



Local Road Safety Plans

In Georgia and Beyond

Rawad Hani, PE, TE

Ariel Godwin, AICP



What is a Local Road Safety Plan?

- A planning process and document identifying and prioritizing roadway safety improvements on local roads.
- The FHWA provides a planning framework and resources.
- Coordinated with the State Highway Safety Plan.

Why create a LRSP?

- In Georgia, 83% of roads are maintained by local agencies.
- While local roads are less traveled than State highways, they have a much higher rate of fatal and serious injury crashes.
- In Georgia, approximately 42% of non-Interstate fatalities occur on locally owned roads.
- Developing an LRSP is an effective strategy to improve local road safety for all road users and support the goals of a State's overall Strategic Highway Safety Plan (SHSP).



Safety Benefits:

Agencies have experienced the following benefits after LRSP implementation:

25%

reduction in county road fatalities in Minnesota.

17%

reduction in fatal and serious injury crashes on county-owned roads in Washington State.

35%

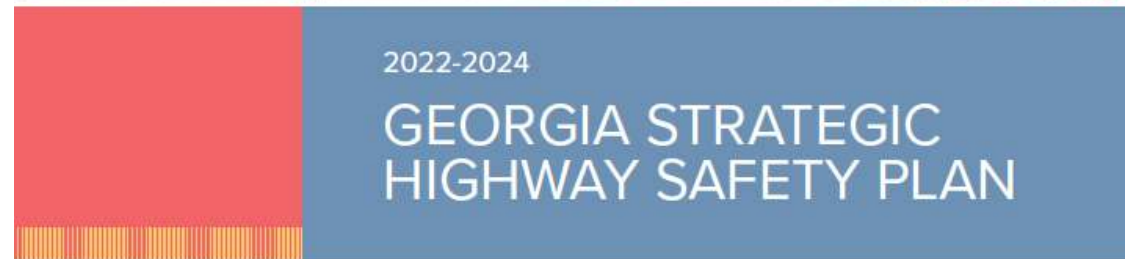
reduction in severe curve crashes in Thurston County, WA.

Why create a LRSP?

- Reduce fatalities and injuries
- Develop lasting partnerships (4 E's)
- Promote greater awareness of road safety and risks
- Leverage funding opportunities
- Transparency in prioritization and funding of projects
- Systemic, data-driven approach to improving safety
- Opportunity to incorporate safety improvements into routine projects such as resurfacing

Georgia Strategic Highway Safety Plan

- Problem: Georgia's SHSP goals are for traffic fatalities to keep increasing
- "Target" is for a **69% increase** in non-motorist serious injuries and fatalities 2019-2024
- Goal: **90% increase** in serious injuries
- Another goal: **18% increase** in fatalities
- Population is growing. But the SHSP also calls for a slight increase in fatalities per VMT (1.19 to 1.22)



Safety Performance Measures & Goals

CORE OUTCOME	PERFORMANCE MEASURE	GOALS					
TRAFFIC FATALITIES	To maintain traffic fatalities under the projected 1,770 (2020-2024 rolling average) by 2024.	BASELINE	ESTIMATE		TARGET		
		2019 1,505	2020 1,559	2021 1,617	2022 1,671	2023 1,722	2024 1,770
FATALITIES/ 100M VMT	To maintain traffic fatalities per 100M VMT under the projected 1.22 (2020-2024 rolling average) by 2024.	BASELINE	ESTIMATE		TARGET		
		2019 1.19	2020 1.20	2021 1.21	2022 1.21	2023 1.22	2024 1.22
SERIOUS INJURIES IN TRAFFIC CRASHES	To maintain serious injuries in traffic crashes under the projected 11,069 (2020-2024 rolling average) by 2024.	BASELINE	ESTIMATE		TARGET		
		2019 5,836	2020 6,518	2021 7,393	2022 8,443	2023 9,669	2024 11,069
SERIOUS INJURIES IN TRAFFIC CRASHES/ 100M VMT	To maintain serious injuries in traffic crashes per 100M VMT under the projected 7.68 (2020-2024 rolling average) by 2024.	BASELINE	ESTIMATE		TARGET		
		2019 4.61	2020 4.97	2021 5.46	2022 6.08	2023 6.82	2024 7.68
NON-MOTORIST SERIOUS INJURIES AND FATALITIES	To maintain non-motorist serious injuries and fatalities under the projected 1,025 (2020-2024 rolling average) by 2024.	BASELINE	ESTIMATE		TARGET		
		2019 608	2020 663	2021 734	2022 818	2023 915	2024 1,025

SHSP Emphasis Areas

- Despite the SHSP goals/targets, alignment with SHSP may benefit local governments when seeking funding



Pedestrian Safety



Motorcycle Safety



Older Drivers
(55+ years)



Impaired Driving



Occupant Protection



Distracted Driving



Young Adult Drivers



Bicycle Safety



**Intersection Safety &
Roadway Departure**

Countermeasures & Strategies

COUNTERMEASURE

STRATEGY

Communications and Outreach on Distracted Driving

Support media campaigns and educational outreach events that include messaging to raise awareness on Georgia's Hands-Free Law. Provide educational materials to specific groups (courts and judges).

High-Visibility Cell Phone/Text Messaging Enforcement

Train and work collaboratively with law enforcement on various contributing factors of motor vehicle (MV) crashes including distractions

GDL requirements for Beginning Drivers

Collaborate with the Georgia Department of DDS to enhance driving exams to be more comprehensive

Provide engineering solutions to address distracted driving

Identify infrastructure improvements such as the Off-System Safety Program; work with FHWA to develop Local Road Safety Plans by local governments and install roadway rumble strips to alert drivers.

Understand the extent of distracted driving in Georgia

Conduct an annual statewide Distracted Driving observational study.

States that set targets to
improve safety

States that set targets to
increase deaths and serious injuries

States that **achieved**
their safety targets

Delaware **Michigan**
Iowa **Minnesota**
Kansas **Vermont**
Maine **Wyoming**

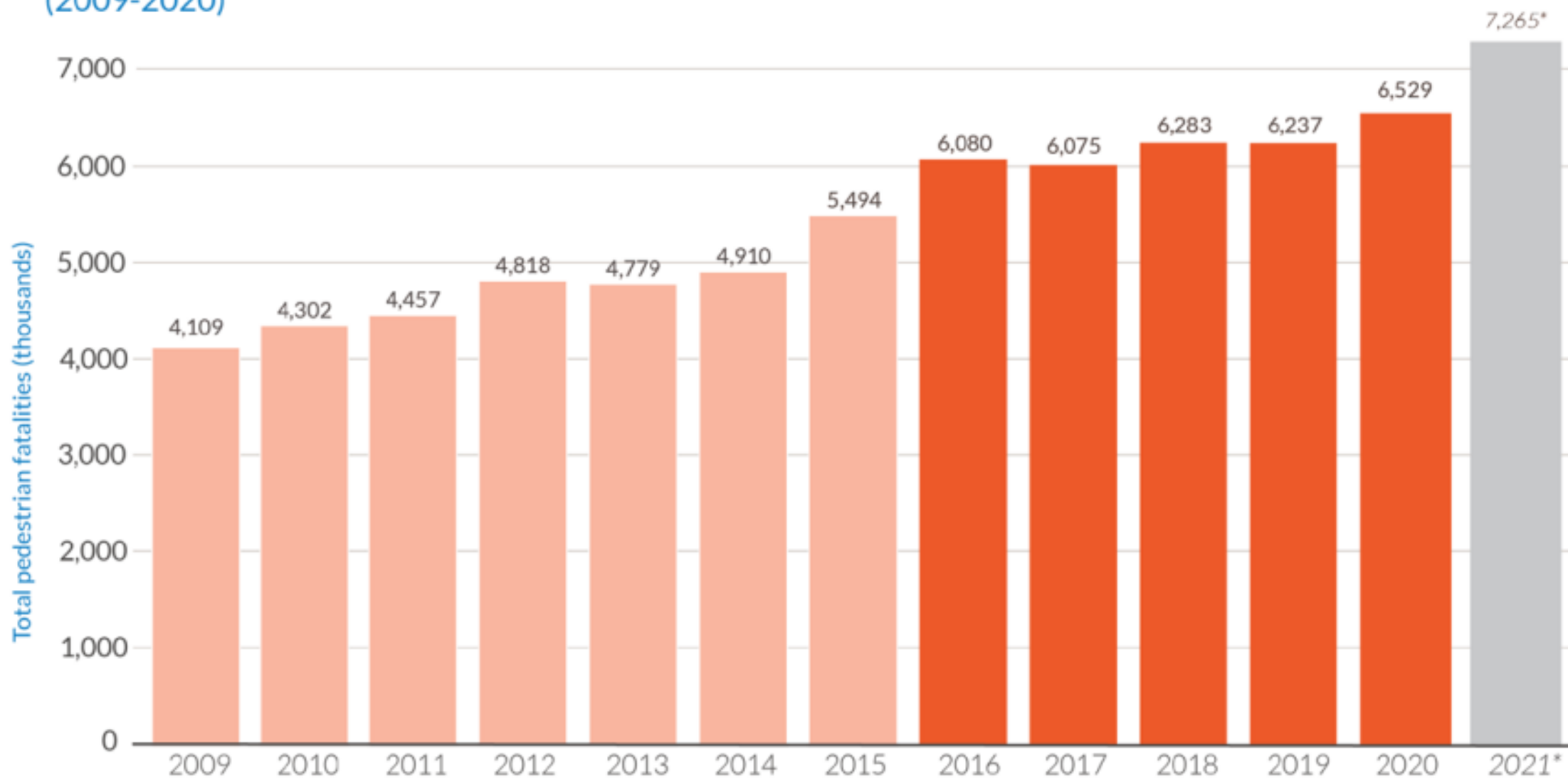
Alabama **North Dakota**
Massachusetts **Oklahoma**
New Mexico **Rhode Island**
New York **Utah**

States that **exceeded**
their safety targets

Alaska **Maryland** **Oregon**
Arizona **Mississippi** **Pennsylvania**
DC **Missouri** **South Carolina**
Hawai'i **Montana** **Tennessee**
Idaho **New Hampshire** **Texas**
Illinois **New Jersey** **Virginia**
Kentucky **North Carolina** **Washington**
Louisiana **Ohio** **West Virginia**

Arkansas **Georgia**
California **Indiana**
Colorado **Nebraska**
Connecticut **Nevada**
Florida **South Dakota**

U.S. pedestrian fatalities (2009-2020)

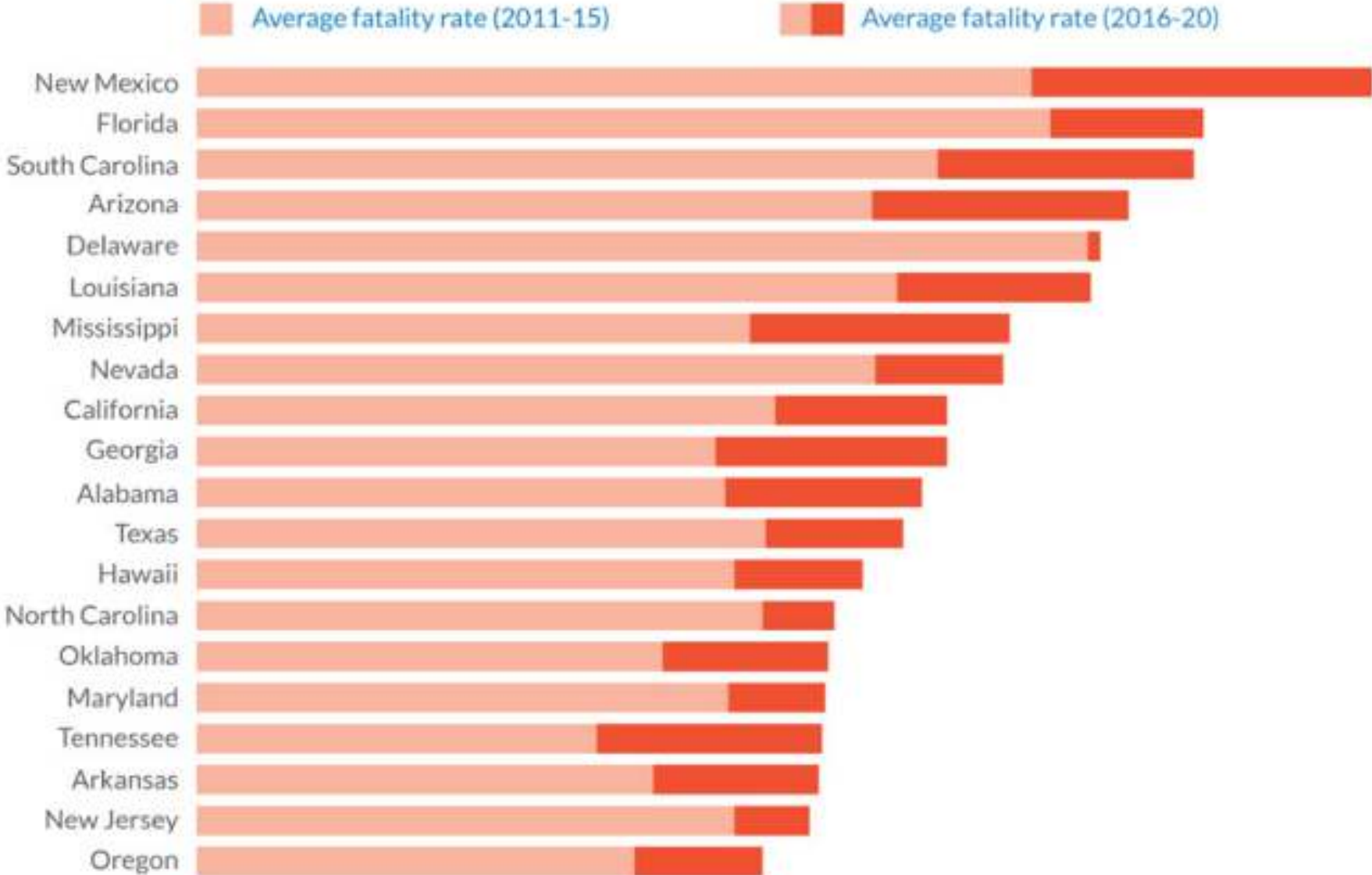


**This estimate for 2021 is produced by applying the 11.5 percent increase for 2021 projected by the Governors Highway Safety Administration (GHSA) to the federal FARS data for 2020 used in this report.*

