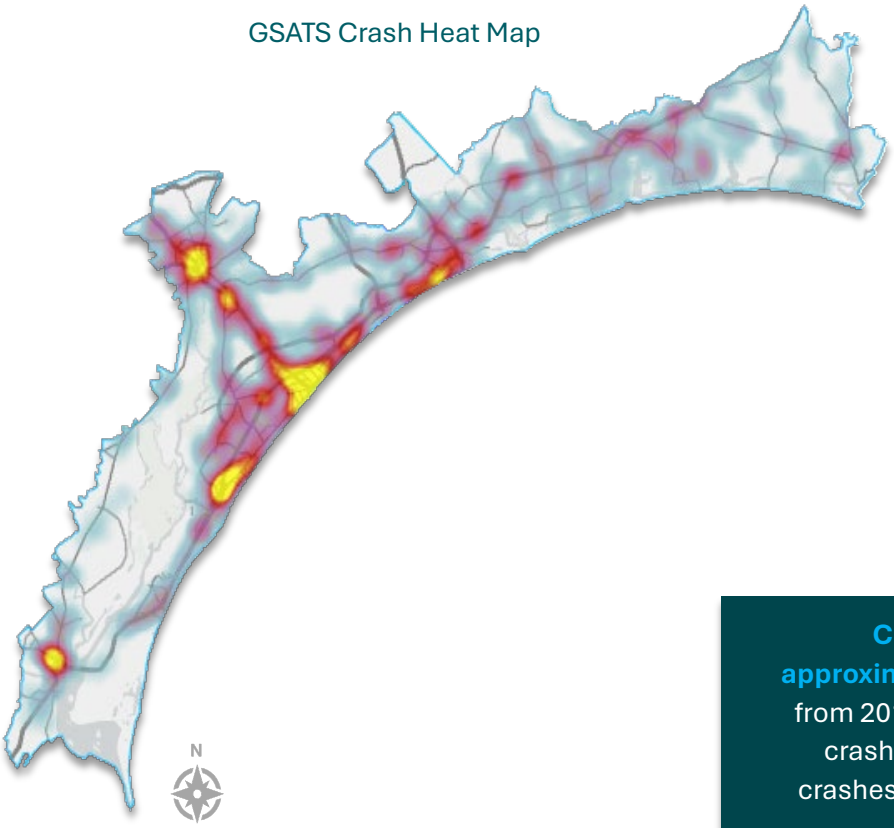
4.0 Crash Analysis

An analysis of crash data from SCDOT and NCDOT in the GSATS area from the 5-year period between 2019-2023 was reviewed to assess patterns and trends within the crash data. The analysis focused on the crash types, contributing factors, current conditions, and locations for fatal and serious injury crashes (FSI). Additional crash data summaries have been provided in **Appendix D**.

The crash trends identified at this stage of the analysis form the baseline conditions necessary to develop a toolkit of countermeasures to address the predominant crash factors contributing to crashes in the GSATS region. The toolkit includes safety countermeasures with proven and measurable tactics to improve safety. While the baseline of considerations are established with the initial crash analysis, additional factors are assessed for inclusion in the toolkit based on factors discussed in the following sections of this report and those identified by the public and stakeholders that may not be captured by data analysis alone. More information on the toolkit is discussed in Section 7 Safety Action Plan Implementation.



GSATS Crash Heat Map



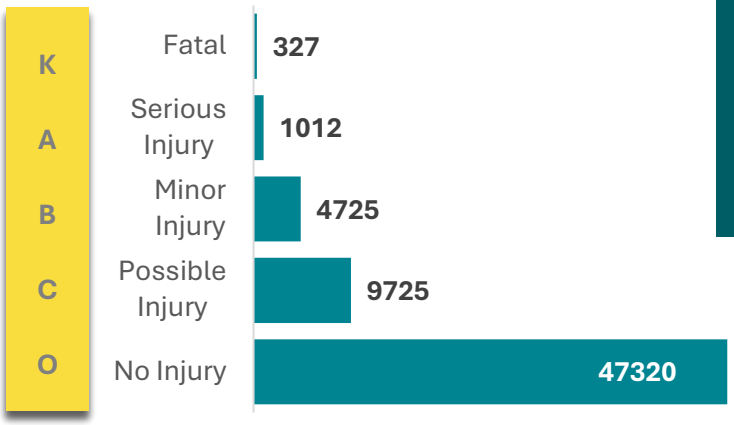
Crash History

There were 63,318 crashes in the GSATS area during the study period with 1,339 recorded with a fatality or serious injury involved. Crashes commonly involve multiple persons, so the total number of fatalities and serious injuries were higher than the number of FSI crashes. During the study period, there were 346 fatalities and 1,919 serious injuries. Predominant crash types indicate that intersection awareness, access conflicts, roadway departure, bicyclists and pedestrians, and speed were factors.

Crashes during the study period equate to approximately 1.3 fatalities per week. Crash data from 2019 to 2023 shows an increase in number of crashes beginning in 2021. The severity of those crashes has also resulted in an increasing number of fatalities in the same timeframe.

Crash Severity

A crash severity classification system was developed by FHWA known as the KABCO Injury Classification Scale to indicate the scale of the crash by incident. The following graph identifies the crash severity for the GSATS region during the study period. NCDOT and SCDOT define a fatality as one that results in death within 30 days after a crash. Serious injuries include severe lacerations, broken or crushed extremities, significant burns, and those causing a loss of consciousness when taken from the crash scene.



Note: 209 crashes coded as "Unknown"

Crash Factors

Crash reporting includes the crash type plus two indicators that provide additional insight into the crash circumstances: the most harmful event and probable cause. The summary to the right focuses on FSI crashes during the study period and the highest rated probable causes indicated by the crash data. Not all categories are shown.

Most Harmful Event	
Motor Unit	315
Bicycle/Pedestrian	211
Fixed Object	196
Roadway Departure	164
Vehicle Malfunction	113

Probable Cause

Motor Vehicle in Transport

Failure to Yield	43%
Speed/Speeding	12%
Alcohol/Drug	11%
Failure to Obey Sign/Signal	11%

Bicycle/Pedestrian

Lying or Illegally in Roadway	33%
Improper Crossing	17%
Alcohol/Drug	12%
Failure to Yield	11%

Fixed Object

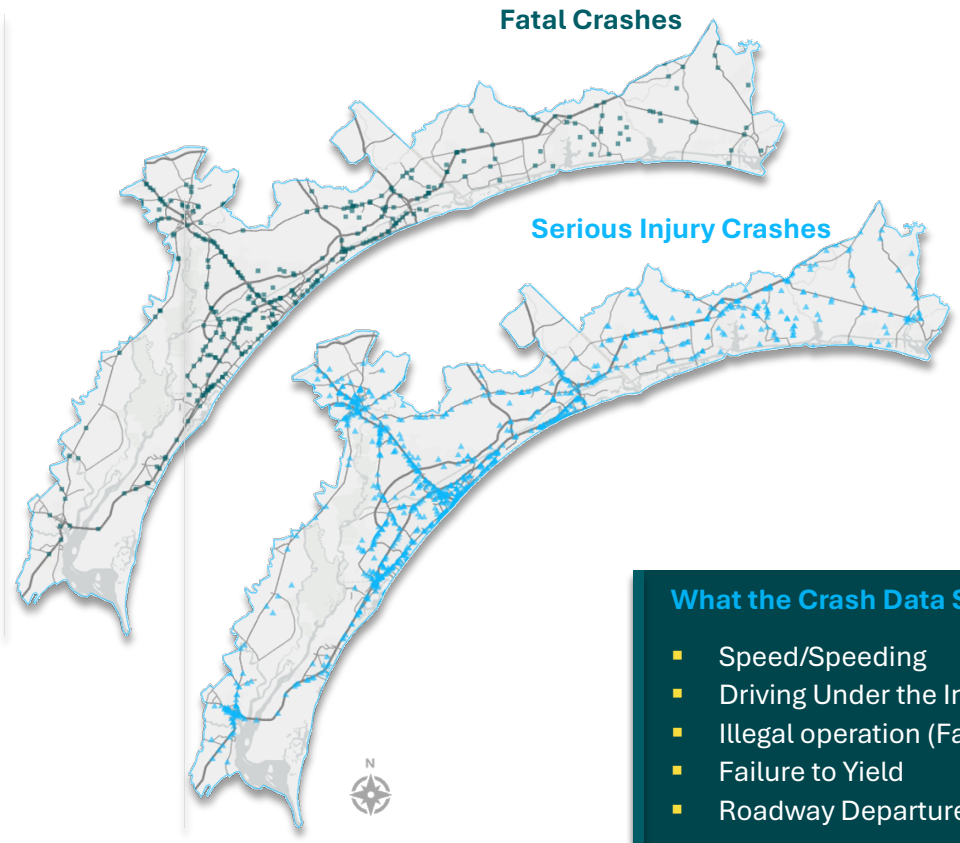
Speed/Speeding	35%
Alcohol/Drug	26%

Roadway Departure

Speed/Speeding	38%
Alcohol/Drug	28%

Vehicle Malfunction

Speed/Speeding	36%
Failure to Yield	28%
Alcohol/Drug	12%



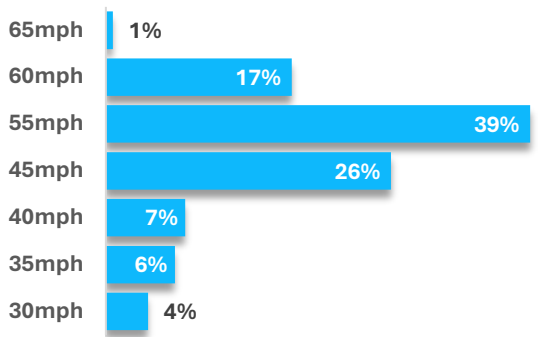
What the Crash Data Says About FSI Crash Factors:

- Speed/Speeding
- Driving Under the Influence
- Illegal operation (Failure to Yield or Illegally in Roadway)
- Failure to Yield
- Roadway Departure

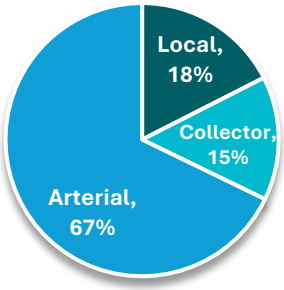
Crash Environment

Ancillary crash data was compiled to assess the environmental and other circumstantial conditions indicated by the FSI crash data. This information features the road surface conditions, light conditions, day of the week, junction type, speed limit, and functional class from the crash records. This data shows nighttime crashes and those on unlit roadways comprise about half of the crashes, the number of crashes is elevated on the weekend, more crashes are occurring on roadways with speeds 45 mph and over, and the most crashes are on arterial roadways.

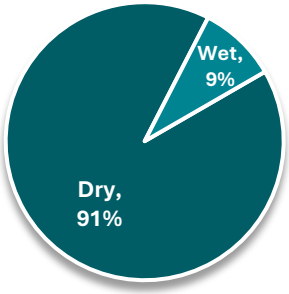
Speed Limit



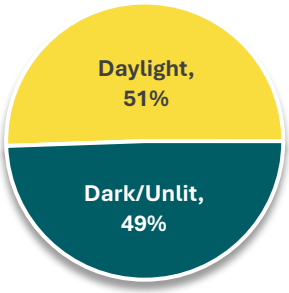
Functional Class



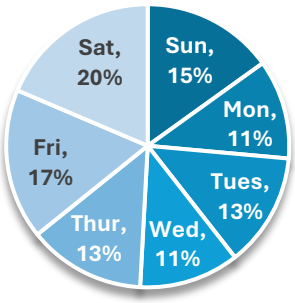
Road Surface Conditions



Light Conditions



Day of the Week

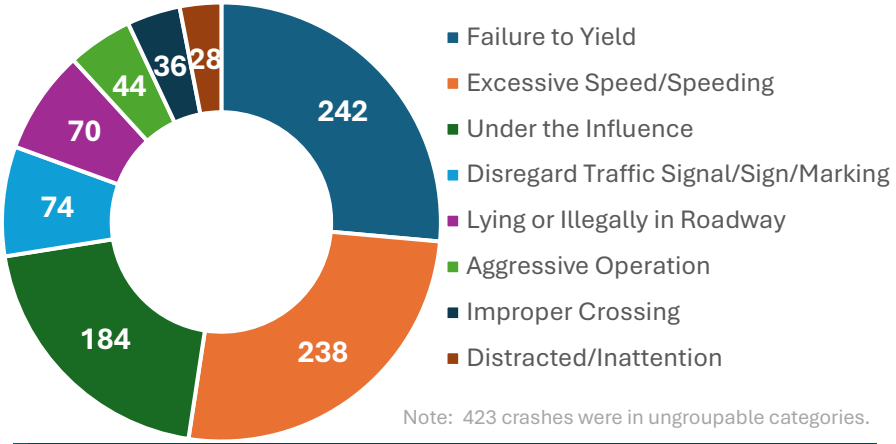


Driver Behavior

Driving behaviors can be identified in crash records indicating risky driving practices are an element to consider either for physical safety improvements or educational, awareness, and/or policy changes.

Aggressive driving, tailgating, driving too fast for the conditions, distracted driving, inattentiveness, driving fatigued, and operating a vehicle under the influence are risky driving behaviors that contribute to crashes. There are other circumstances such as running red lights, failure to obey a stop sign, failure to yield the right of way, disregarding signage or road marking, and mechanical issues that have been documented in crash records for the study period. These may be direct or indirect traffic violations, but are contributing factors that may be addressed by collective or targeted safety strategies.

Driver Behavior by Crash



Note: 423 crashes were in ungroupable categories.

What the Crash Data Says About FSI Crash Cause and Conditions:

- Poor Lighting
- Arterial Roads with Higher Speeds
- Intersection Awareness
- Improper Crossing
- Driving Under the Influence

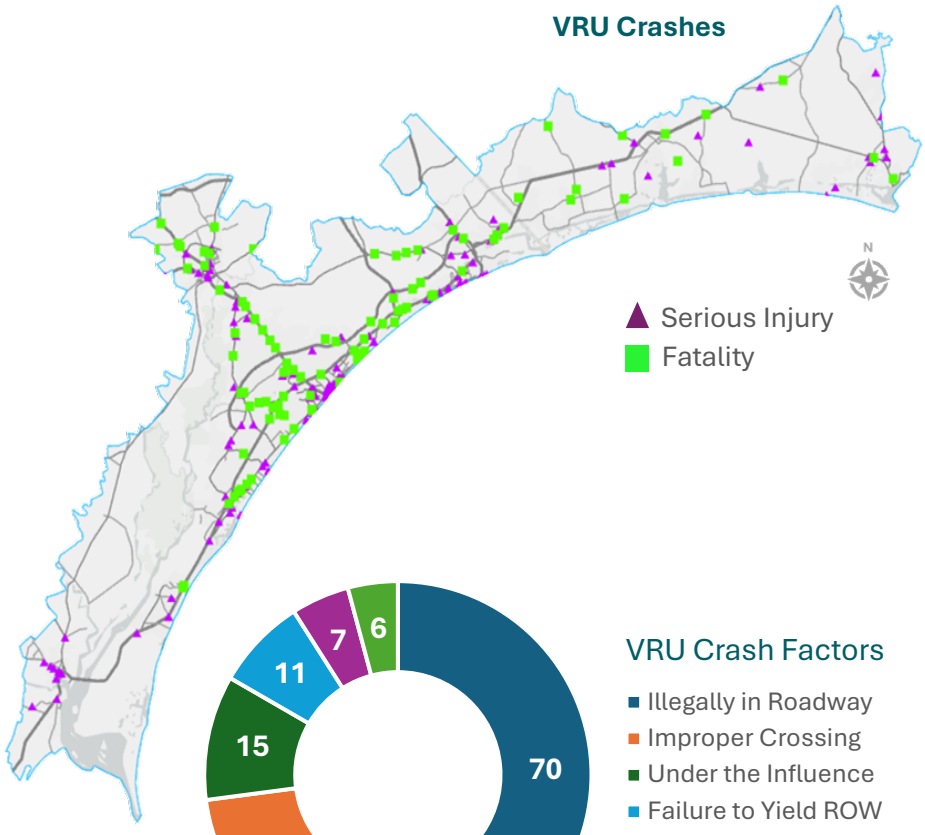
Vulnerable Road Users

VRU FSI Crashes				
2019	2020	2021	2022	2023
24	30	42	51	50
7	10	8	4	12

Vulnerable Road Users (VRUs) include pedestrians and bicyclists. VRUs are most susceptible to serious injuries and fatalities when involved in crashes with a motor vehicle. There were 1,047 VRU related crashes during the study period including 238 fatal and serious injury crashes. Of those, 99 were fatalities. GSATS used an overlay of the CoastRTA transit routes and stops, sidewalk network, multi-use paths, boardwalk, bike lanes, and trails to aid in this evaluation. Additional context in this region factors in coastal tourism and attraction/destination points on the roadway network fronting the coastline, which is densely populated with beach resorts, restaurants, and shopping.

The CoastRTA overlay examined fatal and serious injury crashes within 50 feet of a designated transit stop. There were 18 crashes within proximity of a transit stop with characteristics worth noting. Of the crashes, there were three fatalities, and 22 serious injuries. One fatal crash had 2 additional serious injuries. Another crash resulted in two fatalities and one serious injury. These crashes were attributed to speeding and disregarding signs/signals. Many of the crashes occurred at night, indicating lighting may have been a contributing factor.

There were 53 crashes within the vicinity of or related to multi-use paths and bike lanes. There were 8 fatalities and 75 serious injuries reported where speeding, lack of light, and intoxication were contributing factors.

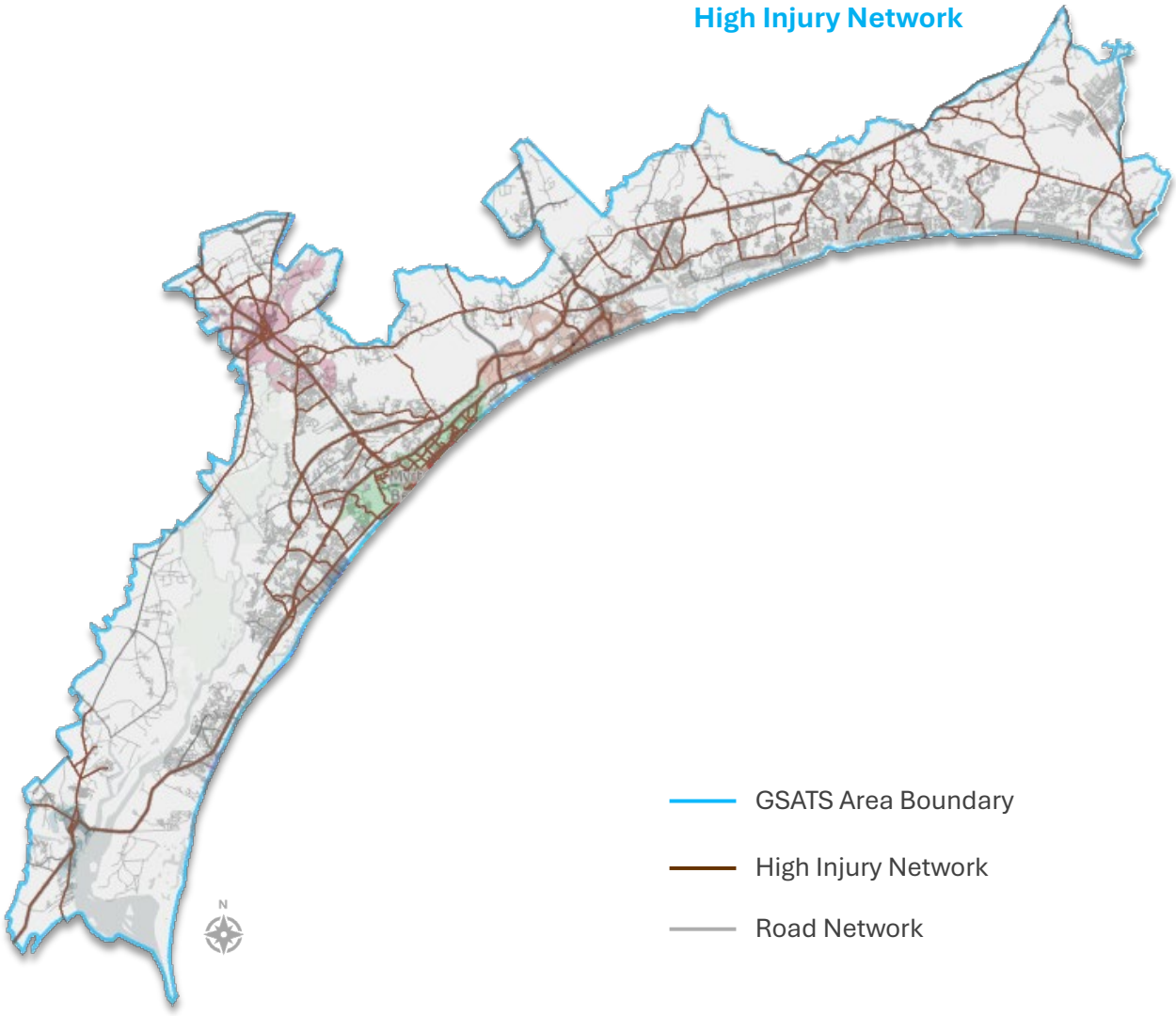


What the Crash Data Says About FSI VRU Crashes:

- Illegally in Roadway
- Improper Crossing
- Poor Lighting
- Speed/Speeding
- Under the Influence

Note: 44 crashes were in ungroupable categories.

5.0 Safety Analysis



Vision Zero planning approaches emphasize engineering, education, enforcement, and policy related countermeasures to address the three key elements of the road system that typically determine the trauma level in a collision: road, vehicles, and speed. This data is quantified and visualized using crash data and mapping of the crash location, cause, and crash context (i.e., land use, intersection, rural area).

By the Numbers

4,665 Miles – The number of roadway miles in the GSATS SAP network
744 Miles – The number of roadway miles in the High Injury Network (HIN)
15.9% - Percentage of the GSATS roadway miles in HIN
82% - Percentage of FSI crashes on the HIN

High Injury Network

The High Injury Network (HIN) was developed using crash data from 2019-2023 for the GSATS region and maps roadway segments where the highest concentration of all fatal and serious injuries occurred along a subset of the roadway network. The HIN represents roughly 16% of the overall transportation network but captures nearly 82% of the overall FSI crashes. The HIN aids in the identification of higher crash frequency and severities where the greatest potential for safety improvements can be expected with the application of appropriate safety countermeasures.

An interactive view of the crash data can be found on the SAP dashboard on the agency website.

GSATS	Total Roadway Miles	Total Crashes	Total HIN		
			miles	% of total mileage	% of FSI Crashes
2019-2023 Crash Data	4,665	63,318	744	16%	82%

The GSATS region had 1,339 fatal and serious injury crashes over the five-year study period. The roadway network was divided into segments to evaluate the number of FSI crashes per segment and examine the context for crashes to determine the segments with the greatest need for safety improvements. This SAP identifies 10 intersections and 11 corridors for priority implementation as determined by the data, project team, steering committee, and the public. Project selection and methodology are detailed in Section 7 Safety Action Plan Implementation.

The GSATS HIN was developed at a regional level covering the expanse of the MPO service area. There are three counties, and 15 municipalities represented by GSATS and included in the SAP. The region ranges from rural to densely populated urbanized with year-round tourism. Addressing safety includes an examination of the featured location, identifying the relationship between the context and the crash factors, and matching solutions to suit both.

From the crash analysis, an evaluation of the crash types and circumstances has emphasized the type of improvements that should be considered as part of the improvement and countermeasures toolbox. This data is translated into a graphical depiction of FSI crash locations to aid in the identification of potential improvement locations and to examine the context of where crashes occur.

45% Crashes occurred on US/State arterials in urbanized areas.

38% Crashes classified as "Non-Collision" include bicycles and pedestrians and roadway departures. These crashes were primarily attributed to speed and UI.

27% Of crashes were angled crashes at 4-way intersections, T-Intersections, and access points where motorists failed to yield.