U.S. pedestrian fatalities

No states in the top 20 are improving

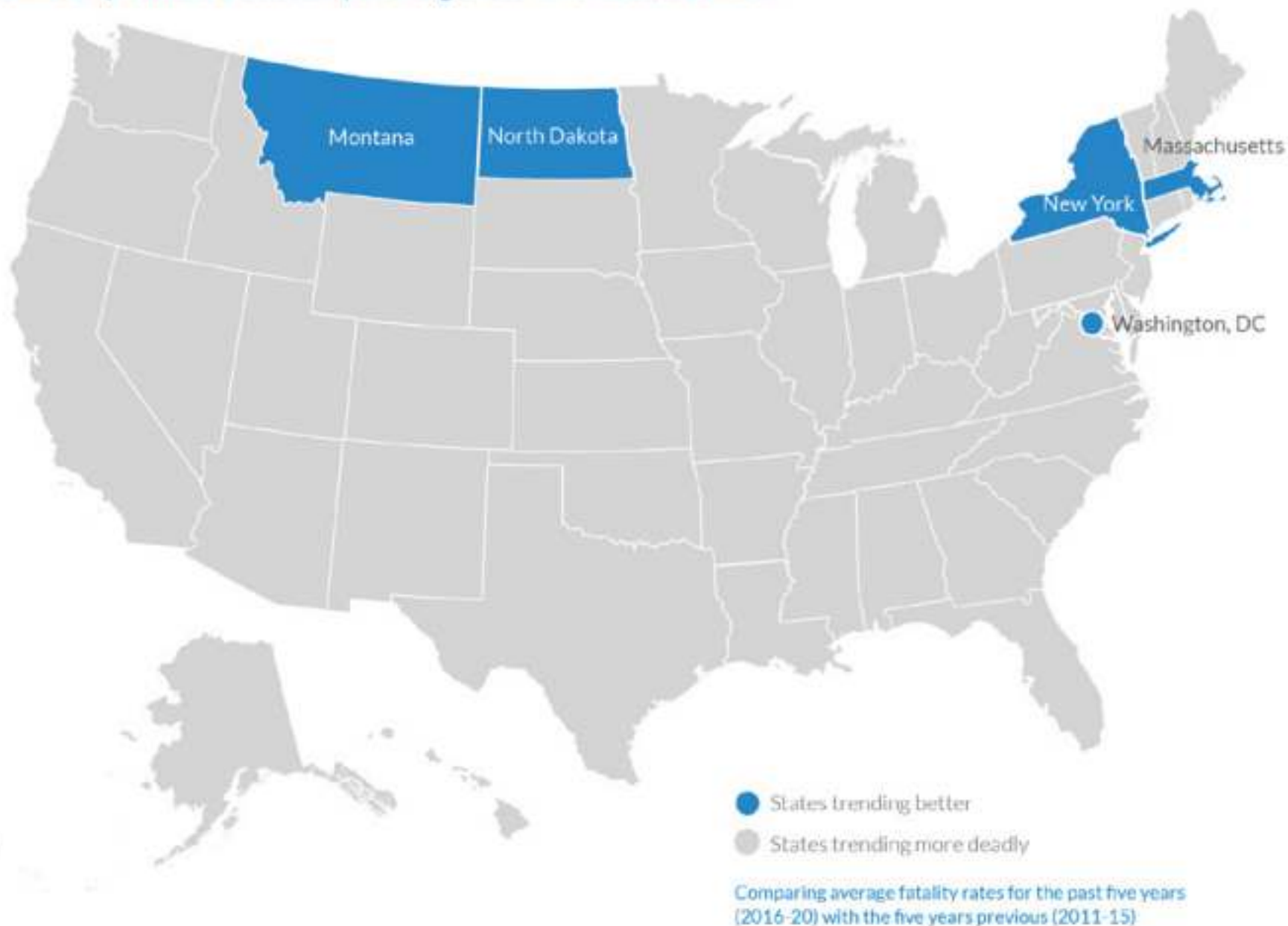
All have gotten significantly more deadly



U.S. pedestrian fatalities

Long term trends in fatalities

Have any states been improving over the last decade?



LRSP Process

- Identify stakeholders
- Use safety data
- Choose proven solutions
- Implement solutions



Identify stakeholders

- Opportunity for collaboration between different disciplines
 - Planning
 - Engineering
 - Law enforcement
 - Public health
 - Advocacy organizations
 - Elected officials
 - Community input

City of Milton example

Potential Community Partners/Stakeholders

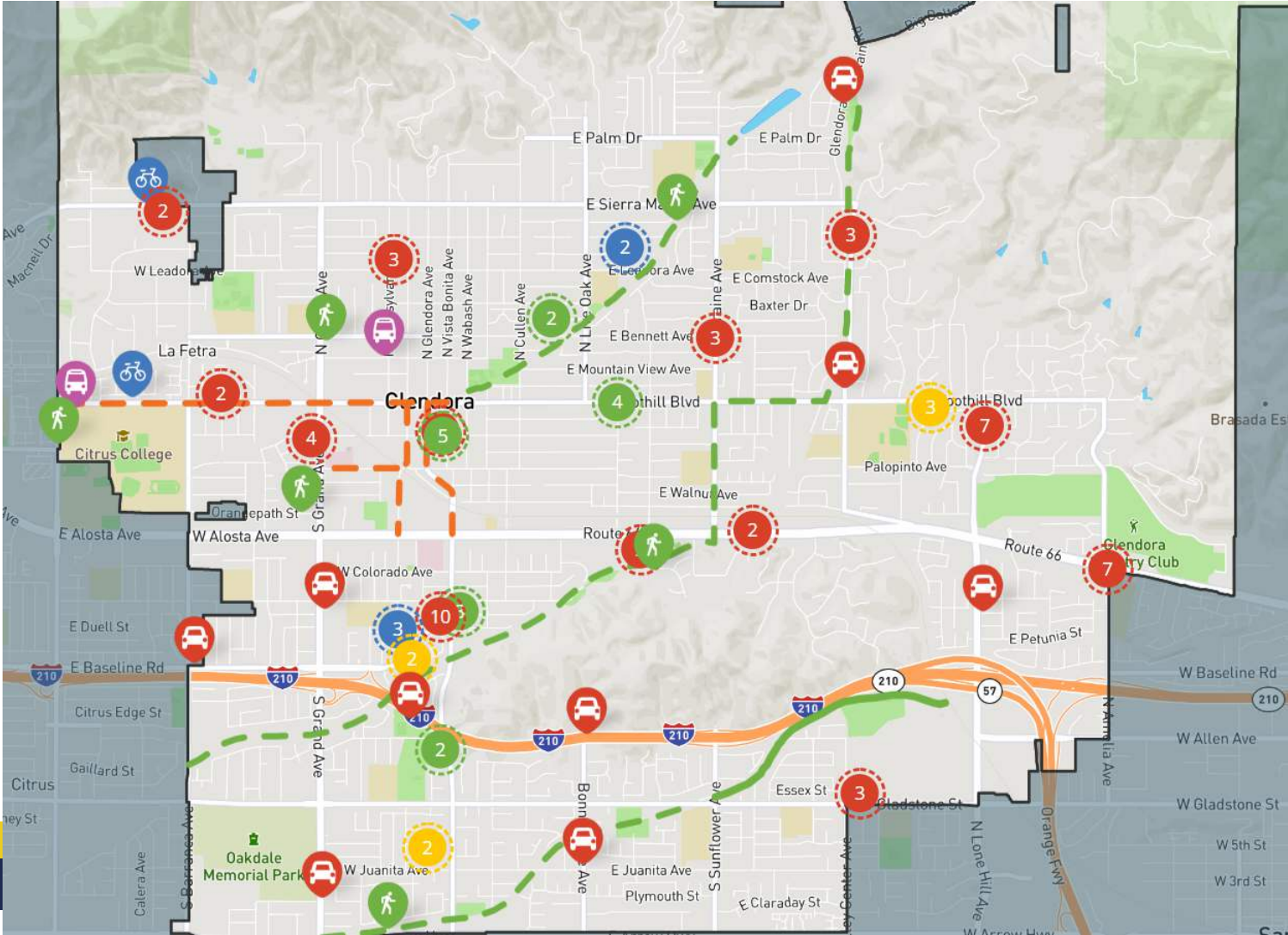
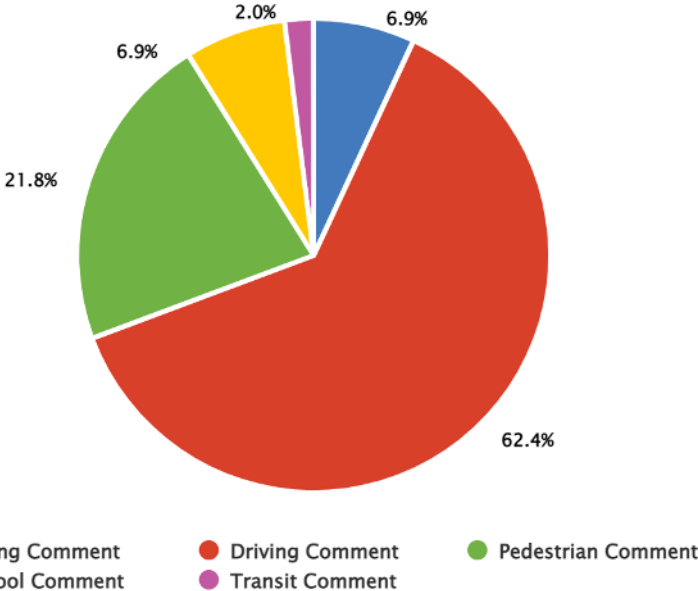
- Fulton County Schools (Milton High School, Cambridge High School)
- City of Milton Police Department
- City of Milton Fire Department
- Citizens Government Academy
- Georgia Bikes
- The Southern Bicycling Club
- Olde Blind Dog Cycling Club
- Milton Equestrian Committee
- Alive at 25 Driver Safety Program
- Focus on Milton Facebook Group/other community Facebook groups
- HOAs
- Milton Farmers Market
- Newspapers/Publications/Media (Milton Herald, Our Milton Neighbor, North Georgia Living)
- Police Chief's Advisory Board

Community Input

- Locations of concern
- Perspectives of different road users, different modes
- Perspectives from different disciplines
- Representation of different groups
- Input from people of different ages
- Perspectives on what safety problems are most pressing

Community Engagement

- Online surveys
- Interactive maps



IDENTIFY PRIMARY EMPHASIS AREAS



Team identified six emphasis areas for the LRSP:

Emphasis Areas
Vehicle Speeds
Distracted Drivers
Roadway and Shoulder Conditions <i>(To address both vehicles maintaining road and physical infrastructure, including fixed objects - i.e., trees)</i>
Pedestrians & Bicyclists & Equestrians <i>(non-motorized modes)</i>
Intersection Safety
Wildlife/Deer

Safety data analysis

- Advantage: GDOT statewide crash database (GEARS)
- High-crash intersections (signalized and non-signalized)
- High-crash corridors