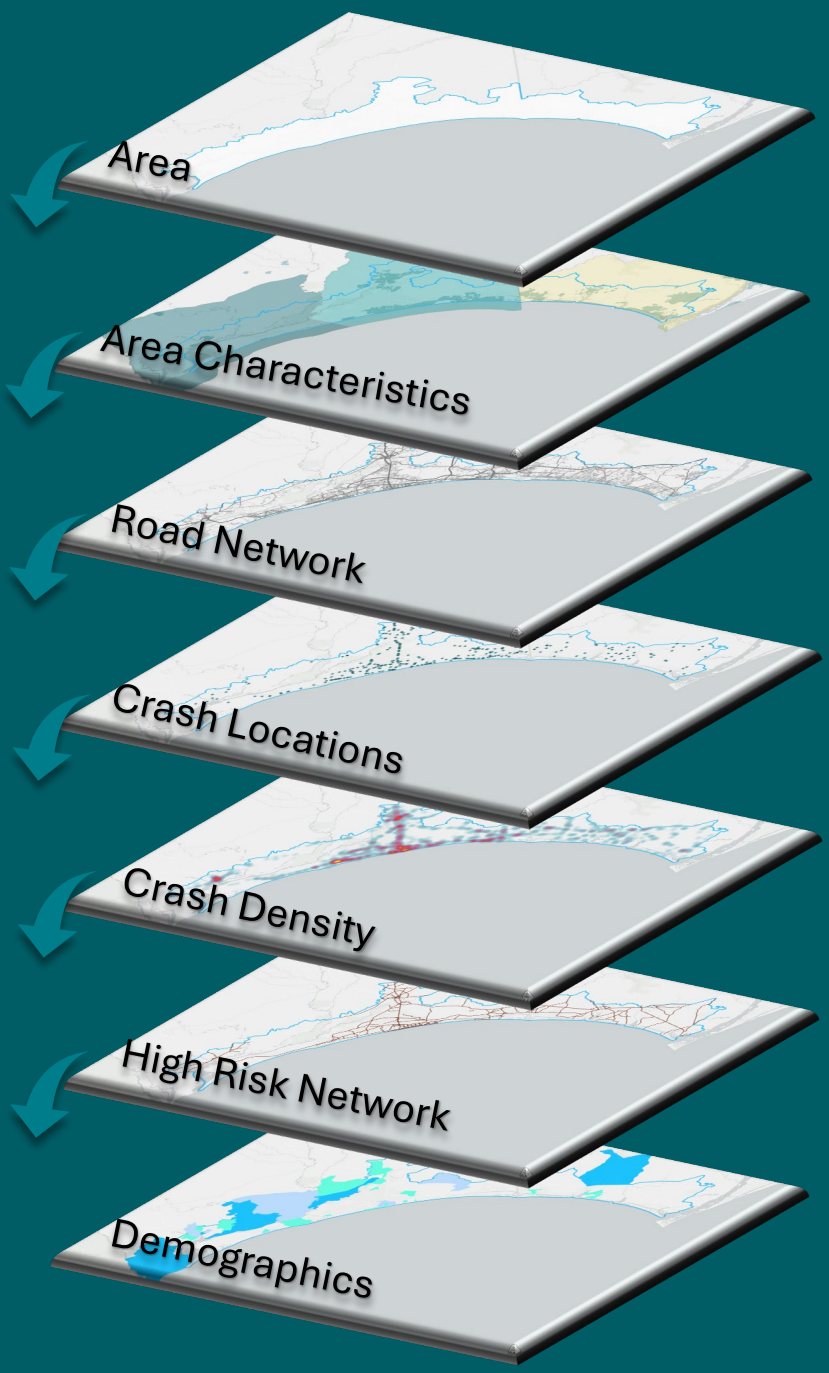
17% Of bike/ped crashes were lying or illegally in roadway or crossing improperly at non-junctions.

10% Of rear end crashes were primarily at non-junction locations in urbanized areas. Speed and UI were contributing factors.

Considerations and Context

Additional mapping overlays were included in the safety analysis and part of the examination and prioritization of projects selected for spot, corridor wide, and systematic improvements. These overlays are available in the form of an interactive Geographical Information System (GIS) dashboard. Overlays include the bicycle and pedestrian network, transit stops and routes, Justice 40 Environmental Justice census tracts from CEJST, and hospital locations. This resource will aid future project prioritization and selection and SAP progress monitoring.

Geographic Information System (GIS) for Safety Analysis



Geographic Information Systems (GIS) are used to analyze crashes and visualize data on maps. Crash data contain tabular form details about crashes (date, time, conditions, type, speed limit, etc.) and the location of the crash (latitude, longitude, road type, road characteristics, intersection, etc.). GIS software is used to generate spatial visualizations of the crash data set.

GIS mapping is constructed by compiling and stacking layers of information. Layers can be linked, connected, and filtered to drill down on targeted information. GIS integrates the crash data set with cause, location, and context information to aid in the identification of the high risk networks and hot spots. This spatial analysis can reveal patterns and trends that would not be apparent from tabular data alone.

Additional and pertinent layers can also be added and evaluated in context with the high risk network to aid in equity assessments, multimodal linkages, educational institutions, emergency services, and other area characteristics that aid in the safety analysis.

The spatial analysis capabilities of GIS provide flexibility for complex computation for system wide, corridor, and hot spot crash data analysis. Leveraging the computational power of GIS comprehensive analysis of the various factors contributing to crashes can be assessed. This advanced analysis facilitates the development of targeted mitigation practices aimed at preventing and eliminating crashes.

GSATS has made this information accessible to the public via the dashboard published on the agency website. The dashboard is an interactive tool that includes options to toggle layers, view crash data and analytics, and view project information for this Safety Action Plan.

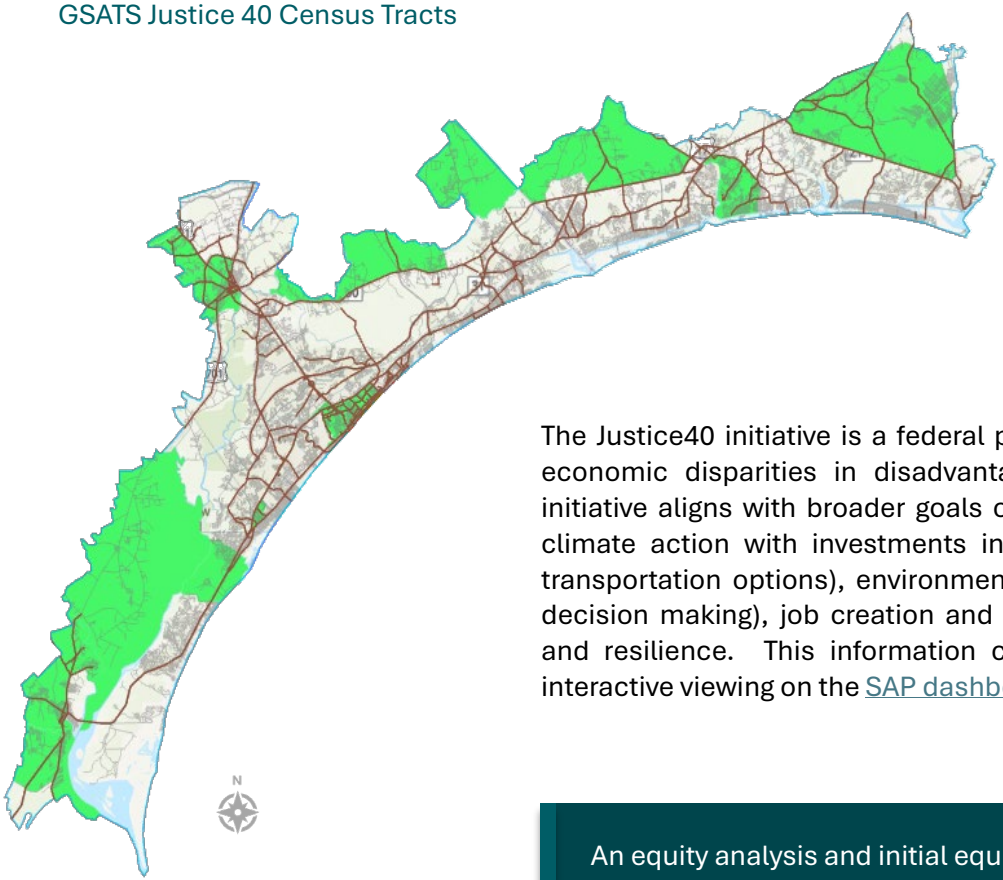
Equity Overlays

To evaluate whether collisions were disproportionately affecting one community over another, the HIN roadway miles included in the minority and low-income areas were calculated from the US Census Bureau and dated May 2022.

GSATS Equity Overlay	HIN Miles	Total Roadway Miles
Low Income	90	590
Minority	59	360
J40	73	509

Title VI of the 1964 Civil Rights Act and Executive order 12898 on Environmental Justice mandates that "each federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." The geographic distribution of minority and low-income populations was identified in the GSATS MTP as per the guidelines outlined by the Council on Environmental Quality (CEQ). The CEQ advises identifying areas where the minority and low-income populations (1) exceeds 50 percent or (2) is "meaningfully greater" than the local neighborhood population. In the GSATS area, minority and low-income populations were determined by identifying those census block groups that have a higher percentage of those populations than the regional average.

GSATS Justice 40 Census Tracts



The Justice40 initiative is a federal policy to address environmental and economic disparities in disadvantaged communities. The Justice40 initiative aligns with broader goals of equity, environmental justice, and climate action with investments in clean energy infrastructure (clean transportation options), environmental justice considerations (inclusive decision making), job creation and workforce development, and health and resilience. This information can be accessed for improved and interactive viewing on the SAP dashboard.

An equity analysis and initial equity impact assessment of proposed projects and strategies included in Section 7 Safety Action Plan Implementation will advance the understanding of project impacts.

6.0 Policies and Strategies

To address safety in the GSATS area, it is essential to build upon the culmination of information gathered and formulate a comprehensive approach involving policy, engineering, education, and enforcement strategies. The GSATS area is expansive to include two states, three counties, and many municipal jurisdictions. This Safety Action Plan has been prepared as a resource for use by varying levels of government in implementing projects that improve safety for all users. This high-level view is intended to provide a framework for a wide range of uses to guide, select, prioritize, and track transportation investments. The following considerations have been compiled as a construct of resources and current practices that can be utilized for collaboration and application across the region.

Policy

- **Regulations and Legislation**: Implementing laws and regulations that promote road safety, such as stricter DUI laws, lower speed limits in high-risk areas, and mandatory seatbelt use.
- **Planning and Zoning**: Developing policies that support safer road designs, such as complete streets policies that accommodate all users, including pedestrians and cyclists.
- **Funding and Resources**: Allocating funds for safety improvements and ensuring resources are available for ongoing maintenance and enforcement.