Safety data analysis

- Crash types



Safety data analysis

- Contributing factors



Safety data analysis

- Weather



Safety data analysis

- Crash severity



Safety data analysis

- Time of day



Safety data analysis

- Day of week



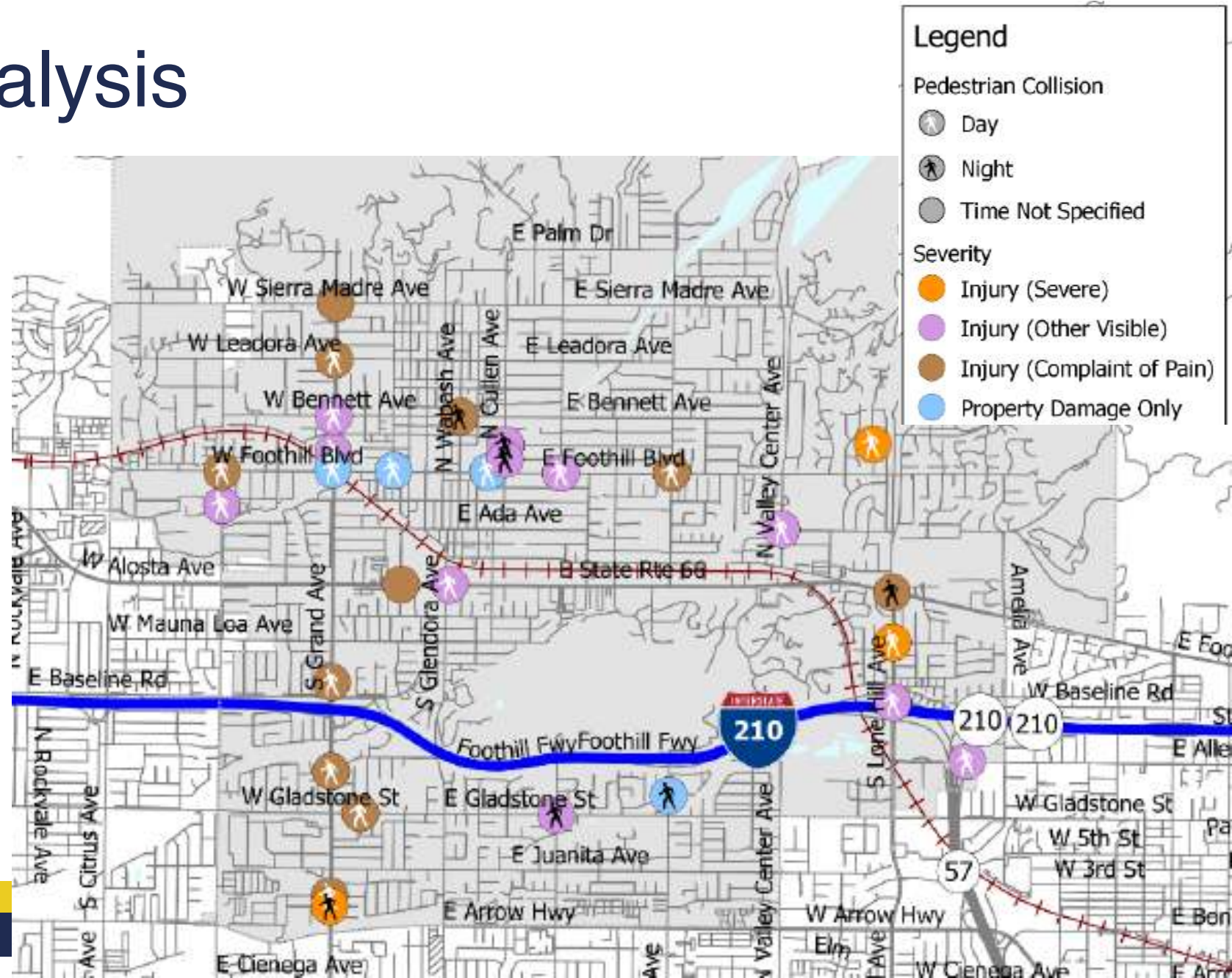
Safety data analysis

- Time of year



Safety data analysis

- Pedestrian crashes

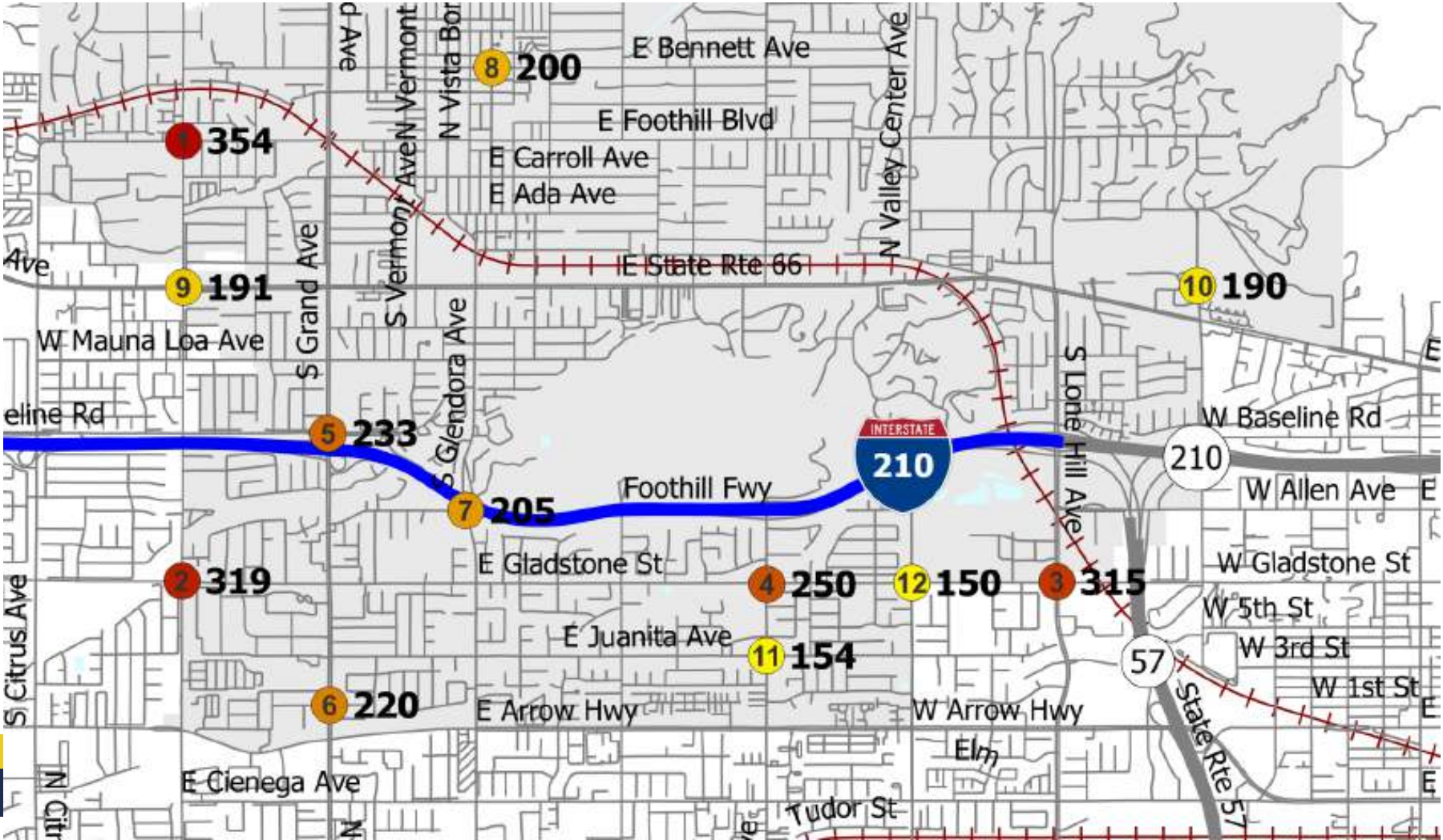


Safety data analysis

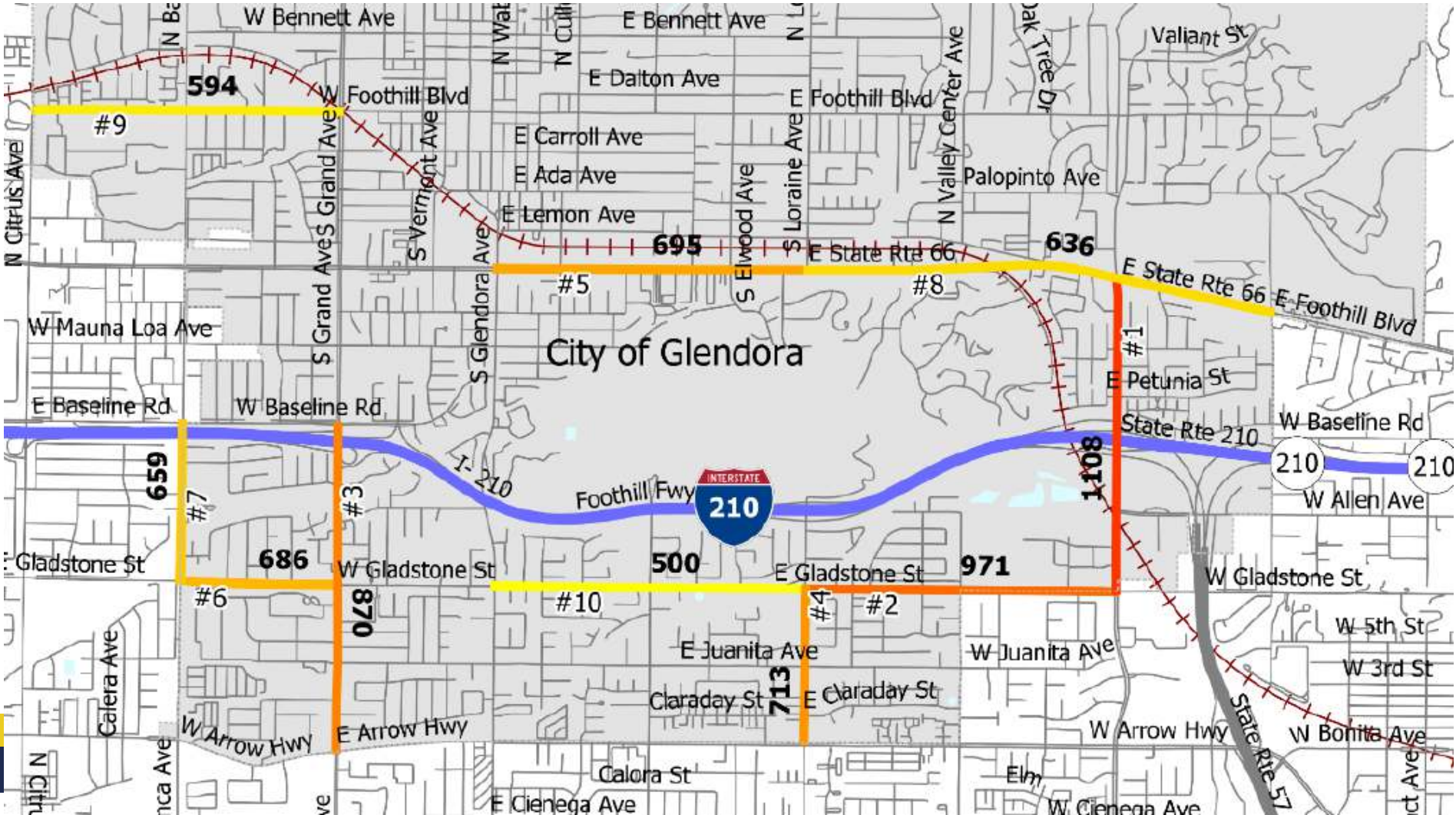
- Bicycle crashes



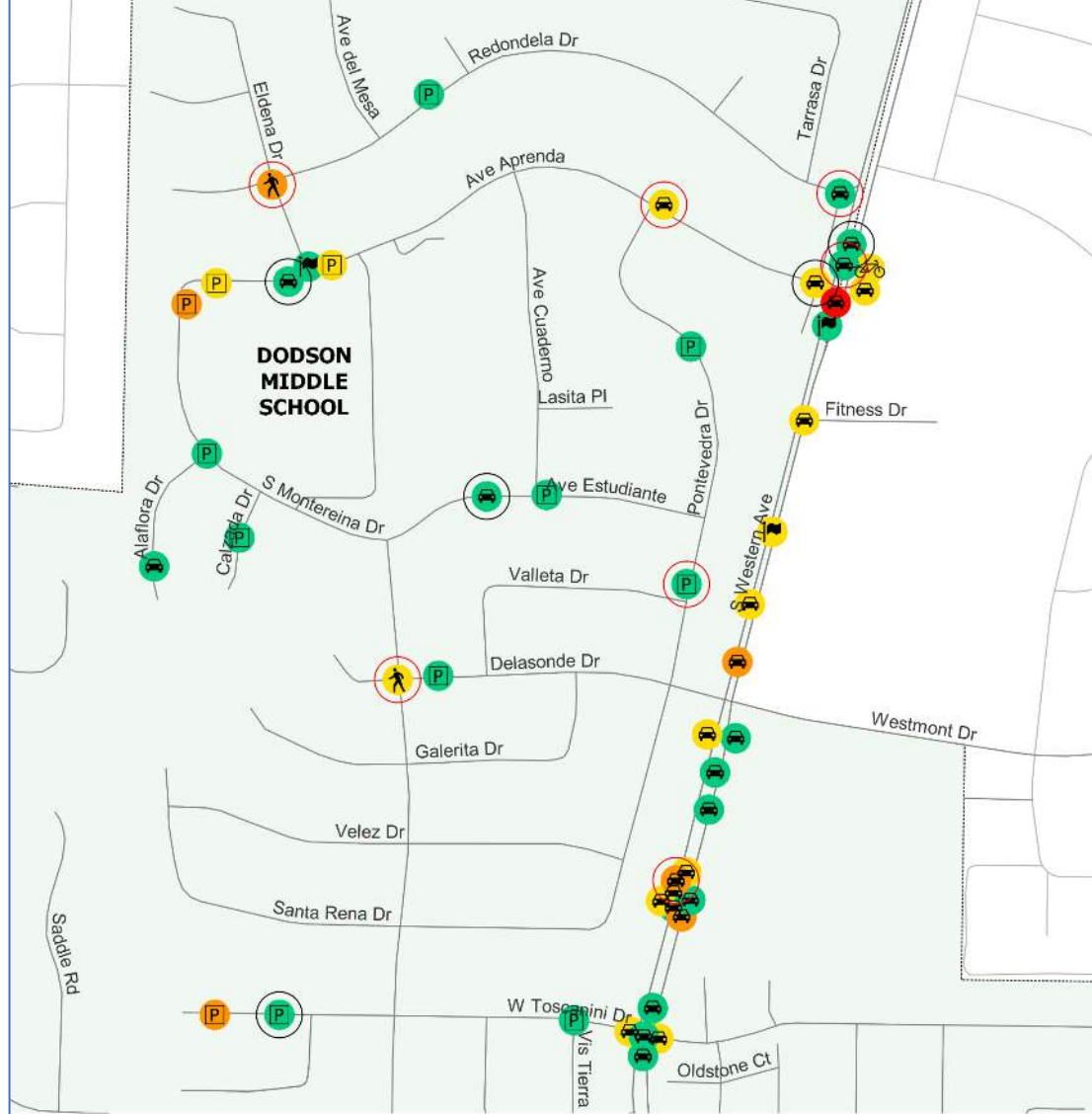
Identify high-crash intersections



Identify high-crash corridors

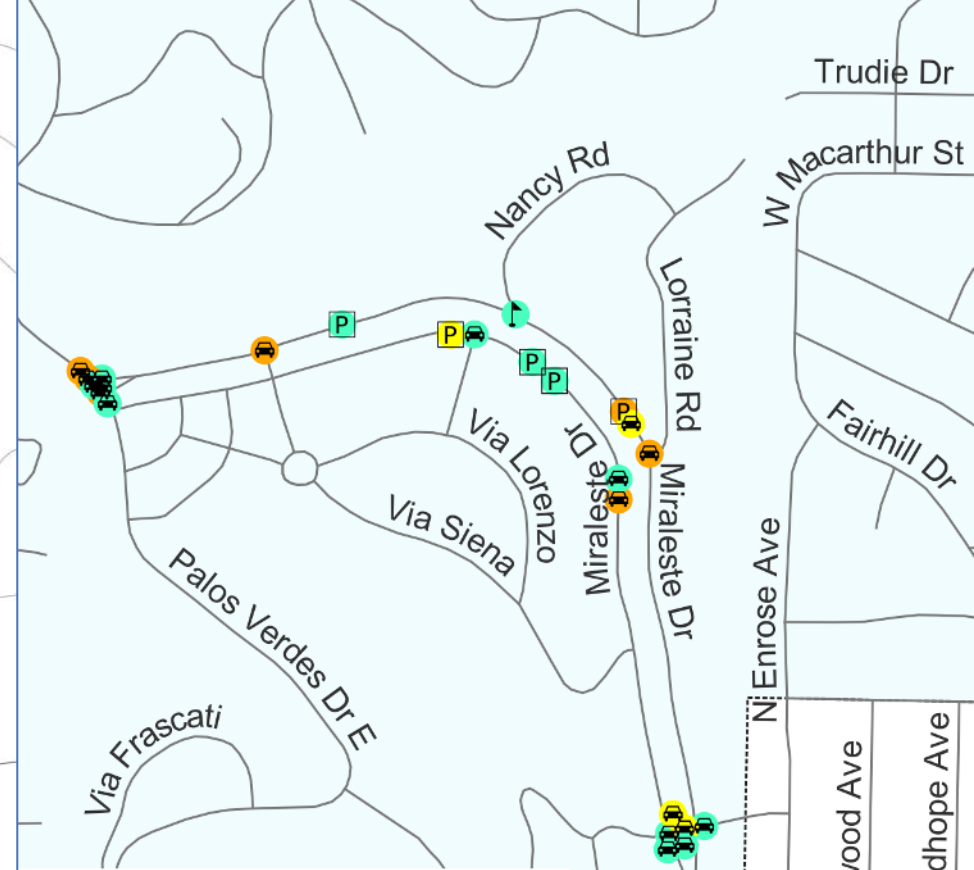
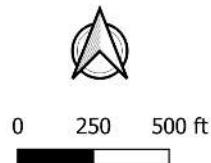


Data Visualization



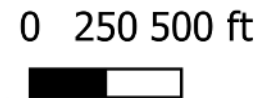
Legend

- | | | |
|-----------------------|--------------------------|----------------------------|
| City Boundary | Crash Involvement | During AM Peak (7:15-8:15) |
| Crash Severity | Parked Motor Vehicle | During PM Peak (2:45-3:45) |
| Severe Injury | Other Motor Vehicle | |
| Other Visible Injury | Fixed Object | |
| Complaint of Pain | Pedestrian | |
| Property Damage Only | Bicycle | |



Miraleste Dr Crashes 2017-22

- Fixed Object
- Other Motor Vehicle
- Parked Motor Vehicle
- Other Visible Injury
- Complaint of Pain
- Property Damage Only
- City Boundary



Countermeasures

About the Proven Safety Countermeasures Initiative (PSCi)

In 2008, FHWA began promoting widespread use of certain infrastructure-oriented safety treatments and strategies that can offer significant, measurable impacts as part of any agency's data-driven, systemic approach to improving safety. FHWA updated the PSCi in 2012, 2017, and 2021, reaching a current total of 28 PSCs. The cumulative list is diverse and broad, and practitioners can implement PSCs to successfully address a variety of crash types and focus areas like speed management, roadway departure, intersection, pedestrian, and bicyclist crashes to save lives and prevent serious injuries.

Countermeasures

SPEED MANAGEMENT



Speed Safety
Cameras



Variable Speed Limits



Appropriate Speed
Limits for All Road
Users

ROADWAY DEPARTURE



Wider Edge Lines



Enhanced Delineation
for Horizontal Curves



Longitudinal Rumble
Strips and Stripes



SafetyEdgeSM



Roadside Design
Improvements at
Curves



Median Barriers

Countermeasures

INTERSECTIONS



Backplates with
Reflective Borders



Corridor Access
Management



Left- and Right-Turn
Lanes at Two-Way
Stop-Controlled
Intersections



Reduced Left-Turn
Conflict Intersections



Roundabouts



Systemic Application
of Multiple Low Cost
Countermeasures at
Stop-Controlled
Intersections



Yellow Change
Intervals

Countermeasures

PEDESTRIAN/BICYCLIST



Crosswalk Visibility Enhancements



Bicycle Lanes



Rectangular Rapid Flashing Beacons



Leading Pedestrian Interval



Medians and Pedestrian Refuge Islands in Urban and Suburban Areas



Pedestrian Hybrid Beacons



Road Diets (Roadway Reconfiguration)



Walkways

Speed Safety Cameras

- Fixed units—a single, stationary camera targeting one location.
- Point-to-Point (P2P) units—multiple cameras to capture average speed over a certain distance.
- Mobile units—a portable camera, generally in a vehicle or trailer.

Table of selection considerations for SSC deployment.

Considerations for Selection	Fixed	P2P	Mobile
Problems are long-term and site-specific.	X	X	
Problems are network-wide, and shift based on enforcement efforts.			X
Speeds at enforcement site vary largely from downstream sites.		X	X
Overt enforcement is legally required.	X	X	X
Sight distance for the enforcement unit is limited.	X	X	
Enforcement sites are multilane facilities.	X	X	



Safety Benefits:

Fixed units can reduce crashes on urban principal arterials up to:⁴

54%

for all crashes.

47%

for injury crashes.

P2P units can reduce crashes on urban expressways, freeways, and principal arterials up to:

37%

for fatal and injury crashes.²

Speed Safety Cameras

- Can produce crash reduction upstream and downstream, generating a spillover effect
- SSCs can offer fair and equitable enforcement of speeding, regardless of driver age, race, gender, or socio-economic status
- Using both overt (i.e., highly visible) and covert (i.e., hidden) enforcement may encourage drivers to comply with limits everywhere, not only at sites they are aware are enforced
- Agencies should conduct a legal and policy review to determine if SSCs are authorized within a jurisdiction and how the authorization and other traffic laws will affect a SSC program

Mobile units can reduce crashes on urban principal arterials up to:

20%

for fatal and injury crashes.⁵

In New York City, fixed units reduced speeding in school zones up to 63% during school hours.⁶



After 30,000 tickets, speed cameras draw backlash from drivers who call them a 'money grab'

By Rob DiRienzo | Published May 4, 2021 | Snellville | FOX 5 Atlanta

Jason Bramlett said opening the mailbox and finding a speeding ticket has become somewhat of a routine.

"Every day we'll come home and we'll be like, hey, got another one," Bramlett said. He said he got two tickets and a warning about speeding in the town. Bramlett thinks it's not about safety, but using the technology to cash in.

On the other hand, Snellville resident Woodrow Gaines, who also runs a teen safety driving course, thinks the camera are a good way to get people to slow down.

"They just don't care," Gaines said. "Somebody's life depends on us being conscious about what we're doing when we're behind the wheel."



If hit by a car traveling:

● Fatality ● Person survives collision



20 MPH

5%



30 MPH

45%



40 MPH

85%

National Traffic Safety Board (2017) Reducing Speeding-Related Crashes Involving Passenger Vehicles. Available from: <https://www.nts.gov/safety/safety-studies/Documents/SS1701.pdf>

Variable Speed Limits

- Particularly effective on urban and rural freeways and high-speed arterials with posted speed limits greater than 40 mph.
- Often implemented as part of Active Traffic Management (ATM) plans or incorporated into existing Road Weather Information Systems.
- When used with ATM, VSLs can mitigate rear-end, sideswipe, and other crashes on high-speed roadways.
- May be implemented as a regulatory and/or an advisory system.
- Can be applied to an entire roadway segment or individual lanes.



CONGESTION



INCIDENTS



WORK ZONES



INCLEMENT
WEATHER



Safety Benefits:

**VSLs can reduce crashes
on freeways up to:¹**

34%

for total crashes.

65%

for rear-end crashes.

51%

for fatal and injury crashes.

**Benefit/Cost Ratios
range between¹**

9:1 - 40:1

Our best deal.

Subscribe now and get 6 months for 99¢.

Drivers confused by variable speeds on I-285

LOCAL NEWS

By Andria Simmons

Oct 16, 2014

- The new variable speed limit signs on the top end of I-285 rise and fall between 65 mph and 35 mph, and most drivers find them confusing, annoying or worse.
- “Shame on whoever approved this!” said Atlanta resident Ari Jones, who travels on the Perimeter to Sandy Springs for work each day. “It’s just mass chaos.”
- “It’s not working and is a total waste,” said Peter Sway, who found plenty of company among AJC Facebook commenters this week. Only three of 78 people had good things to say about the signs, which have been up for 10 days.

Appropriate Speed Limits for All Road Users

- Speed limits in some areas are too high
- The Official Code of Georgia Annotated (§40-6-183) permits cities and counties to decrease the speed limit on local roads in urban or residential areas to as low as 25 mph (in other areas, the lowest permitted speed limit is 30 mph).
- Any speed limit change on a local road must be done “on the basis of an engineering and traffic investigation.”
- Cities and counties may request GDOT to conduct speed-limit reviews on state and federal roads within their communities.



Safety Benefits:

Traffic fatalities in the City of Seattle decreased 26 percent after the city implemented comprehensive, city-wide speed management strategies and countermeasures inspired by Vision Zero. This included setting speed limits on all non-arterial streets at 20 mph and 200 miles of arterial streets at 25 mph. ⁵

Wider Edge Lines

- Increase from the standard 4 inches to the maximum of 6 inches
- Agencies should consider implementing a systemic approach to wider edge line installation based on roadway departure crash risk factors.
- Consider pavement width, presence of curves, traffic volumes, nighttime crashes
- As the number of automated vehicles increases on roadways, wider edge lines may provide better guidance for these vehicles' sensors.

12.2 Pavement Markings

12.2.1 Edge lines

Edge lines shall be placed on all paved roadways, including curb and gutter sections. When the width of a roadway with curb and gutter exceeds the normal distance from face of gutter to face of gutter for the number of travel lanes, the edge line shall be placed the appropriate distance from the centerline markings based on a lane width of 12 feet. Edge lines shall not be placed on roadways with curb and gutter if parallel or angle parking is permitted.



Safety Benefits:

Wider edge lines can reduce crashes up to:

37%

for non-intersection, fatal and injury crashes on rural, two-lane roads.²

22%

for fatal and injury crashes on rural freeways.³

Benefit-Cost Ratio

25:1

for fatal and serious injury crashes on two-lane rural roads.⁴



SafetyEdgeSM

- The SafetyEdge technology shapes the edge of the pavement at approximately 30 degrees from the pavement cross slope during the paving process. This safety practice eliminates the potential for vertical drop-off at the pavement edge.
- Can improve pavement durability by reducing edge raveling of asphalt
- Rural road crashes involving edge drop-offs are 2-4 times more likely to include a fatality than other crashes on similar roads.
- Exposed vertical pavement edges can cause vehicles to become unstable and prevent their safe return to the roadway.