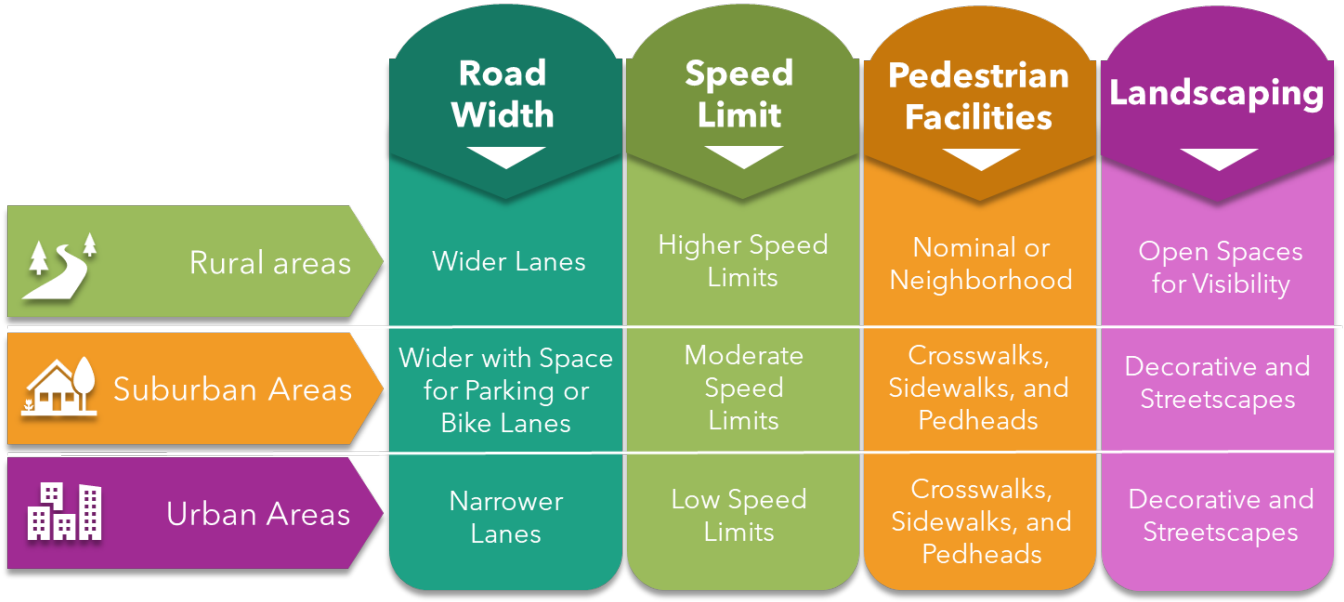
Policy

A review of the current policies and strategies in the GSATS area was conducted as part of the Safety Action Plan to identify potential connections and gaps for future consideration and implementation. A matrix of the strategies in place and oversight committee or advisory board responsible for the oversight of each has been provided in **Appendix B**. There is also a list of the strategies with demonstrated success. The list of successful strategies highlights overlapping safety areas, allowing for the development of policies and strategies that advance multiple initiatives in one resource.

The GSATS MTP outlines recommendations for active transportation facilities to include the development of active transportation design policies, protected intersection guidance, and transportation demand management plans for schools. Specific elements mentioned for an active transportation design policy include separate facilities, paved shoulders, rumble strips, bridges, signage, and lighting. GSATS affirms its commitment to safety and programming projects to advance the Transportation Performance Measures (TPM's) for safety in the Transportation Improvement Program (TIP) by adopting the statewide safety targets established by SCDOT and NCDOT. The GSATS Congestion

Mitigation Process (CMP) also identifies strategies that will improve safety by improving traffic operation and reducing delay, which are often contributors impacting red light running, speeding, distracted and aggressive driving. GSATS adopted a complete streets policy as part of the 2040 MTP update.

This policy review identified overlapping strategies and recommendations in the library of GSATS documentation that align with Target Zero and Vision Zero strategies, are data driven, include prioritization criteria, and follow up evaluation. One such policy could expand on the existing Horry County Traffic Calming Program Policy to include additional measures such as chicanes, bulb-outs, road diets, and curb extensions.



A Speed Management Action Plan should be developed and implemented to establish a mechanism for regular review of existing speed limits in areas where speed and speeding are problematic. FHWA's Speed Management Toolkit and Speed Management Action Plan Template provide guidance and technological resources to develop a Speed Management Action Plan.

Principal Arterials (Urban, Suburban, Rural) – 35-55 MPH
Minor Arterials (Urban, Suburban, Rural) – 30-45 MPH
Collectors (Urban, Suburban, Rural) – 25-35 MPH
Local Roads (Urban, Suburban, Rural) – 20-30 MPH

A framework for the Safe Routes to School (SRTS) Programs should be developed and distributed to schools as an outline for the criteria and efforts required to apply for funding for improvements. This plan should explain and outline the process for conducting safety audits, collecting data, and application guidance for use at the local level.

Currently in South Carolina, red light and speed cameras are not authorized by state law (see *Article 5 Obedience to and Effect of Traffic Laws Section 56-5-710*). Speed violations are captured by law enforcement with radar or LIDAR detection devices. Red light running is captured by observation. In North Carolina, the use of traffic cameras for automated enforcement is governed by General Statues Chapter 160A, Article 15, Section 300.1, which also authorizes the use of automated enforcement for municipalities. Violations and penalties are assessed according to the criteria outlined in the legislation. Public outreach indicates an interest at the local level for these devices to be installed for enforcement, but without legislative action, this policy may not be implemented.

Safe System Approach to Speed Management

1. Data Collection and Analysis

- **Crash Data:** Collect speed related crash data to include location, severity, lighting conditions, pavement conditions, collision type, functional class, context, date, most harmful event, and probable cause for a specified window of time.
- **Traffic Data:** Gather information on traffic volumes, speeds, and road conditions.
- **Analysis Tools:** Use mapping tools like GIS to identify crash locations, establish a HIN, and assess trends and densities. Use analysis tools such as pivot tables, charts, and tables to summarize findings.
- **Other Inputs:** Tools such as the NCHRP 966 or USLIMITS2 analysis packages require specific inputs for successful analysis and operation. A list of inputs should be compiled to meet these specifications and may require additional data resources and collection.

2. High-Risk Areas

- **Hot Spot and Corridor Identification:** Identify locations and corridors with a high frequency of speed-related crashes.
- **Risk Factors:** Analyze factors that contributed to crashes such as road design, traffic flow, driver behavior, and users or operators such as VRU, motorcycles, transit.
- **HIN:** Use crash data or existing analysis to compare the high-risk areas to the HIN.
- **Prioritize:** Prioritize improvements and implementation in areas with the highest risk with an emphasis on equity.

3. Intervention Strategies

- **Engineering:** Use the speed management toolkit, speed studies, context sensitive speed strategies, traffic calming measures, signage, and the Safe System Approach to devise solutions.
- **Education:** Deploy public awareness campaigns to encourage safe driving behavior. These may be targeted to audiences where crash patterns indicate targeted campaigns such as senior and teen drivers.
- **Enforcement:** Utilize targeted or blanketed enforcement strategies to enforce speed limits in high-risk areas.

4. Monitoring and Evaluation

- **Performance Metrics:** Establish evaluation metrics for solutions based on the reduction in speed related crashes and crash severity.
- **Monitoring:** Establish a review and/or evaluation process to regularly assess speed management applications and plans.

5. Reporting and Communication

- **Transparency:** Utilize agency website to keep the public informed about speed management efforts, policies, enforcement, and outcomes.
- **Stakeholder and Public Engagement:** Engage with the public, stakeholders, and law enforcement to collaborate and communicate on the approaches most important to them. Include targeted outreach efforts to capture input from underserved and disadvantaged communities.

The GSATS area experiences year-round tourism, which results in an increased use of golf carts, scooters, and mopeds around the resort and beach areas. South Carolina Code Section 56-2-105 authorizes the permit and insurance requirements allowing for limited use of golf carts on secondary highways and streets within a specified distance of the origin during daylight hours by licensed operators over the age of 16. Golf carts are not allowed on multipurpose paths and sidewalks in the City of Myrtle Beach. In North Carolina, a model ordinance was developed by NCDOT to aid in the adoption of policies by counties, towns, and cities. Brunswick County Ordinance Chapter 1-7, Article V outlines the permitting, insurance, and operational requirements for golf cart operation. North Carolina Code Section 160A-600.6 provides the provisions for localities to adopt golf cart policies. Public feedback indicated that there should be an expansion of the golf cart policies to designate the number of passengers allowed on these vehicles.

Overall, GSATS area municipalities and Counties without current programs and policies in place should establish complete streets policies with standardized traffic calming guidance, speed management plans, and SRTS guidance to advance the implementation of safety initiatives throughout the GSATS region. Standardizing these policies with a framework for local use and implementation would encourage system-wide adoption as a blueprint with uniform layout. Depending on staff availability and agency coordination required to develop these policies, the timeframe for implementation could range from between 1-5 years.

Engineering Policy

- **Road Design Improvements:** Redesigning intersections, adding roundabouts, and improving road signage to reduce conflict points and enhance visibility.
- **Access Management Plan:** Implementing access management to maintain traffic progression, consolidate driveways, and improve safety.
- **Traffic Calming Measures:** Implementing speed humps, chicanes, and curb extensions to slow down traffic in residential and high-pedestrian areas.
- **Pedestrian and Bicycle Infrastructure:** Building sidewalks, crosswalks, bike lanes, and multi-use paths to provide safe routes for non-motorized users.

Engineering Policy

Engineering road design improvements are discussed in Section 7 Safety Action Plan Implementation. Recommendations to address traffic calming measures, access management, and VRU infrastructure can be applied system-wide, in combination with a series of countermeasures or as stand-alone solutions. Certain types of countermeasures can be pre-approved by jurisdictions to streamline the project planning and design process. These countermeasures can serve as the basis for engineering design and guidance to address safety throughout the region. Features of the toolkit include roadway design elements, but also dynamic awareness mechanisms such as speed displays and warning signage.

Establishing access management standards for adoption by the municipalities and/or counties in the GSATS area to address signal spacing, signal operations, median openings, number of driveways, driveway design, driveway linkages, backside access, acceleration/auxiliary lanes, deceleration lanes, and retrofitting existing driveways would bolster the implementation of access management discussed in the toolkit. An example of the best practices for implementing access management was included in the GSATS Highway 17 Corridor Study. Additional information for Speed Management, Pedestrian and Bicycle Safety, Roadway Departure mitigation, Intersection, and other engineering applications can be found in FHWA's Proven Safety Countermeasures. Timeframes for implementation of these countermeasures are dependent on many factors that will be established as local preference, prioritization, and matching funds are identified.

GSATS was proactive and responsive to feedback from a meeting with Emergency Services personnel at the start of the Safety Action Plan where the need for signal preemption was discussed. GSATS was awarded a Safe Streets and Roads for All Demonstration Grant in November 2024 to install and activate EVP in Horry County, which will connect with the systems already active in Myrtle Beach and Georgetown County. More information can be found in **Appendix E**.

Education Policy

- **Public Awareness Campaigns:** Conducting campaigns to educate the public about safe driving practices, the dangers of distracted driving, and the importance of sharing the road.
- **School Programs:** Implementing safety education programs in schools to teach children about pedestrian and bicycle safety.
- **Driver Training:** Offering defensive driving courses and other training programs to improve driver behavior and awareness.

Education Policy

Educational campaigns to improve safety were included in the public feedback and are currently utilized in the GSATS area. These include several Division of Motor Vehicles (DMV) approved driving schools in South Carolina in support of the licensing requirements for drivers in the state. In North Carolina, the DMV offers The Parent's Supervised Driving Program curriculum as an aid to the licensing requirements for new drivers. AARP offers a Smart Driver Course designed especially for drivers age 50 and older. Public awareness for areawide visitors should continue to be prioritized to improve safety with signage, billboards, websites, discount magazines, and social media targeting pedestrian and bicycle safety, distracted driving, speeding, seat belt use, and DUI. Data has shown that roads closest to the beach areas in Myrtle Beach and North Myrtle Beach have the highest VRU crashes and would benefit from educational campaigns to improve crossing awareness. These practices could be implemented in the short term (1-6 years) in concert with campaigns already in place to include distracted driving deterrence, impaired driving awareness, golf cart awareness, motorcycle awareness, bicycle and pedestrian awareness, and seatbelt safety.

Enforcement Policy

- **Law Enforcement:** Increasing police presence and enforcement of traffic laws, such as speeding, DUI, and seatbelt use.
- **Automated Enforcement:** Using red light cameras, speed cameras, and other automated systems to deter violations and capture offenders.
- **Penalties and Fines:** Implementing strict penalties for traffic violations to discourage unsafe behaviors.

Enforcement Policy

Enforcement strategies align with those policy related strategies that authorize law enforcement to pursue and penalize violations. Law enforcement agencies may also assist with campaigns to ensure proper child restraint and seat belt usage. High visibility enforcement strategies are used by law enforcement to target driver behaviors by publicized campaigns in high-risk areas. These strategies may be implemented in the immediate future.

7.0 Safety Action Plan Implementation

This Safety Action Plan follows the guidance from USDOT's SS4A Components document and FHWA's Self-Certification Eligibility Worksheet to establish a framework for the implementation of the projects identified in this plan and for safety needs and future projects identified by the counties and municipalities in the GSATS region to uses as a basis to make improvements. Supporting documentation has been compiled into a publicly available and interactive mapping and data resource dashboard. The dashboard is equipped with the crash data (including VRU), public input, low income, minority, and Justice 40 areas, active transportation network, HIN, and transportation network to enable project identification, prioritization, safety needs, and equity considerations to be gathered and systemwide countermeasures from the toolkit to be applied. The GSATS Safety Action Plan is publicly available on the agency website along with the SAP Dashboard at https://gsats.org/.

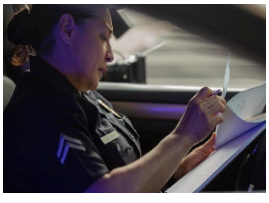
Safety Action Plan Toolkit

The following section provides a variety of engineering strategies to address safety needs identified in the GSATS region. Strategies were developed in consideration of the crash history and trends, high-risk locations, context, and feedback from the public. FHWA has developed a list of Proven Safety Countermeasures that are effective in reducing FSI crashes by safety focus area. These countermeasures have quantifiable benefits or Crash Reduction Factors (CRFs), which project the safety impact of implementation. The countermeasures selected for implementation are context appropriate and may be implemented system-wide, as stand-alone treatments, or combined with multiple countermeasures to improve safety for all road users.

As discussed in Section 4 Crash Analysis and Section 5 Safety Analysis of this report, context is an important factor in determining the appropriate countermeasures for application. The Crash Analysis uncovered the high frequency crash types, contributing factors, functional class, environmental conditions, driver behaviors, and transportation modes documented for crashes during the study period. The Safety Analysis mapped this data to aid in the identification of the HIN per roadway segment and with FSI frequency. Mapped data aided in the identification of roadway types, roadway cross sections, traffic volumes, surrounding land use, posted speeds, and equity considerations captured by the HIN. From this information, countermeasures were developed to address the most significant patterns contributing to FSI crashes. Countermeasures are provided in two separate lists for applications on corridors and intersections.

Countermeasure treatments vary by context. Treatments applicable on a rural two-lane road are not necessarily applicable to an urban five-lane road. Therefore, a toolkit of countermeasures was developed to aid in the identification of appropriate safety measures and menu of treatments for consideration when determining the safety benefit, expediency, and potential cost of treatments to improve safety. The toolkit has been provided in **Appendix F**.




- **Roadway Departure Countermeasures**
- **Traffic Control Device Upgrades**
- **Cross Section Modifications**
- **Signal Upgrades**
- **Access Management Strategies**
- **Intersection Upgrades**
- **Non-Motorized Enhancements**

Engineering Strategies

Roadway Departure Countermeasures

Roadway departure crashes occur when a motorist leaves the travel lane by crossing the edge line, center line, or roadway. These incidents typically start with a single vehicle exiting the lane and often result in collisions with fixed objects like guardrails, trees, or ditches, or with other vehicles. In the GSATS area, the primary causes of these crashes are driving behaviors such as speeding and impaired driving. To improve safety, countermeasures include education, enforcement, and engineering designs. Traffic calming policies and designs that create self-enforcing roadways can help reduce speeds and speeding. These roadways use visual cues, such as vertical and horizontal deflections, to naturally encourage drivers to adhere to posted speed limits. Additionally, advanced warning signage, signaling, radar feedback systems, and overhead lighting can help reduce speed-related crashes. High-visibility enforcement, which involves well-publicized and targeted patrols with a noticeable law enforcement presence, is another effective strategy to curb speeding and impaired driving. These countermeasures are applicable to urban, suburban, and rural areas across all functional classes of roadways. More information can be found in **Appendix F**.

Potential Countermeasures

- Widen Shoulders
- Resurfacing
- Advanced Warning Signage and Signals
- Add/Improve Overhead Lighting
- Rumble Strips/Stripes
- Wider Edge Lines
- Radar Speed Feedback Systems

Traffic Control Device Upgrades

Upgrades to signal technology, advanced warning systems, phasing optimization (including VRU signal timing), Emergency Vehicle Preemption (EVP) controllers, and signage improve safety for all users. Upgrades to signal timing to improve operations and clearance times enhance the efficiency and safety of intersections. Phasing modifications can include protected phasing for turning vehicles. Improving signal head visibility with backplates or additional signal heads provide additional measures for intersection awareness. Phasing for pedestrians, ensures that traffic signals are timed to minimize conflicts and enhance safety for all users. Phasing can include leading pedestrian intervals, dedicated pedestrian phasing, and concurrent pedestrian phasing. EVP systems provide green signal priority for emergency service vehicles to clear intersections prior to their arrival and improve safety from conflicts.

Separate from signals, advanced warning systems alert drivers to upcoming hazards or changes in road conditions, providing them with more time to react appropriately. Clear and well-placed signage provides essential information to drivers, helping them navigate safely and make informed decisions on the road. Signage may include rapid flashing beacons or LED borders to emphasize attention to the alert. Together, these upgrades create a safer and more efficient transportation environment for everyone. These types of countermeasures will improve safety at junctions in the GSATS area. It should be noted that GSATS was awarded a Safe Streets and Roads for All Demonstration Grant in 2024 to install and activate EVP in Horry County to include North Myrtle Beach, and Conway, which will connect with the systems already active in Myrtle Beach and Georgetown County. More information can be found in **Appendix F**.

Potential Countermeasures

- Optimize Signal Phasing and Clearance Times
- Add/Improve Signal Heads
- Advanced Warning Signage and Signals
- Install/Improve Overhead Lighting
- Dedicated/Optimized Pedestrian Signal Phasing
- Install Pedestrian Signal Heads (Pedheads)
- Install Rectangular Rapid Flashing Beacons (RRFB)
- Add Protected Signal Phasing for Turning Movements




Cross Section Modifications

Cross section modifications enhance safety by incorporating geometric changes to reduce or improve collision conflict points, alter conflict angles, add or improve pedestrian and bicycle facilities, and lower speeds. Applications include road diets or lane reductions, adding or improving medians, and adding or improving facilities for VRUs. Cross section modifications can include traffic calming measures such as bulb-outs and chicanes, channelizing turning movements, access management strategies, installing two-way left turn lanes (TWLTLs), offset turn lanes, and changes to intersection operations, such as installed roundabouts. Specific modifications to address the high percentage of crashes related to junctions, improper crossing, failure to yield, and intersection awareness should be implemented in the GSATS region to improve safety for all road users. These applications are most appropriate for use at intersections but may apply to corridors in urban areas with lower speeds. More information can be found in **Appendix F**.

Potential Countermeasures

- Provide Access Management
- Add/Channelize Turn Lanes
- Install Raised Medians
- Add/Improve Offset Turn Lanes
- Reconfigure Intersection Geometry
- Install/Improve Overhead Lighting
- Modify Intersection to Reduced Conflict Intersection (RCI)
- Install/Improve Pavement Markings
- Install TWLTLs

Signal Upgrades

Upgrading traffic signals is a crucial step in enhancing intersection safety and efficiency. These upgrades can be applied to aging infrastructure to improve intersection awareness and complement geometric changes to the footprint of a signalized intersection. Enhancements include modifications to traffic control devices and signal heads for both vehicular traffic and pedestrians, boosting visibility and providing appropriate crossing accommodations. Specific countermeasures to address safety for pedestrians and cyclists at intersections are discussed further in a separate section, but those related to signal hardware are included with this discussion. Key upgrades include adding high visibility backplates, near side signal heads, LED signal lighting, turn arrow signal heads, and additional signal heads. Pedestrian signal heads should be provided where crosswalks are present and can be upgraded to include LED lighting and countdown timers. Additionally, push buttons should be accessible and accompany pedestrian phasing. Consideration for mid-block crossing may include the installation of pedestrian crossing signals equipped with Hybrid Flashing Beacons (HFB), Rectangular Rapid Flashing Beacon (RRFB), or Pedestrian Hybrid Beacons (PHB). More information can be found in **Appendix F**.

Potential Countermeasures

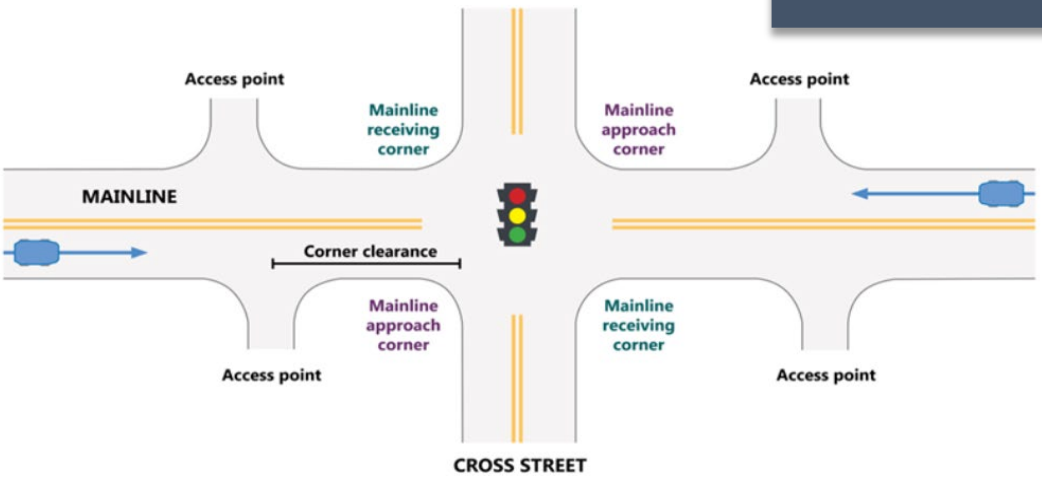
- Install Pedestrian Signal Heads
- Add Near Side Signal Heads to Intersections
- Install RRFB, PHB, or HFB at Pedestrian Crossings
- Install/Improve Overhead Lighting
- Add Signal Backplates
- Add/Install Turn Arrow Signal Heads

Access Management Strategies

Access management strategies are proactive and often retrofit improvements to an intersection or corridor to limit, channel, or redirect ingress and egress from attractions and destinations adjacent to a roadway. Fewer driveways spaced further apart allow for more orderly merging of traffic and present fewer challenges to drivers. Safe turning lanes, such as dedicated left- and right-turn lanes, indirect left-turns, U-turns, and roundabouts, help keep through-traffic flowing and reduce conflict points. Median treatments, like two-way left-turn lanes (TWLTL) and non-traversable, raised medians, are effective means to regulate access and reduce crashes. Right-of-way management involves reserving space for future road widenings, ensuring good sight distance, and appropriately locating access points. Proper spacing of intersections and interchanges helps maintain the functional integrity and operational viability of street and road systems. Adequate spacing of traffic signals can improve traffic flow and reduce delays. Adding turning and auxiliary lanes can help manage traffic flow and reduce congestion at intersections. There are heavily traveled commercial destinations in the GSATS area for both residents and tourists that would benefit from access management strategies. Public feedback indicated support for the implementation of these strategies and countermeasures to improve safety for all users in the region. More information can be found in **Appendix F**.

Potential Countermeasures

- Add/Channelize Turn Lanes
- Provide Adequate Sight Distance at Entry/Exit Points
- Install Raised Medians
- Install TWLTLs
- Driveway/Entrance Management



Schematic of an intersection and adjacent access points. Source: FHWA

Intersection Upgrades

Intersection upgrades apply to all contexts and roadway types at signalized and unsignalized locations. Upgrades can include geometric modifications, pavement treatments, signage, and signaling. Improvements can include increasing the visibility of intersections, adding dedicated turning lanes, and implementing advanced warning traffic control devices. Similar to the countermeasures included under signal upgrades and traffic control device upgrades, common intersection upgrades involve traffic signal improvements, such as protected left-turn phases, and pedestrian countdown timers. Roundabouts can reduce the severity of crashes and improve traffic flow by eliminating the need for traffic signals and reducing conflict points. Adding dedicated left-turn and right-turn lanes helps reduce congestion and improve safety by allowing turning vehicles to move out of through-traffic lanes. Enhancing crosswalks, adding pedestrian refuge islands, and creating dedicated bike lanes improve safety for non-motorized users. Improved signage and markings, such as larger signs, stop bars, and high-visibility pavement markings, help drivers navigate intersections more safely. Access management measures, like driveway consolidation and median treatments, control access points and reduce conflict points at intersections. Advanced warning systems, such as flashing beacons, and rumble strips alert drivers to upcoming intersections and reduce the likelihood of crashes. In the GSATS region, intersections may benefit from the application of one or a combination of these countermeasures to improve safety (See **Appendix F**).