Safety Benefits:

11%

reduction in fatal and injury crashes.²

21%

reduction in run-off-road crashes.²



Example of the SafetyEdgeSM after backfill material settles or erodes. Source: FHWA

Roadside Design Improvements at Curves

- Clear zones
- Slope flattening
- Adding or widening shoulders
- Cable barriers
- Metal-beam guardrails
- Concrete barriers



Safety Benefits:

**Flatten sideslope
from 1V:3H to 1V:4H:**

8%

reduction for
single-vehicle crashes.²

**Flatten sideslope
from 1V:4H to 1V:6H:**

12%

reduction for
single-vehicle crashes.²

**Increase the distance
to roadside features
from 3.3 ft to 16.7 ft:**

22%

reduction for all crashes.³

Rumble strips and stripes

- Longitudinal rumble strips are milled or raised elements on the pavement intended to alert drivers through vibration and sound that their vehicle has left the travel lane.
- Rumble stripes are edge line or center line rumble strips where the pavement marking is placed over the rumble strip. This can increase the visibility and durability of the pavement marking during wet, nighttime conditions, and can improve the durability of the marking on roads with snowplowing operations.
- Relatively low-cost
- Where noise concerns preclude rumble strips, another options is “mumble strips” – using an oscillating sine wave pattern, reduces noise outside the vehicle



Safety Benefits:

Center Line Rumble Strips

44-64%

reduction in head-on fatal and injury crashes on two-lane rural roads.⁴

Shoulder Rumble Strips

13-51%

reduction in single vehicle, run-off-road fatal and injury crashes on two-lane rural roads.⁴





Your Voice for a Bicycle Friendly Georgia

[HOME](#) [NEWS](#) [ABOUT US](#) ▾ [EVENTS CALENDAR](#) ▾ [RESOURCES](#) ▾ [SUPPORT GEORGIA BIKES](#) ▾

Search...



Form now available for reporting problematic rumble strips

Georgia Bikes is working with the [Georgia Department of Transportation](#) to identify state-maintained roads which can be improved to make them safer and more comfortable for people who ride bikes by correcting problematic rumble strips. Solutions could include the addition of rideable shoulders.

We have created a form which problematic rumble strips can be reported. Working with GDOT we will attempt to have the problems addressed during resurfacing and other road construction and maintenance projects.

The reporting form page also includes resources from the the [Adventure Cycling Association](#) covering best practices and design guidelines that support bicyclist safety when installing rumble strips. We will be working with ACA and other partners – in addition to GDOT – on improving design standards and implementation outreach.

[Report a Rumble Strip Problem](#)

Median Barriers

- Cable barriers
- Metal-beam guardrails
- Concrete barriers



8%

of all fatalities on divided highways are due to head-on crashes.¹

Safety Benefits:

**Median Barriers Installed
on Rural Four-Lane
Freeways**

97%

reduction in
cross-median crashes.²

Lifesaving cable barriers coming to I-20, I-520 medians in Georgia



This image from the Georgia Department of Transportation shows a cable barrier. (WRDW)

By Steve Byerly

Published: Aug. 4, 2020 at 9:29 AM EDT



Backplates with Retroreflective Borders

- Makes the signal head more conspicuous
- Can be especially helpful for older and color vision deficient drivers
- Also advantageous during periods of power outages when the signals would otherwise be dark



Safety Benefits:

15%

reduction in total crashes.¹



Help preserve local news. Support Baldwin2K.

SUPPORT

Milledgeville GA

8-11-2022 11:27am

441 and Meriwether/Corral roads intersection in the middle of a DOT makeover



Christian McKearney Editor



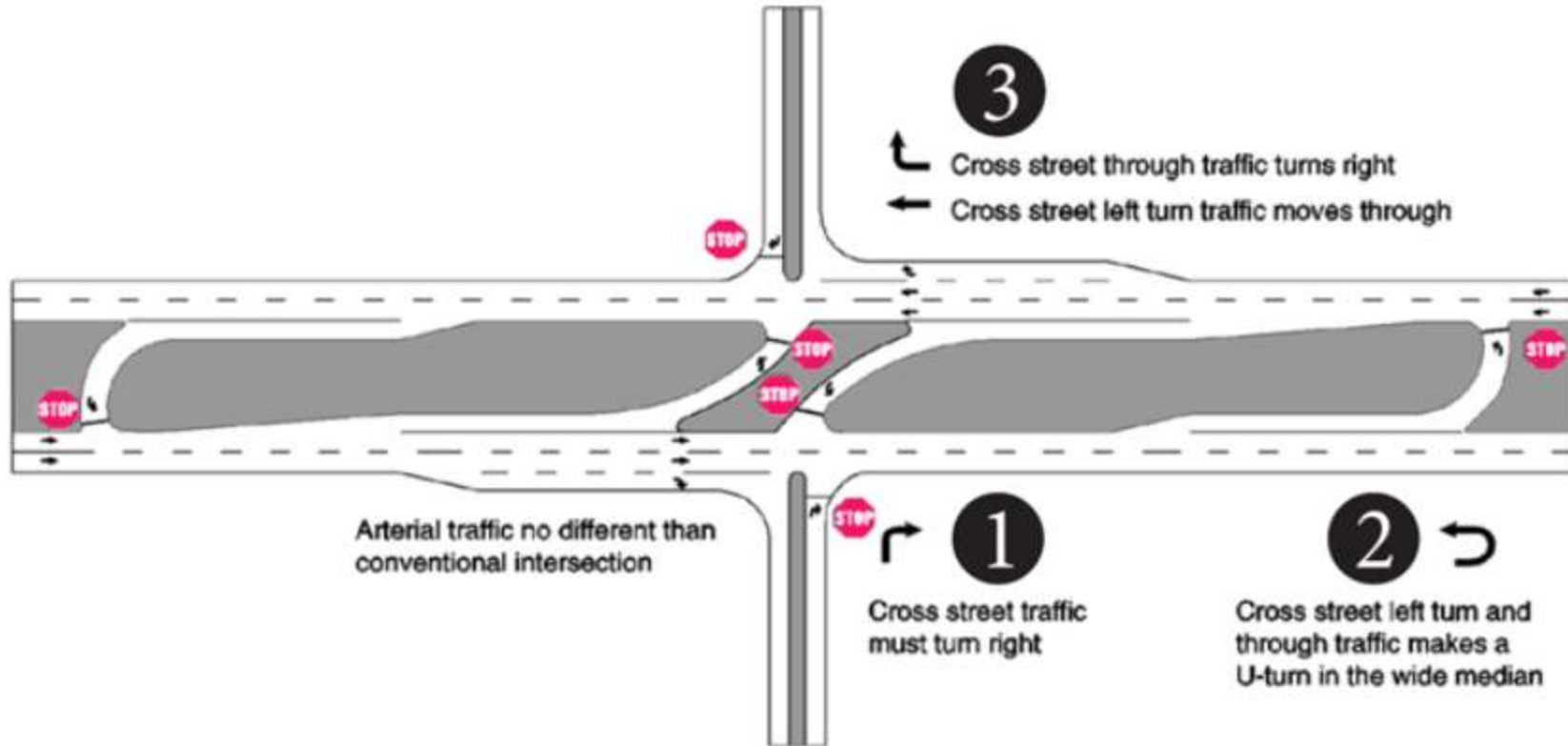
Signal backplate framed with a retroreflective border. Source: FHWA

The new traffic lights are structurally heavier, and they can't be supported by cross wires. DOT plans to hang the new traffic lights from "metal arms," similar to the ones in downtown Milledgeville (see below). The idea is that this also will help out with out-of-town traffic recognizing the intersection.



Reduced Left-Turn Conflict Intersections

- Restricted crossing U-turn



Example of a unsignalized RCUT intersection. Source: FHWA

Safety Benefits:

RCUT

Two-Way Stop-Controlled to RCUT:

54%

reduction in fatal and injury crashes.²

Signalized Intersection to Signalized RCUT:

22%

reduction in fatal and injury crashes.³

Unsignalized Intersection to Unsignalized RCUT:

63%

reduction in fatal and injury crashes.⁴

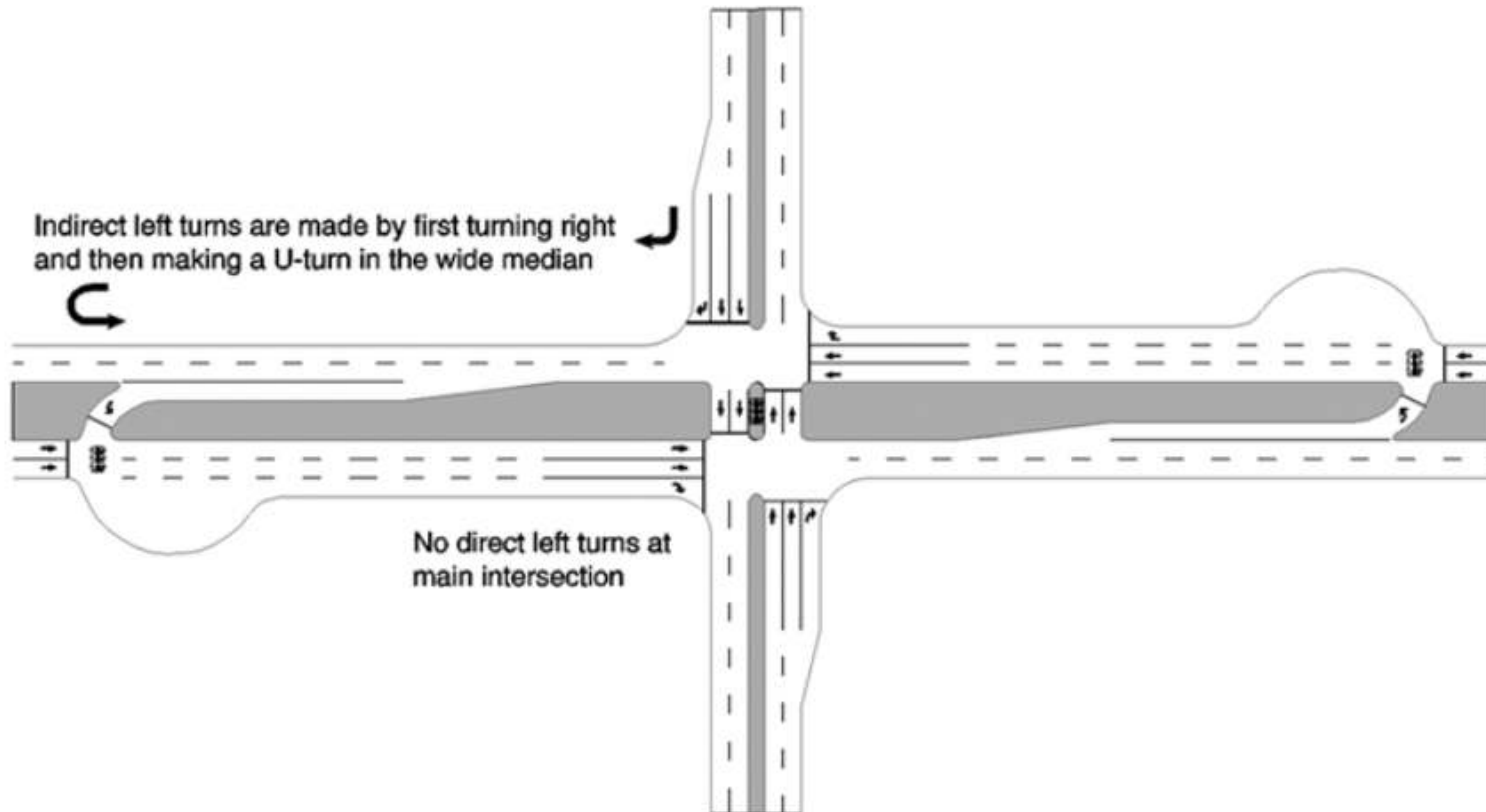
MUT

30%

reduction in intersection-related injury crash rate.⁵

Reduced Left-Turn Conflict Intersections

- Median U-turn



Example of a MUT intersection. Source: FHWA

Safety Benefits:

RCUT

Two-Way Stop-Controlled to RCUT:

54%

reduction in fatal and injury crashes.²

Signalized Intersection to Signalized RCUT:

22%

reduction in fatal and injury crashes.³

Unsignalized Intersection to Unsignalized RCUT:

63%

reduction in fatal and injury crashes.⁴

MUT

30%

reduction in intersection-related injury crash rate.⁵

Yellow Change Intervals

- Too brief an interval may result in drivers being unable to stop safely and cause unintentional red-light running.
- Too long of an interval may result in drivers treating the yellow as an extension of the green phase and invite intentional red-light running.
- Factors such as the speed of approaching and turning vehicles, driver perception-reaction time, vehicle deceleration, and intersection geometry should all be considered in the timing calculation.



Safety Benefits:

36-50%

reduction in red-light running.²

8-14%

reduction in total crashes.²

12%

reduction in injury crashes.²

Corridor Access Management

- The following access management strategies can be used individually or in combination with one another:
- Reduce density through driveway closure, consolidation, or relocation.
- Manage spacing of intersection and access points.
- Limit allowable movements at driveways (such as right-in/right-out only).
- Place driveways on an intersection approach corner rather than a receiving corner, which is expected to have fewer total crashes.²
- Implement raised medians that preclude across-roadway movements.
- Utilize designs such as roundabouts or reduced left-turn conflicts (such as restricted crossing U-turn, median U-turns, etc.).
- Provide turn lanes (i.e., left-only, right-only, or interior two-way left).
- Use lower speed one-way or two-way off-arterial circulation roads.