Potential Countermeasures

- Modify Intersection to Roundabout
- Install/Improve Pavement Markings
- Add/Improve Pedestrian Facilities and ADA Accommodations
- Add/Install High Friction Surface Treatment (HFST)
- Add Protected Turn and/or Dedicated Pedestrian Phasing
- Install Advanced Signal Warning Signage
- Modify Intersection to Reduced Conflict Intersection (RCI)
- Install Bike Lanes
- Add/Channelize Turn Lanes
- Add TWLTL
- Add/Improve Offset Turn Lanes
- Implement Access Management
- Install/Improve Overhead Lighting
- Add Transverse Rumble Strips

Non-Motorized Enhancements

Non-motorized enhancements have been incorporated into the toolkit for each of the categories of countermeasures discussed above. Enhancements for VRUs are designed to encourage mobility and improve safety and should be incorporated into consideration for all roadway improvements. Priority should be given to examining accessibility for all users and place emphasis on surrounding development for any expected increase in users with mobility needs such as hospitals, rehabilitation facilities, elderly and assisted living, and schools. Countermeasures can include upgrading signals for midblock crossings to enhance pedestrian safety and traffic efficiency. Midblock crossings, designed to allow pedestrians to cross streets at locations other than intersections, are particularly useful in areas with long blocks or high pedestrian traffic. PHBs, HFBs and RRFBs, are special signals activated by pedestrians to advise road traffic of their presence and allow safe crossing. High-visibility crosswalks make crossings more visible to drivers, especially at night or in poor weather conditions. Pedestrian refuge islands provide raised areas in the middle of the road where pedestrians can wait safely if they cannot cross the entire street in one go. Speed tables or raised crosswalks provide a vertical separation for crossing pedestrians and slow the approach of motorists at intersections. Advanced warning signs alert drivers to upcoming pedestrian crossings, giving them more time to slow down and stop. Additionally, enhancing the lighting around midblock crossings with LED lights improves visibility for both pedestrians and drivers. VRU's are the most vulnerable users of the transportation system and should be considered when any roadway improvements are made in the GSATS area. All facilities should comply with ADA access requirements and standards. More information can be found in **Appendix F**.

Potential Countermeasures

- Add/Improve Crosswalk or Raised Crosswalk
- Install Pedestrian Refuge Islands
- Add/Improve Sidewalk
- Install RRFB
- Install Protected Pedestrian Mid-Block Crossings with HFB or PHB
- Install/Improve ADA Compliant Pedestrian Facilities
- Install Pedestrian Signal Heads
- Add Bicycle Lanes
- Add/Improve Overhead Lighting

Project Location Selection

The initial selection of project intersections and corridors advanced for safety recommendations was locations with the highest concentration of crash frequencies and severities. These lists were reviewed with the Project Team and Steering Committee to gain consensus on the findings, localized feedback, and determine the impact of ongoing, planned, and/or committed projects at or adjacent to those locations. Some locations were removed from consideration as safety and other improvements were planned for implementation. The top 10 intersections and 11 corridors advanced through this iterative process are discussed below. Project details can be found on the interactive dashboard on the agency website.

Intersection Analysis

Intersections were selected utilizing the Equivalent Property Damage Only (ePDO) crash formula below:

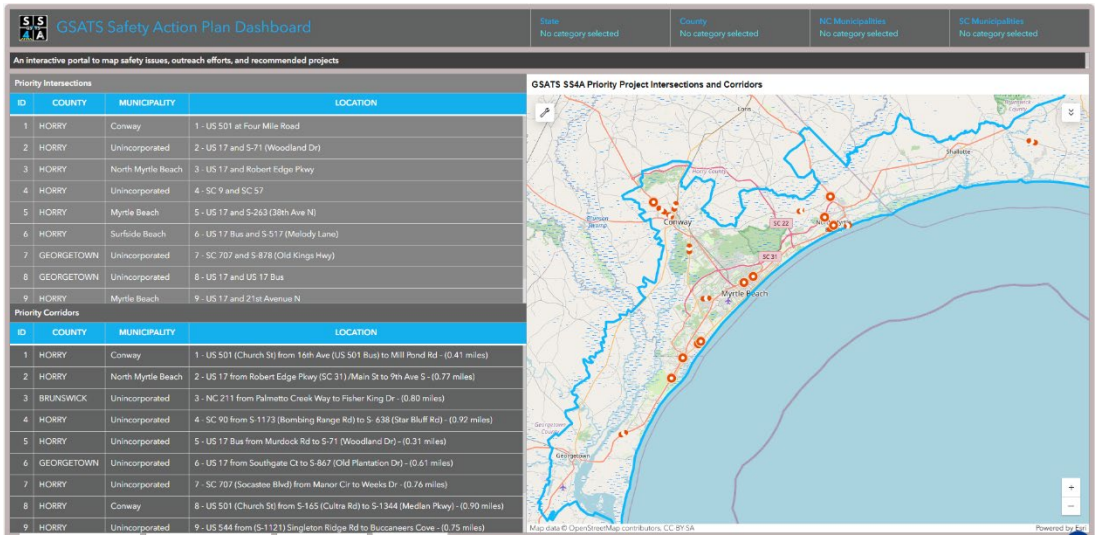
$$EPDO\ Crashes = (N_K * EPDO_K) + (N_A * EPDO_A) + (N_B * EPDO_B) + (N_C * EPDO_C) + N_O$$

EPDO=weighting factors for severity according to SCDOT estimated crash costs **N**=number of crashes

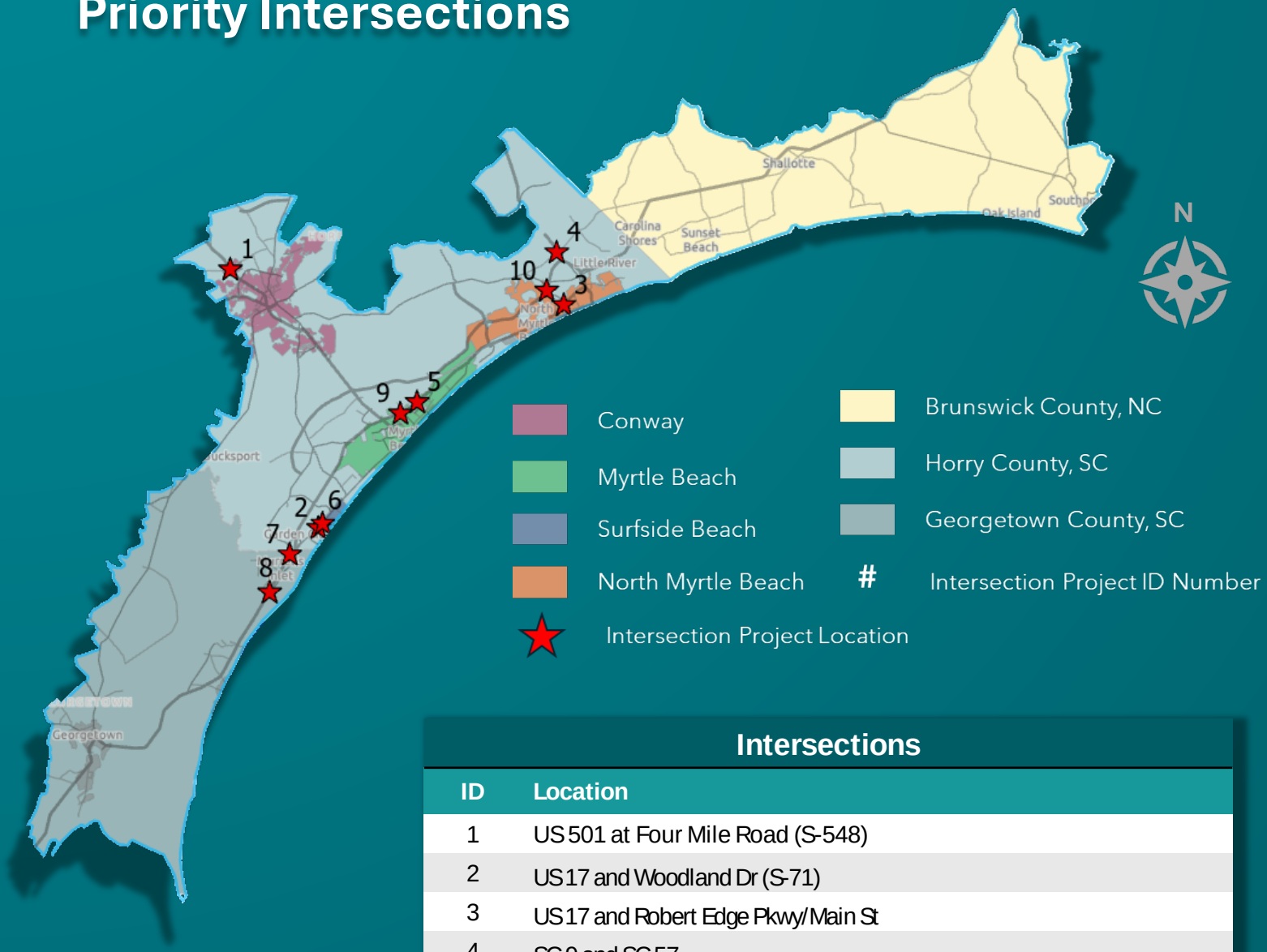
This method assigns a weight to each crash based on its severity, with fatal and injury crashes given higher weights compared to property damage-only crashes. By collecting crash data, including the type and severity of each crash, the ePDO value for each location can be calculated. This value is a sum of the weighted crashes, providing a single metric that reflects both the frequency and severity of crashes. The sites are ranked from high to low to establish an initial intersection candidate list. The top 10 selected intersections are shown on the following page.

Corridor Analysis

Corridors were selected by identifying sections with the highest frequency of FSI crashes within an established segment length. Segments were then ranked from high to low to develop the candidate list. Corridor lengths were further adjusted to include additional FSI crashes in adjoining segments and to establish logical termini based on the roadway network. Other corridors were added based on visual inspection of FSI clusters through the dashboard and stakeholder feedback of known corridor safety issues. The top 11 selected corridors are shown in the graphic following the intersection list on the following page.



Priority Intersections

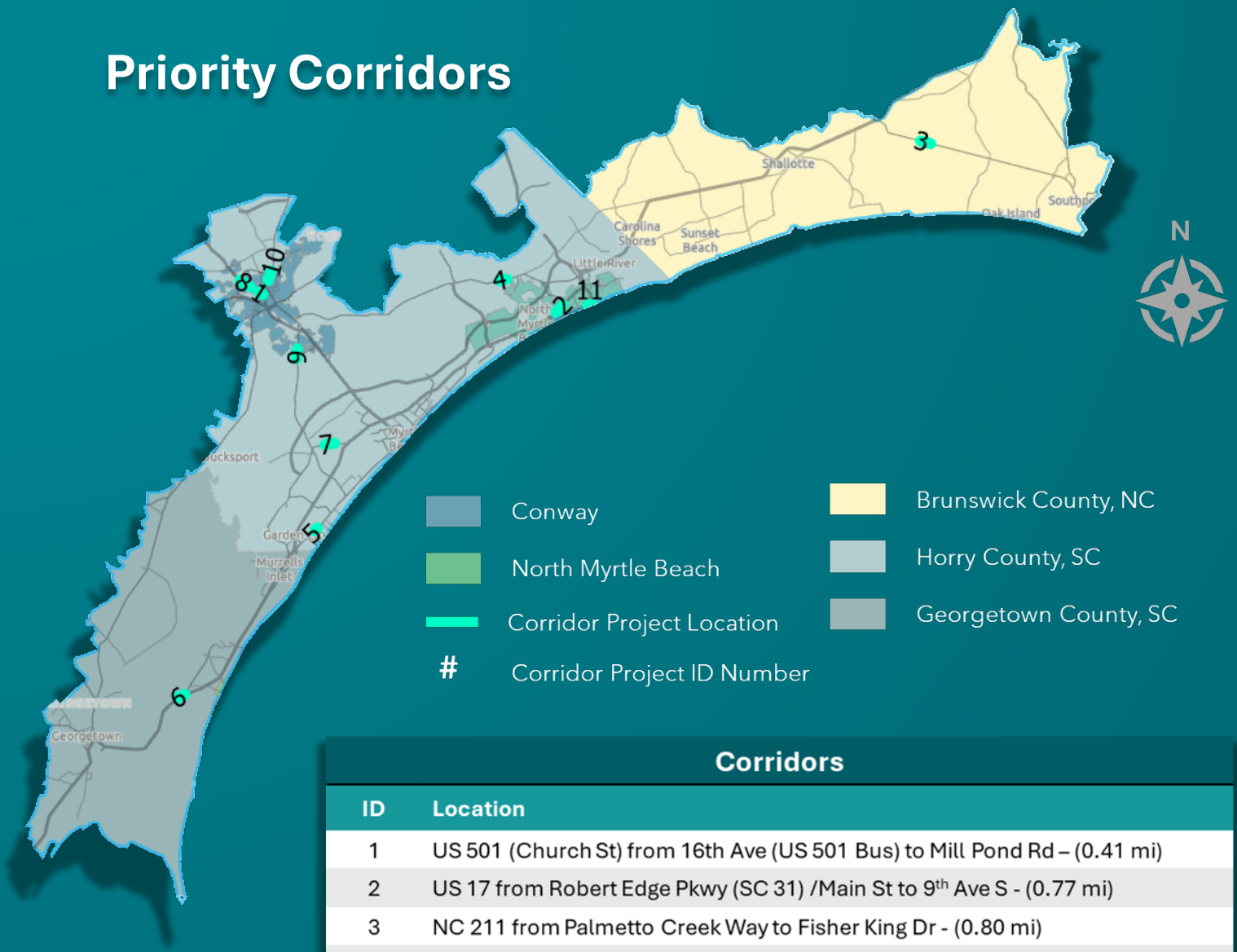


Intersections

ID	Location
1	US 501 at Four Mile Road (S-548)
2	US 17 and Woodland Dr (S-71)
3	US 17 and Robert Edge Pkwy/Main St
4	SC 9 and SC 57
5	US 17 and 38th Ave N (S-263)
6	US 17 Bus and Melody Lane (S-517)
7	SC 707 and Old Kings Hwy (S-878)
8	US 17 and US 17 Bus
9	US 17 and 21st Avenue S
10	SC 31 and Robert Edge Pkwy Interchange

Project Locations were determined by an iterative screening process. The evaluation was initiated by a determination of the high risk areas and context (FSI, HIN, functional class, speeds, and volumes), equity overlays, VRU crashes, ePDO, and public input. A list of potential project locations was developed for review in conjunction with the Project Team, Steering Committee, and partner agencies. Feedback was used to determine which intersections had current or planned improvements with safety enhancements and remove those from further consideration in this Safety Action Plan. Projects removed from the list were replaced with the next project on the list until consensus on the top 10 was achieved. The final project list was presented to the public during a second round of public meetings.

Priority Corridors



Corridors

ID	Location
1	US 501 (Church St) from 16th Ave (US 501 Bus) to Mill Pond Rd – (0.41 mi)
2	US 17 from Robert Edge Pkwy (SC 31) /Main St to 9th Ave S - (0.77 mi)
3	NC 211 from Palmetto Creek Way to Fisher King Dr - (0.80 mi)
4	SC 90 from S-1173 (Bombing Range Rd) to S- 638 (Star Bluff Rd) – (0.92 mi)
5	US 17 Bus from Murdock Rd to S-71 (Woodland Dr) – (0.31 mi)
6	US 17 from Southgate Ct to S-867 (Old Plantation Dr) – (0.61 mi)
7	SC 707 (Socastee Blvd) from Manor Cir to Weeks Dr - (0.76 mi)
8	US 501 (Church St) from S-165 (Cultra Rd) to S-1344 (Medlan Pkwy) - (0.90 mi)
9	SC 544 from (S-1121) Singleton Ridge Rd to Buccaneers Cove - (0.75 mi)
10	US 701 from Boundary Street to Columbia Dr (0.78 mi)
11	SC 65 N. Ocean Blvd from Shorehaven Dr to SC 9 (0.36 miles)

Project Corridors were identified by an iterative screening process. The evaluation was initiated by a determination of the high risk areas and context (FSI, HIN, functional class, speeds, and volumes), equity overlays, VRU crashes, ePDO, and public input. A list of potential project locations was developed for review in conjunction with the Project Team, Steering Committee, and partner agencies. Feedback was used to determine which intersections had current or planned improvements with safety enhancements and remove those from further consideration in this Safety Action Plan. Projects removed from the list were replaced with the next project on the list until consensus on the top 10 was achieved. One additional corridor was added to the list that met the project criteria and was identified as a priority by a member of the Steering Committee. The final project list was presented to the public during a second round of public meetings.

Projects for Implementation

After selecting the project intersections and corridors, the countermeasures outlined in the toolkit were selected for each site for implementation. The engineering designs for these improvements were then reviewed by the project team, steering committee, and the public to gather feedback and comments. The responses from the public and steering committee were valuable additions to the project development plans incorporated as part of this Study. Detailed information, including project **cut sheets**, **concepts**, and **renderings** have been grouped together for each intersection and corridor and provided in **Appendix H**. Descriptions and examples of each are provided below.

Project Cut Sheets

Project cut sheets were developed to establish the safety needs at a location from the crash data and then develop a list of solutions for implementation. Cut sheets provide a summary of crash information, intersection characteristics, and list of proposed countermeasures. The list of countermeasures includes a description of the application, a CRF, estimated cost per countermeasure, total estimated cost, and Benefit/Cost Ratio (B/C). The B/C is calculated by dividing the countermeasure benefits by the estimated cost of implementation. Benefits were calculated based on the reduction of the societal cost of crashes expected to be addressed by the countermeasure. Therefore, a positive B/C represents a benefit that exceeds the anticipated cost of a project. A sample of an intersection project cut sheet from **Appendix H** is below:

Project Sheet

Type: Intersection | Project ID: I-1

Location: US 501 & S-548/Four Mile Road (33.873539°, -79.104818°)

[1]CRF = Crash Reduction Factor
[2]Cost = Estimated
[3]B/C = Benefit/Cost Ratio

INTERSECTION CHARACTERISTICS

Major Street | Minor Street	US 501 | S-548/Four Mile Road
Functional Classification (Major | Minor)	Principal Arterial | Major Collector
Cross-Section (Major | Minor)	4-Lane Divided | 2-Lane Undivided
Posted Speed Limit (Major | Minor)	55 mph | 35-45 mph
Estimated 2023 AADT (Major | Minor)	21,800 vpd | 3,000 vpd
Jurisdiction	Horry County | City of Conway
Schools Within ½ Mile?	Yes
Within Justice40 (J40) Area?	Yes

PROPOSED COUNTERMEASURES

Countermeasure	CRF[1]	Cost[2]	B/C[3]
Install southbound right-turn lane along US 501.	14.0%	$150,000	1.16
Install pedestrian accommodations (high-visibility ladder-style crosswalk and pedestrian signal heads).	48.0%	$12,500	>100
Extend existing sidewalk along west side of US 501 to the south along frontage of nearby motel	40.2%	$27,000	>100
Install exclusive left-turn lanes along the S-548 and Four Mile Road approaches.	47.0%	$600,000	3.43
Install high friction surface treatment (HFST) along US 501 southbound approach.	48.5%	$105,000	4.78
Evaluate yellow and red clearance intervals and modify as necessary.	8.0%	$1,500	>100
Consider and install protected only left-turn phasing for both approaches along US 501.	28.2%	$4,000	>100
Manage access at the southeast quadrant of the intersection to formalize access to the existing gas-station parcel.	18.0%	$70,000	<1.0
		TOTAL ESTIMATED COST	$951,130

CRASH HISTORY LEGEND

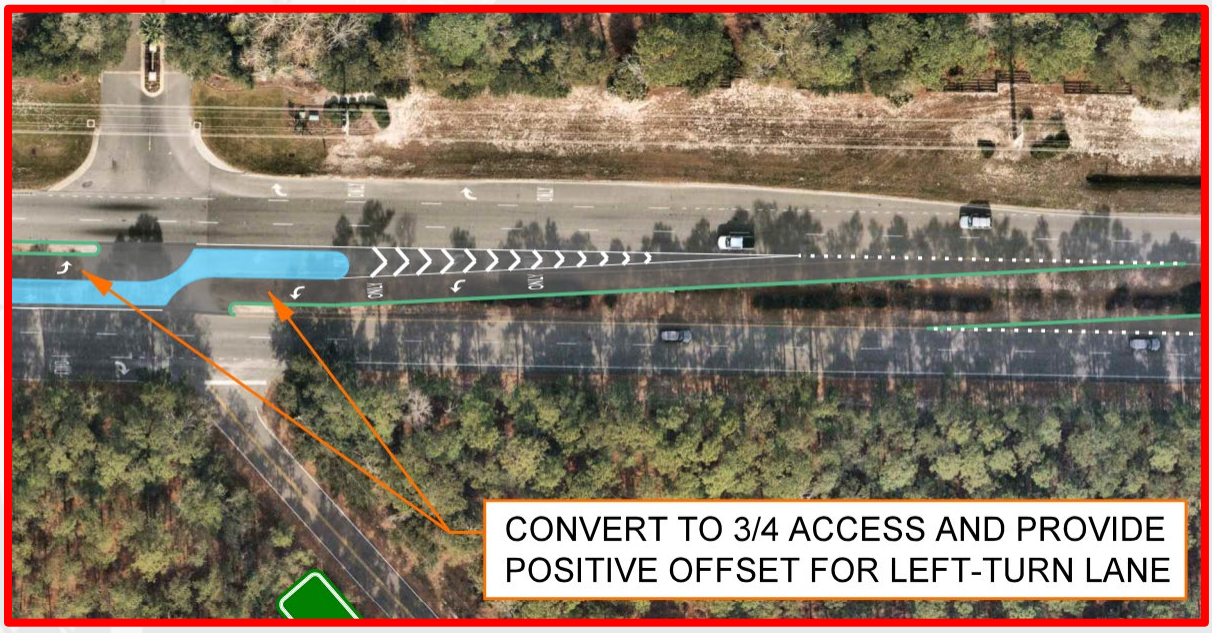
MANNER OF COLLISION	SEVERITY	PEDESTRIAN/BIKE
Angle ▲	Fatal (K)	Pedestrian
Rear End ●	Incapacitating Injury (A)	
No Collision w/ Motor Vehicle ♦	Non-Incapacitating Injury (B)	Bike
Sideswipe ■	Possible Injury (C)	
Head On ★	Property Damage Only (O)	
Other/Unknown ●		

NUMBER OF CRASHES (2019 – 2023)

Type	Fatal (K)	Incapacitating Injury (A)	Non-Incapacitating Injury (B)	Possible Injury (C)	Property Damage Only (O)	Total
Vehicle	1	2	6	9	67	85
Ped/Bike	1	0	0	0	0	1
Day	1	1	4	8	47	61
Night	1	1	2	1	20	25

Project Concepts

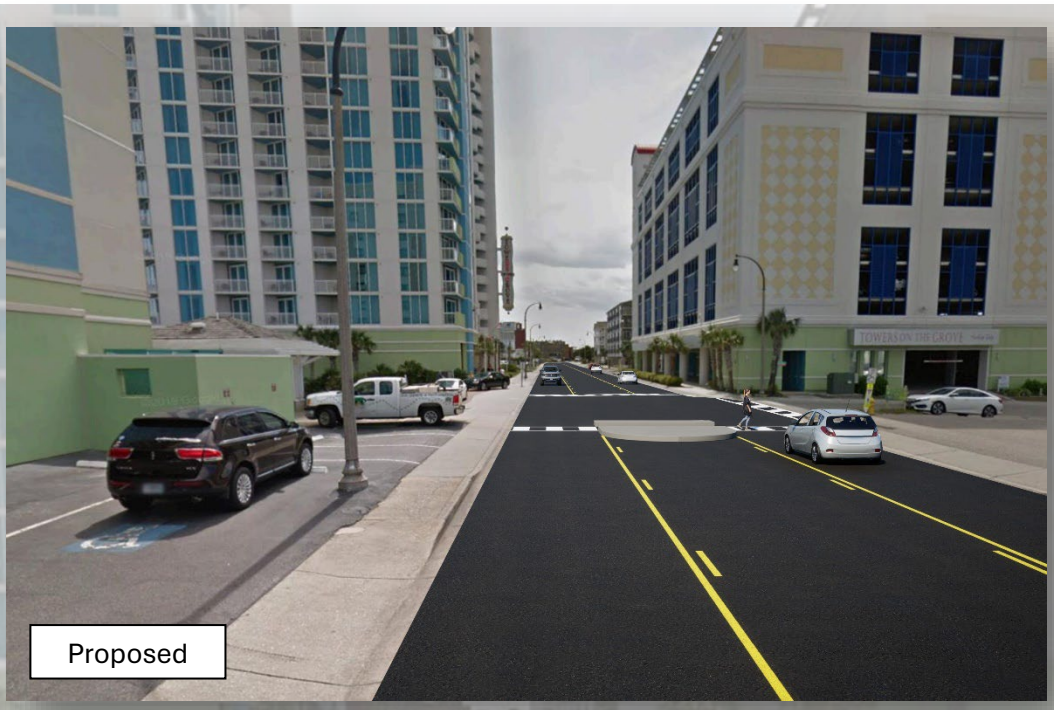
Project concepts were developed for the intersections and corridors selected for inclusion in this Safety Action Plan to detail the countermeasures described in the cut sheets. These details include the conceptual plans with enhanced imagery and drawings to convey the total range of countermeasures applied and location of application. The concept drawings have been provided in high resolution with details that can be seen via the digital document by using the viewing software to zoom in on an area. An example of a corridor project concept drawing from **Appendix H** has been provided below with a sample clipped from an area that was enlarged for viewing.