Safety Benefits:

**Reducing driveway
density**

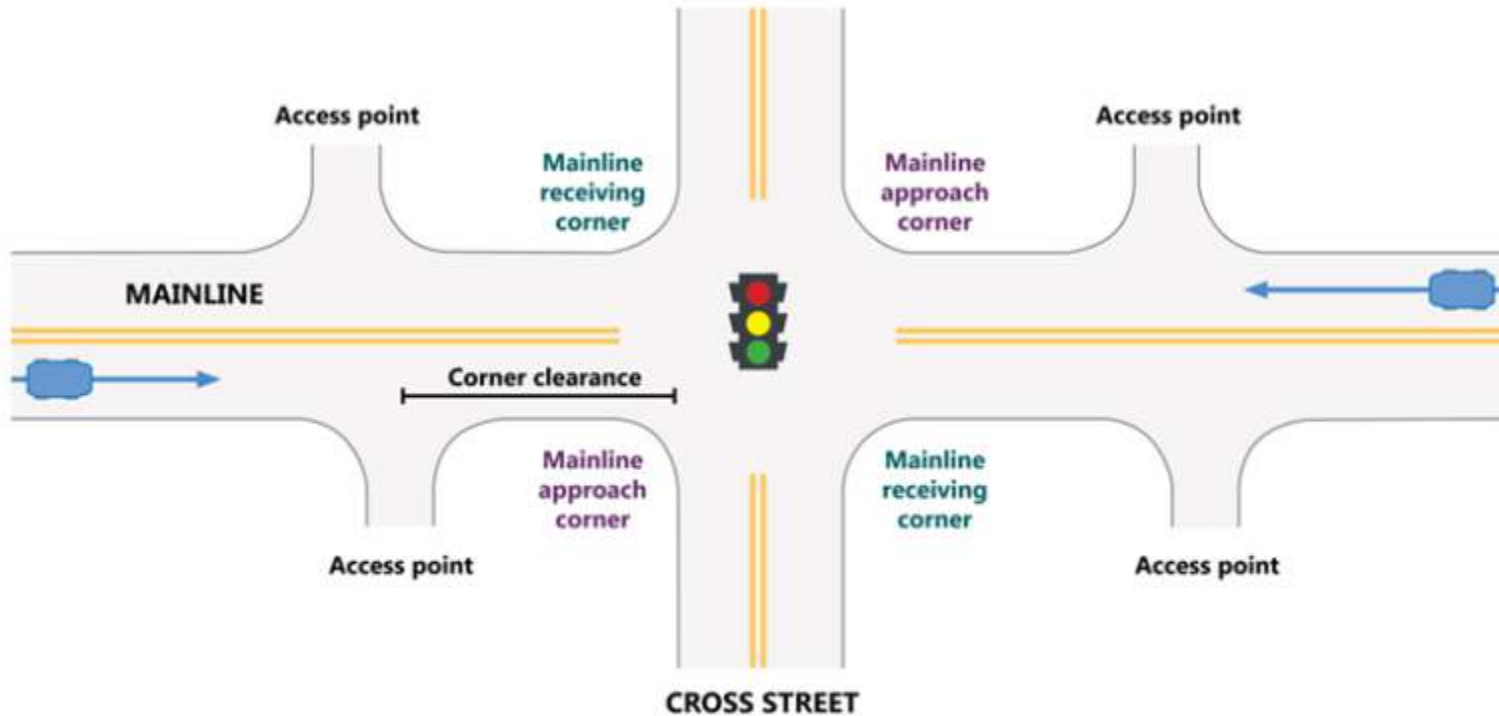
5-23%

reduction in total crashes along
2-lane rural roads.³

25-31%

reduction in fatal and injury
crashes along urban/suburban
arterials.⁴

Corridor Access Management



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



Safety Benefits:

**Reducing driveway
density**

5-23%

reduction in total crashes along
2-lane rural roads.³

25-31%

reduction in fatal and injury
crashes along urban/suburban
arterials.⁴

Corridor Access Management



Tandem roundabouts with a continuous raised median eliminates left-turn and across-roadway conflicts. Source: FHWA



Safety Benefits:

**Reducing driveway
density**

5-23%

reduction in total crashes along
2-lane rural roads.³

25-31%

reduction in fatal and injury
crashes along urban/suburban
arterials.⁴

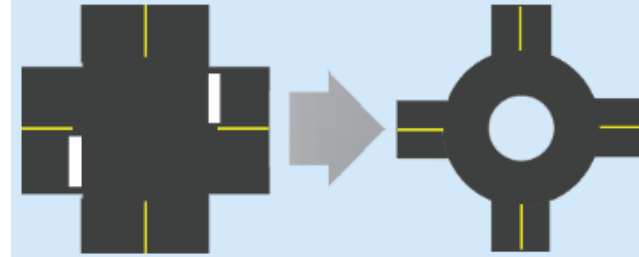
Roundabouts



Illustration of a multi-lane roundabout. Source: FHWA

Safety Benefits:

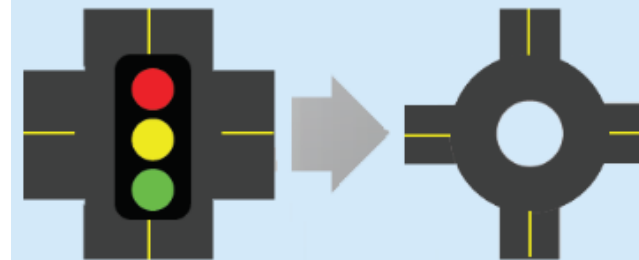
**Two-Way Stop-Controlled
Intersection to a
Roundabout**



82%

Reduction in fatal
and injury crashes¹

**Signalized Intersection to
a Roundabout**



78%

Reduction in fatal
and injury crashes¹

Roundabouts

Driving in circles

October 25, 2010 at 10:00 a.m. | Updated October 25, 2010 at 10:00 a.m.

by [Adam Crisp](#)

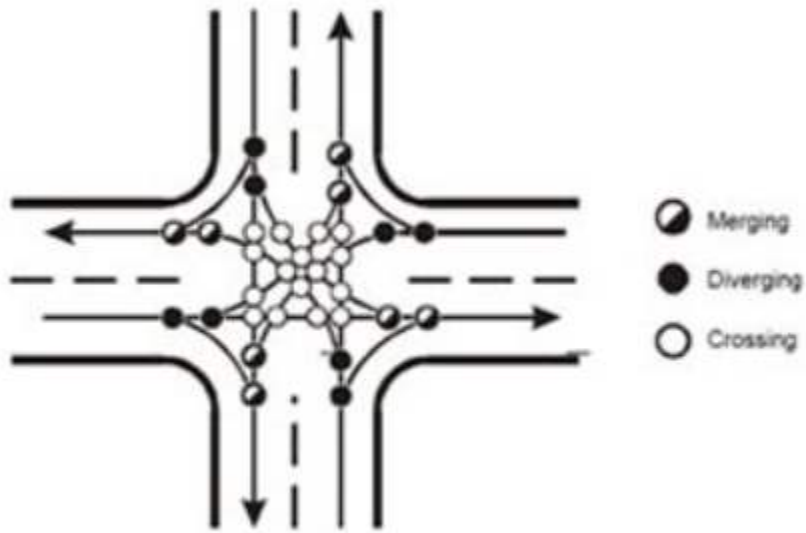


- “The idea didn't sit well with Whitfield County commissioners, who reluctantly agreed to have the circles installed...”

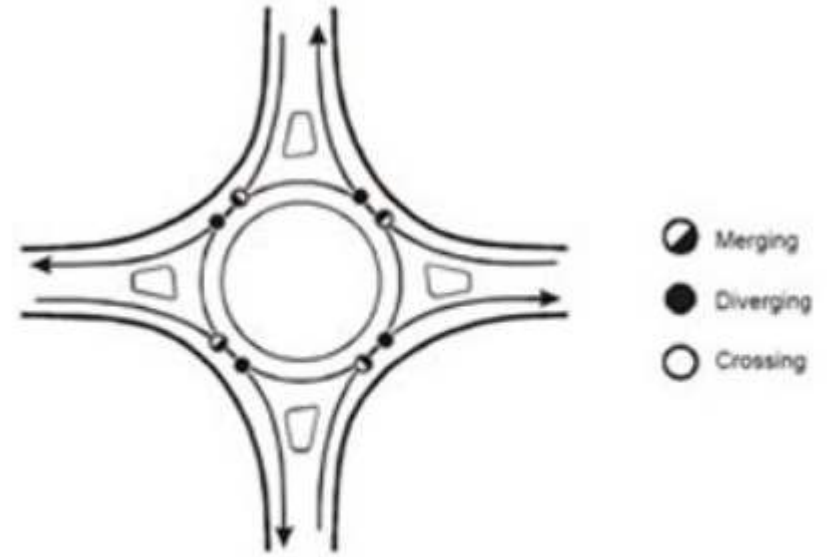
"I'm still concerned about the installation of a roundabout, just from a safety standpoint," Commissioner Randy Waskul said at a recent County Commission meeting. "Can't we just install a stop light? ... Wouldn't that be a whole lot easier?"



Roundabouts



32 conflict points at four-way intersections



Reduction of conflict points with roundabouts

Roundabouts

Drivers in Peachtree Corners finding roundabout not so bad after all

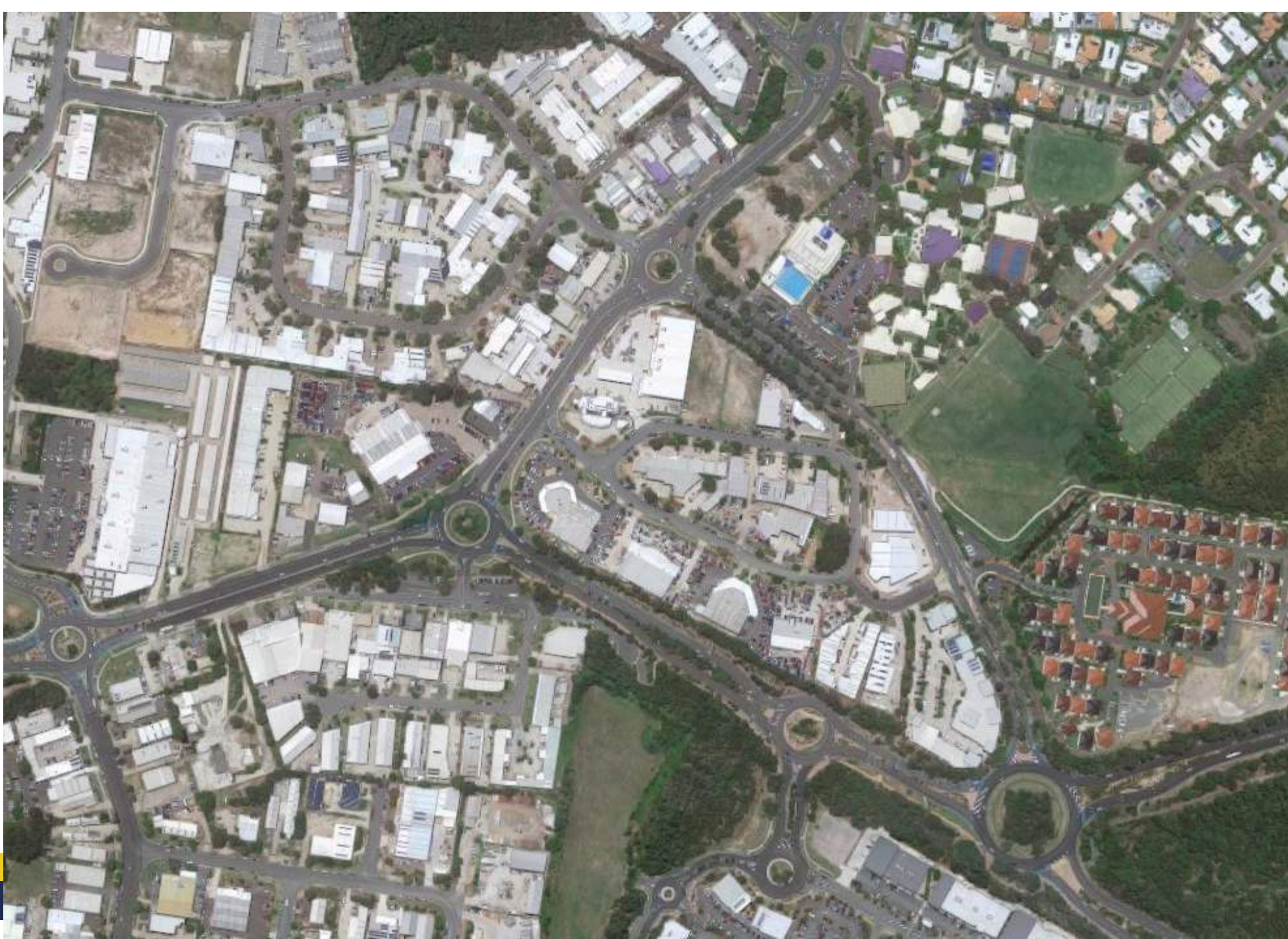


GWINNETT COUNTY

By Karen Huppertz for the AJC

Dec 16, 2021







Dedicated Turn Lanes



Safety Benefits:

Left-Turn Lanes

28-48%

reduction in total crashes.¹

**Positive Offset
Left-Turn Lanes**

36%

reduction in fatal and injury
crashes.²

Right-Turn Lanes

14-26%

reduction in total crashes.¹

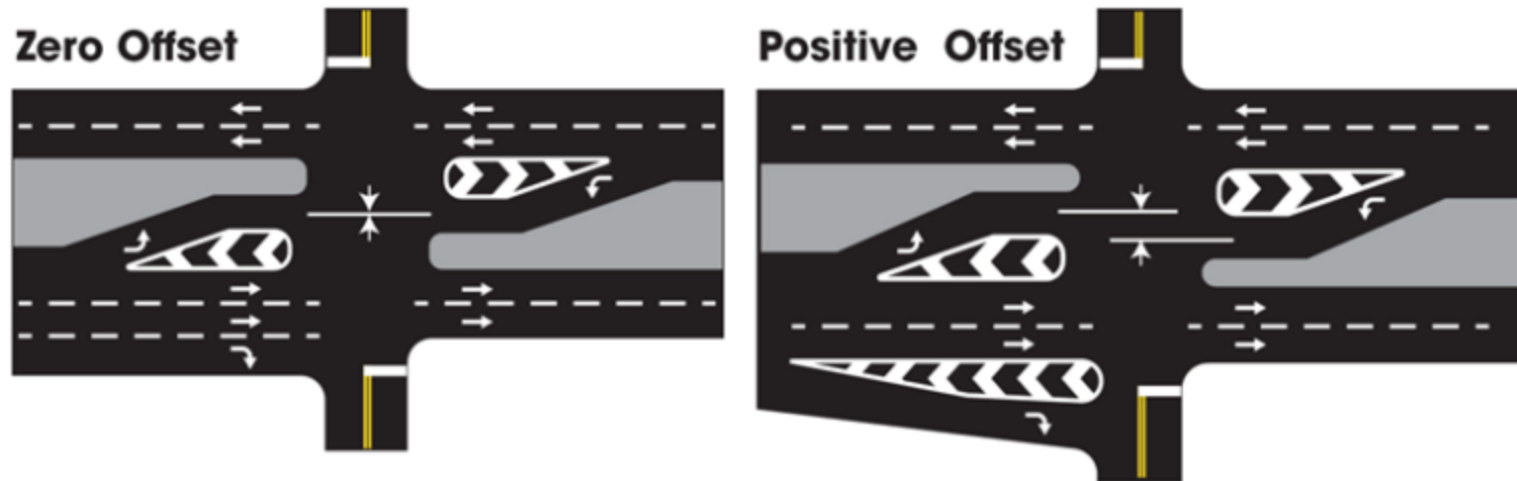


Illustration comparing zero offset to positive offset of left- and right-turn lanes.

Source: FHWA

Systemic Application of Multiple Low-Cost Countermeasures at Stop-Controlled Intersections

On the Through Approach

- Doubled-up (left and right), oversized advance intersection warning signs, with supplemental street name plaques (can also include flashing beacon).
- Retroreflective sheeting on sign posts.
- Enhanced pavement markings that delineate through lane edge lines.

Safety Benefits:

10%

reduction of fatal and injury crashes at all locations/types/areas.

15%

reduction of nighttime crashes at all locations/types/areas.

27%

reduction of fatal and injury crashes at rural intersections.

19%

reduction of fatal and injury crashes at 2-lane by 2-lane intersections.

Average Cost-Benefit Ratio

12:1

Systemic Application of Multiple Low-Cost Countermeasures at Stop-Controlled Intersections

On the Stop Approach

- Doubled-up (left and right), oversized advance "Stop Ahead" intersection warning signs (can also include flashing beacon).
- Doubled-up (left and right), oversized Stop signs.
- Retroreflective sheeting on sign posts.
- Properly placed stop bar.
- Removal of vegetation, parking, or obstructions that limit sight distance.
- Double arrow warning sign at stem of T-intersections.

Safety Benefits:

10%

reduction of fatal and injury crashes at all locations/types/areas.

15%

reduction of nighttime crashes at all locations/types/areas.

27%

reduction of fatal and injury crashes at rural intersections.

19%

reduction of fatal and injury crashes at 2-lane by 2-lane intersections.

Average Cost-Benefit Ratio

12:1

Crosswalk Visibility Enhancements



Source: FHWA



Safety Benefits:

High-visibility crosswalks can reduce pedestrian injury crashes up to

40%¹

Intersection lighting can reduce pedestrian crashes up to

42%²

Advance yield or stop markings and signs can reduce pedestrian crashes up to

25%³

Leading Pedestrian Interval



An LPI allows a pedestrian to establish a presence in the crosswalk before vehicles are given a green indication. Source: FHWA



Safety Benefit:

13%

reduction in pedestrian-vehicle crashes at intersections.¹

Traffic Signals on Peachtree Street Corridor Adjusted to Improve Ped Safety



Peachtree Street in Midtown Atlanta is heavily used by pedestrians, and many of the intersections off Peachtree have high percentages of turning traffic, where cars can conflict with pedestrians. Working with the City of Atlanta and the Georgia Department of Transportation, Midtown Alliance recently installed new traffic signal sequencing to enhance safety for pedestrians at eleven intersections along Peachtree Street between 3rd Street and 17th Street. This project is part of the Midtown Traffic Operations Program (MTO), a multi-faceted effort to create efficiencies that have reduced peak travel times in major Midtown corridors over the past two years.

Road Diets

Benefits of Road Diet installations may include:

- Reduction of rear-end and left-turn crashes due to the dedicated left-turn lane.
- Reduced right-angle crashes as side street motorists cross three versus four travel lanes.
- Fewer lanes for pedestrians to cross.
- Opportunity to install pedestrian refuge islands, bicycle lanes, on-street parking, or transit stops.
- Traffic calming and more consistent speeds.
- A more community-focused, Complete Streets environment that better accommodates the needs of all road users.



Safety Benefits:

**4-Lane to 3-Lane,
Road Diet Conversions**

19-47%

reduction in total crashes.¹



In car-obsessed Atlanta, does Peachtree Street's pedestrian-friendly transformation have legs?

The city planning department's Shared Street program, which closes two lanes of Peachtree Street to allow for more pedestrian traffic, started this week

BY SEAN KEENAN - JUNE 23, 2021



As part of the Shared Street project, two lanes of Peachtree between Baker and Ellis will be blocked off to cars, allowing for greater pedestrian traffic.

Bicycle Lanes



Safety Benefits:

**Bicycle Lane Additions
can reduce crashes up to:**

49%

for total crashes on urban 4-lane
undivided collectors and local
roads.⁶

30%

for total crashes on urban 2-lane
undivided collectors and local
roads.⁶

Separated bicycle lanes may
provide further safety benefits.
FHWA is anticipating completion
of research in Fall 2022.

[ADVERTISE WITH US](#)[11ALIVE INVESTIGATES](#)[VOICES FOR EQUALITY](#)[LOCKED ON SPC](#)

Atlanta City Council passes resolution aiming to crack down on cars parked in bike lanes

The resolution had been sponsored by 13 of the 15 members of the City Council.

11alive.com



Medians and Pedestrian Refuge Islands



Example of a road with a median and pedestrian refuge islands.

Source: City of Charlotte, NC



Safety Benefits:

Median with Marked Crosswalk

46%

reduction in pedestrian crashes.²

Pedestrian Refuge Island

56%

reduction in pedestrian crashes.²

Sidewalks / Walkways

- Includes paved shoulders and shared-use paths



Paved shoulder used as a walkway. Source: pedbikeimages.org / Burden



Safety Benefits:

Sidewalks

65-89%

reduction in crashes involving pedestrians walking along roadways.³

Paved Shoulders

71%

reduction in crashes involving pedestrians walking along roadways.³

Rectangular Rapid Flashing Beacons (RRFB)



Safety Benefits:

RRFBs can reduce crashes up to:

47%

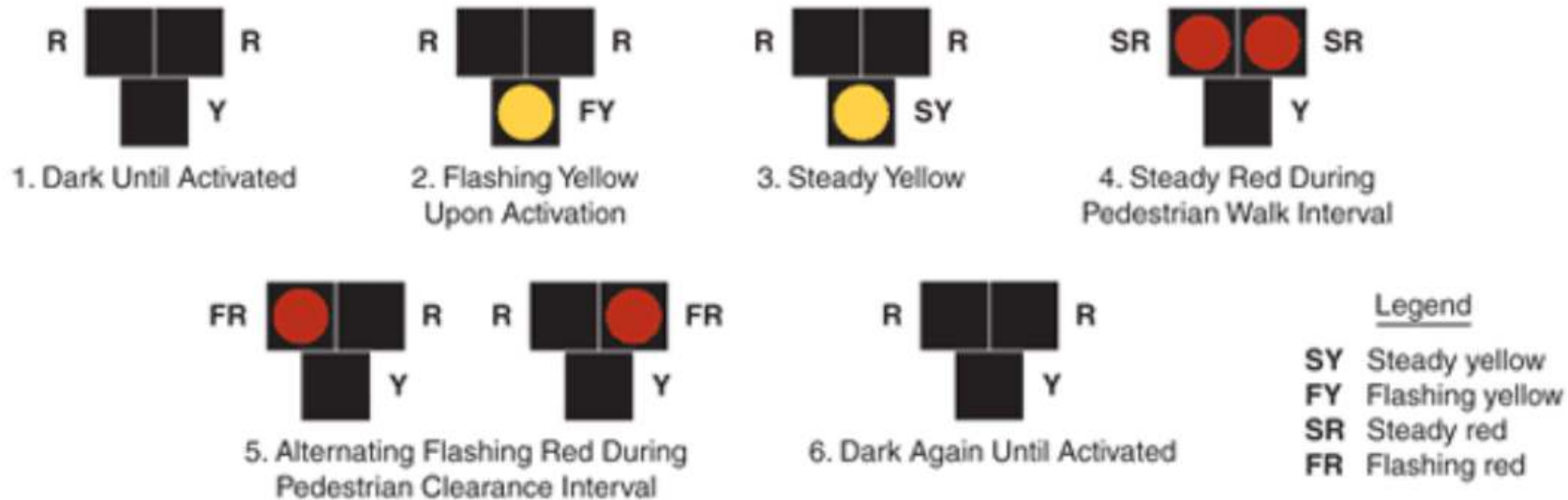
for pedestrian crashes.⁴

RRFBs can increase motorist yielding rates up to:

98%

(varies by speed limit, number of lanes, crossing distance, and time of day).³

Pedestrian Hybrid Beacons



Sequence for a PHB. Source: [MUTCD 2009 Edition, Chapter 4F](#), FHWA



Safety Benefits:

55%

reduction in pedestrian crashes.²

29%

reduction in total crashes.³

15%

reduction in serious injury and fatal crashes.³



ADVERTISE WITH US

11ALIVE INVESTIGATES

VOICES FOR EQUALITY

LOCKED ON SPORTS

COMMUTER DUDE

What to do when you see those confusing new crosswalk lights in Atlanta

—



Pavement Friction Management

HFST should be applied in locations with increased friction demand, including:

- Horizontal curves.
- Interchange ramps.
- Intersection approaches.
- Higher-speed signalized and stop-controlled intersections.
- Steep downward grades.
- Locations with a history of rear-end, failure to yield, wet-weather, or red-light-running crashes.
- Crosswalk approaches.



Safety Benefits:

**HFST can reduce
crashes up to:**

63%

for injury crashes at ramps.²

48%

for injury crashes at horizontal
curves.²

20%

for total crashes at
intersections.³

Road Safety Audit

RSAs provide the following benefits:

- Reduced number and severity of crashes due to safer designs.
- Reduced costs resulting from early identification and mitigation of safety issues before projects are built.
- Increased opportunities to integrate multimodal safety strategies and proven safety countermeasures.
- Expanded ability to consider human factors in all facets of design.
- Increased communication and collaboration among safety stakeholders.
- Objective review by independent multidisciplinary team.



Safety Benefits:

10-60%

reduction in total crashes.¹



Lighting



Safety Benefits:

**Lighting can reduce
crashes up to:**

42%

for nighttime injury pedestrian
crashes at intersections.¹

33-38%

for nighttime crashes at rural and
urban intersections.¹

28%

for nighttime injury crashes on
rural and urban highways.¹

Proven Safety Countermeasures Filter Tool

All 28 PSCs are listed at the bottom of the page in alphabetical order. Answer one or more of the following questions to obtain a tailored listing of potential PSCs for the location of interest. Users may select multiple answers for each question. After checking the desired box(es), click "Apply Filters," then the list of PSCs will update at the bottom of the page to match the query. Click "Clear Form" to remove all filters and return to the default display of all 28 PSCs. Select a countermeasure name to learn more including a description, safety effectiveness, context, application, cost, and considerations for implementation.

What type of area is the roadway located?

- Urban
- Suburban
- Rural

What is the functional classification of the roadway?

- Freeway
- Highway
- Arterial
- Collector
- Local

Which focus area is being addressed?

- Roadway Departure
- Intersection
- Pedestrian
- Bicyclist
- Speed Management

What is vehicular volume in Average Annual Daily Traffic (AADT) along the major roadway?