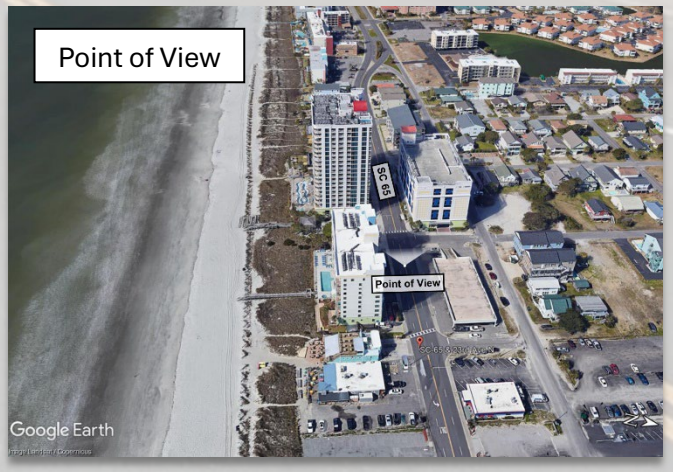


Zoom In

Project Renderings

Renderings of the projects were developed to provide before and after representations of the projects to convey the potential visual outcomes post implementation. Intersection renderings show the project concepts over the existing conditions. Renderings of the project corridors show a before and after example of a specific point representative of the corridor. The following is an example of the existing conditions and rendering for a project corridor from **Appendix H**:



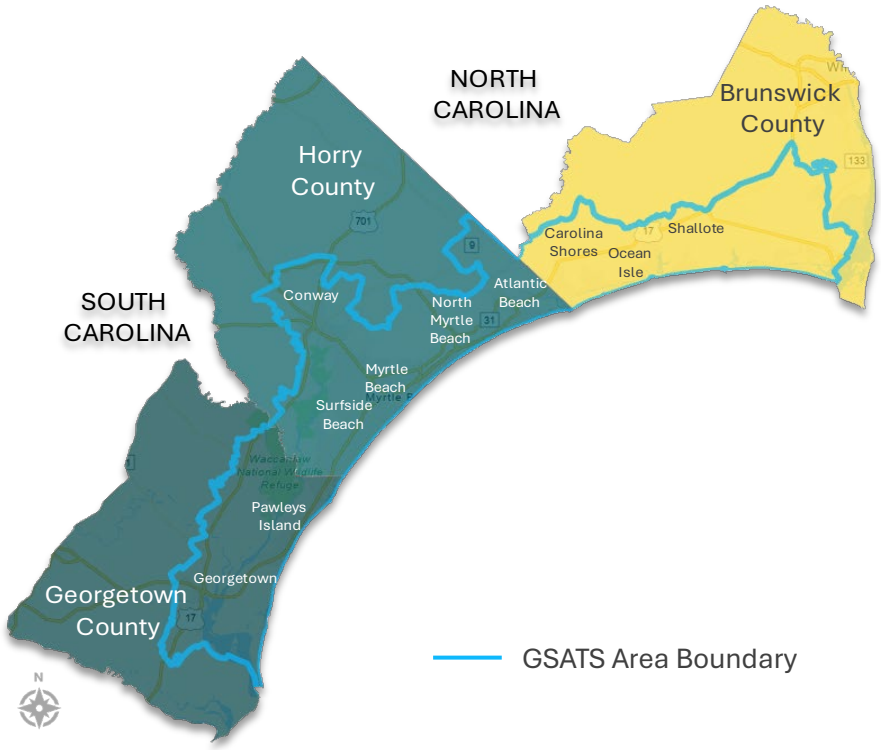


Existing

Project Prioritization

The GSATS area includes portions of Horry County and Georgetown County in South Carolina and a portion of Brunswick County in North Carolina. The municipalities served by the MPO include Myrtle Beach, Conway, North Myrtle Beach, Georgetown, Surfside Beach, Shallotte, Sunset Beach, Carolina Shores, Calabash, Holden Beach, Ocean Isle Beach, Varnamtown, Briarcliffe Acres, Atlantic Beach, and Pawleys Island.

GSATS has been proactive in Safety Action Planning by working with their partner agencies, municipalities, NCDOT, and SCDOT to commit to an eventual goal of zero roadway fatalities and serious injuries by the target dates established in the Transportation Performance Measures for SCDOT and NCDOT. This Plan used an analysis of existing conditions, FSI crash trends, HIN, equity overlays, and GIS mapping to establish the high-risk crash locations and corridors. With input from the public and Steering Committee, the Plan established a set of specific safety countermeasures to apply in the high-risk crash locations and corridors.



Implementation of these projects will be initiated at the local level and include prioritization of those projects by the jurisdictions responsible for the local match. Municipalities will coordinate with GSATS when seeking to program projects for implementation. There are a variety of factors identified in the creation of this Plan that will aid in a process to assess the comprehensive set of projects and strategies against a uniform set of parameters to prioritize projects for completion. The project dashboard can be used to complete the information in the prioritization matrix for the projects identified in this Plan and for the identification of future or additional projects considered by the jurisdictions in the GSATS region. Collaboration with the project Steering Committee is essential in the decision-making process to select the projects for implementation funding. However, a completed matrix that prioritizes the intersections and corridors evaluated for this SAP is included in **Appendix I**.

Project Prioritization Criteria, Rating, and Weight

	Description	Rating	Weight
Safety Need 1	The project is in an area that has been identified as part of the HIN.	No=0 Yes=10	10%
Safety Need 2	Fatal or serious injury crashes occurred in the project area during the crash data analysis period from 2019-2023 (within 250').	Number of FSI Crashes: 1-2 = 5 3-4 = 10 5-6 = 15 7+ = 20	20%
Safety Need 3	The corridor speed limit in the project area is greater than 35 miles per hour.	Under 35=0 35 to 55=5 55+=10	10%
Safety Need 4	The project area was identified by the public as a location with safety concerns.	No=0 Yes=10	10%
Equity Need 1	The project is in an area with greater than 20 percent minority (ie nonwhite) population.	No=0 Yes=10	10%
Equity Need 2	The project is in an area identified as disadvantaged by the Justice 40 Initiative.	No=0 Yes=10	10%
Equity Need 3	Is the project in an Area of Persistent Poverty (20% or more).	No=0 Yes=10	10%
Vulnerable Road Users	Fatal or serious injury crashes involving a bicyclist or pedestrian occurred within 100 feet of the project area during the crash data analysis period from 2019-2023.	Number of FSI Crashes: 0=0 1-2=5 3+=10	10%
Project Cost	The estimated cost for the project.	$0-$200k=10 $201k-$400k=8 $401k-$600k=6 $601k-$800k=4 $801k-$1M=2 $1M+=0	10%

Use the project dashboard on the GSATS website for rating information:

GSATS Safety Action Plan Dashboard

Click Link

Safety Action Plan Evaluation

Successful Safety Action Plans establish a process to evaluate and assess that implemented safety measures are effective and improving safety. Evaluation involves collecting and analyzing data from various sources such as crash reports, traffic flow studies, and feedback from partner agencies, stakeholders, and the public. By examining this data, GSATS can assess the impact of safety countermeasures, identify trends, and pinpoint areas where further improvements are needed. The evaluation helps understand the real-world effectiveness of safety measures and highlight unforeseen issues that may have developed.

GSATS and the Steering Committee will be responsible for reviewing the findings and discuss the outcomes of the safety measures. By engaging all relevant parties, the evaluation phase will enhance the SAP and bolster the shared commitment to safer transportation systems in the GSATS region.

The insights gained from evaluation and project tracking are used to refine and enhance the SAP. Based on the analysis, recommendations are made for adjustments or additional measures to further mitigate risks. This iterative process ensures that the safety plan remains dynamic and responsive to changing conditions, such as new traffic patterns or emerging technologies. Additionally, the evaluation phase provides an opportunity to celebrate successes and recognize the efforts of those who contribute to maintaining a safe transportation environment. Keeping the public informed is crucial to the success of this effort. The project dashboard will remain an active resource for the public to explore the projects identified in the SAP and track the status of improvements.

A template to monitor the progress of the Safety Action Plan has been provided below and will follow the implementation of projects on a cyclical basis for tracking, evaluation, and assessment.

Reduction of FSI Crashes	Use crash data to quantify the reduction in FSI crashes over time.
Reduction of FSI VRU Crashes	Use crash data to quantify the reduction in FSI crashes involving VRU's over time.
Equity and Accessibility	Quantify the number of projects implemented in areas identified as low income, minority, and disadvantaged that benefit from the project by population or area.
Encouragement and Education	Quantify the number of community members reached by educational campaigns and outreach messaging.
Community Perception and Support	Use the GSATS website to conduct online surveys targeting feedback on safety in areas where projects have been implemented.
Social and Economic Impact	Utilize FHWA's Crash Costs for Highway Safety Analysis to quantify the cost related benefits based on the reduction in FSI crashes.
Sustainability and Long-Term Impact	Conduct a site view to review the sustainability of the project to assess and document conditions and/or need for maintenance.
Behavioral Changes	Conduct field surveys to observe changes in driver behavior and document observations.

Alternative Funding Resources and Disadvantaged Community Designations

GSATS was awarded a SS4A Planning Grant to develop this Safety Action Plan in 2023. The SAP is a requirement to be eligible for SS4A Implementation Grant funds. Implementation Grants provide Federal funds to implement projects and strategies identified in an Action Plan to address a roadway safety problem. Eligible projects and strategies can be infrastructural, behavioral, and/or operational activities. Implementation Grants may also include supplemental planning and demonstration activities to inform an existing Action Plan, and project-level planning, design, and development activities. While SS4A Implementation Grants are designed to implement the recommendations in the SS4A SAP, the Implementation Grant program is very competitive compared to the Planning Grant program. In 2024, almost all requests for Planning Grant funds were awarded. However, about 20% of applications were awarded Implementation funds. It is highly recommended that GSATS and/or its member jurisdictions apply for Implementation Grant funds. However, it is advantageous to explore other funding opportunities outside of the Implementation Grant program that would qualify for funding SS4A projects.

Appendix J includes funding strategy guidance to implement the recommendations in the GSATS SAP. It also includes a list of alternative federal funding sources and state funding sources for the recommended projects in the SAP. There are several tools that are recognized by USDOT and other federal agencies that designate Census tracts and counties as disadvantaged based on a variety of metrics. **Appendix K** includes information about disadvantaged community designations and an equity analysis for the projects identified in the SAP.