- Low (<2,000)
- Medium (2,000-15,000)
- High (>15,000)

Proven Safety Countermeasures Filter Tool

All 28 PSCs are listed at the bottom of the page in alphabetical order. Answer one or more of the following questions to obtain a tailored listing of potential PSCs for the location of interest. Users may select multiple answers for each question. After checking the desired box(es), click "Apply Filters," then the list of PSCs will update at the bottom of the page to match the query. Click "Clear Form" to remove all filters and return to the default display of all 28 PSCs. Select a countermeasure name to learn more including a description, safety effectiveness, context, application, cost, and considerations for implementation.

What type of area is the roadway located?

- Urban
- Suburban
- Rural

What is the functional classification of the roadway?

- Freeway
- Highway
- Arterial
- Collector
- Local

Which focus area is being addressed?

- Roadway Departure
- Intersection
- Pedestrian
- Bicyclist
- Speed Management

What is vehicular volume in Average Annual Daily Traffic (AADT) along the major roadway?

- Low (<2,000)
- Medium (2,000-15,000)
- High (>15,000)

10 results:



Crosswalk Visibility Enhancements



Leading Pedestrian Interval



Lighting



Local Road Safety Plans



Medians and Pedestrian Refuge Islands in Urban and Suburban Areas



Pedestrian Hybrid Beacons



Rectangular Rapid Flashing Beacons (RRFB)



Road Diets (Roadway Reconfiguration)



Road Safety Audit



Walkways

Prioritization of Countermeasures

- Prioritization can be qualitative or quantitative

Prioritizing Countermeasures Using Qualitative Rating

Overview

One method for prioritizing among several countermeasures is to qualitatively evaluate each potential countermeasure against a set of criteria important to the community. In addition to project cost, there are many other criteria that may influence the suitability of a countermeasure to a given site. Some of these are:

- Public demand for improvements;
- Available right of way;
- Environmental considerations;
- Potential positive or negative community response to the countermeasure;
- The presence of community endorsed plans for mobility or accessibility in the corridor;
- Road user needs;
- The community's transportation vision;
- Anticipated safety benefits;
- Design concerns; and
- Funding limitations.

Qualitative Prioritization

- Environmental Impacts.
- Anticipated Safety Benefits.
- Consistency with Community Plans.
- Public Acceptance.
- Right-of-Way Impacts.
- Construction Costs. (Can be quantified, or estimated at the order of magnitude level)
- Future Maintenance Costs. (Can be quantified, or estimated at the order of magnitude level)

Qualitative Prioritization

Table 7. Hypothetical Application of a “High,” “Medium,” and “Low” Rating
Site A Countermeasure 1 Site A Countermeasure 2

Environmental Impacts	Low	Medium
Anticipated Safety Benefits	Medium	High
Consistency with Community Plans	High	High
Public Acceptance	Medium	Low
Right-of-Way Impacts	Low	High
Order of Magnitude Costs	Low	High
Future Maintenance Obligations	Medium	Medium
Countermeasure Selected?	Yes	No

Prioritizing Countermeasures Based on Economic Evaluation

- Countermeasures can be evaluated by converting the benefits and costs of the countermeasure to monetary value and conducting either a benefit/cost analysis, or a cost effectiveness analysis.
- In a benefit/cost analysis, safety benefits are converted to the estimated dollar value of fatalities, injuries, and property damage avoided over the service life of the treatment. This is calculated as the net present dollar value of benefits. The dollar value of these benefits is then compared to the dollar value of constructing and maintaining the countermeasure over the service life of the countermeasure. Costs include construction costs, environmental costs, planning and design costs, and ongoing maintenance costs. Consideration also is given to service life of the countermeasure. In more complex applications of benefit/cost analysis, societal costs (including health care costs, pain and suffering, and insurance costs) and benefits also are considered and quantified.
- Cost effectiveness analysis is similar to benefit/cost analysis except that instead of quantifying safety benefits in terms of dollar values, safety benefits are quantified in terms of expected crash reductions. Cost effectiveness analysis is used when it is not possible or practical to estimate the dollar value of the safety benefits of a treatment.

Net Present Value

- The net present value (NPV) or net present worth (NPW) benefit/cost analysis method expresses the difference between the discounted costs and discounted benefits of a safety improvement project. The costs and benefits have been “discounted” meaning they have been converted to a present value using a discount rate.

The $NPV = PVB - PVC$

Where $PVB =$ Present value of benefits, and

$PVC =$ Present value of costs

Net Present Value

$$\text{NPV} = \frac{R_t}{(1 + i)^t}$$

NPV = net present value

R_t = net cash flow at time t

i = discount rate

t = time of the cash flow

Benefit/Cost Ratio

- Economic cost of road fatalities, injuries, and property damage must be estimated
- A benefit/cost ratio divides the sum of all of the benefits associated with implementing a countermeasure, expressed in monetary terms, by the sum of all the costs associated with implementing and maintaining the countermeasure. The benefit/cost ratio (B/C Ratio) of the project is the ratio of the present dollar value of the benefits to the present dollar value of the costs.

$$\text{B/C Ratio} = \text{PVB/PVC}$$

Where:

PVB = Present value of benefits, the dollar value of injuries reduced; and

PVC = Present value of costs, the dollar value of costs to implement the countermeasure.

Cost-effectiveness index

$$\text{Cost-Effective Index} = \text{PVC}/\text{AR}$$

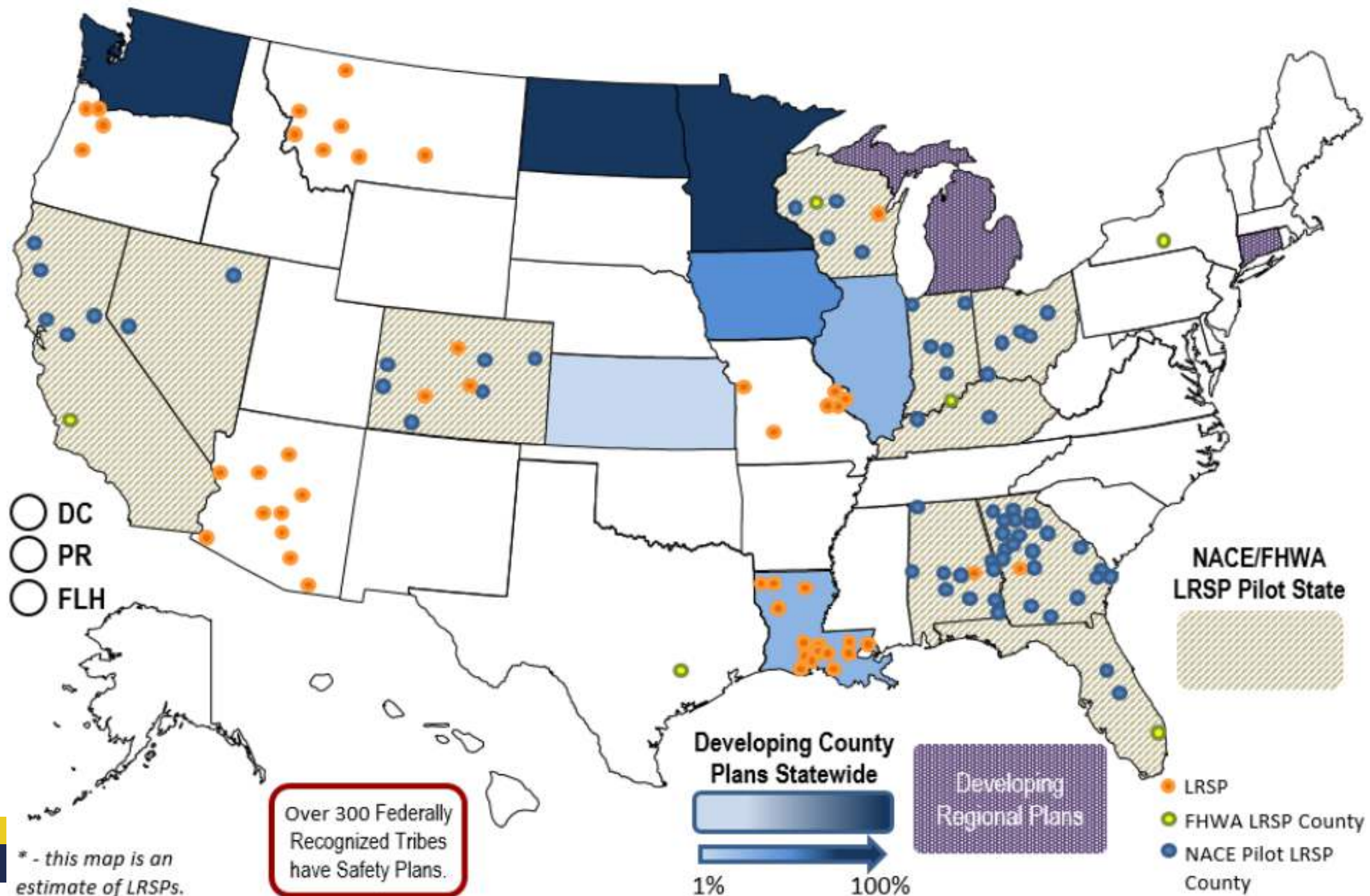
Where:

PVC = Present value of project cost; and

AR = Total crash reduction.

Table 17. Prioritized Engineering Countermeasures for High-injury Corridors

EPDO Rank	Primary Road (Begin – End Segment)	Recommended Countermeasures	Time Range (Years)	Preliminary B/C Ratio	Total Expected Benefit	Preliminary Estimated Project Cost
1	Lone Hill Ave (Route 66 – Gladstone St)	R27: Install delineators, reflectors and/or object markers		305.9	\$4,588,779	\$15,000
		R22: Upgrade signing and striping [SI]	5-10	30.6	\$4,588,779	\$150,000
		R35PB: Install/upgrade pedestrian crossing (with enhanced safety features)	<5	131.4	\$3,285,919	\$25,000
		R21: Improve pavement friction (High Friction Surface Treatments)	5-10	121.3	\$18,189,753	\$150,000
		R32PB: Enhance Bike Facilities	5-10	12.3	\$2,766,085	\$225,000
2	Gladstone St (Sunflower Ave – Lone Hill Ave)	R22: Upgrade signing and striping [SI]	5-10	28.9	\$4,338,893	\$150,000
		R32PB: Enhance Bike Facilities	5-10	0.1	\$19,285	\$225,000
3	Grand Ave (Baseline Rd – Arrow Hwy)	R22: Upgrade signing and striping [SI]	5-10	24.0	\$3,594,015	\$150,000
		R32PB: Enhance Bike Facilities	<5	127.4	\$3,184,811	\$25,000
4	Sunflower Ave (Gladstone St – Arrow Hwy)	R22: Upgrade signing and striping [SI]	<5	42.5	\$3,184,811	\$75,000
5	Route 66 (Glendora Ave – Loraine Ave)	R27: Install delineators, reflectors and/or object markers	<5	191.4	\$2,871,662	\$15,000
		R22: Upgrade signing and striping [SI]	5-10	19.1	\$2,871,662	\$150,000
		R32PB: Install Bike Facilities	5-10	1.7	\$385,388	\$225,000
6	Gladstone St (Barranca Ave – Grand Ave)	R22: Upgrade signing and striping [SI]	<5	40.9	\$3,066,090	\$75,000
		R01: Add segment lighting	<5	142.8	\$10,710,257	\$75,000
		R32PB: Install Bike Facilities	<5	27.7	\$3,185,250	\$115,000
7	Barranca Ave (Baseline Rd – Gladstone St)	R22: Upgrade signing and striping [SI]	<5	39.3	\$2,946,216	\$75,000
		R01: Add segment lighting	<5	141.4	\$10,601,666	\$75,000
		R32PB: Install Bike Facilities	<5	27.7	\$3,185,250	\$115,000
8	Route 66 (Loraine Ave – Amelia Ave)	R27: Install delineators, reflectors and/or object markers	<5	90.3	\$2,256,435	\$25,000
		R22: Upgrade signing and striping [SI]	5-10	10.0	\$2,256,435	\$225,000
		R32PB: Install bike facilities	10+	1.2	\$404,420	\$350,000
		R21: Improve pavement friction (High Friction Surface Treatments)	5-10	36.8	\$8,273,595	\$225,000



* - this map is an estimate of LRSPs.

Safe Streets For All (SS4A)

- Bipartisan Infrastructure Law announced \$5 billion in funds over the next 5 years
- Deadline for FY22 funding cycle is Sept. 15
- NOFO for next round expected in May 2023
- Requires “Action Plan” → LRSP can meet this requirement

SS4A Action Plan Components

Leadership Commitment and Goal Setting

- Vision Zero commitment with target date

Planning structure

- A committee, task force, implementation group, or similar body charged with oversight of the Action Plan development, implementation, and monitoring.

Safety Analysis

- Locations
- Severity
- Contributing factors
- Crash types
- Road users
- Systemic and specific safety needs
- All roadways in jurisdiction
- Identify higher-risk locations

SS4A Action Plan Components

Engagement and Collaboration

- Robust engagement with the public and relevant stakeholders, including the private sector and community groups
- Information received from engagement and collaboration is analyzed and incorporated into the Action Plan.
- Overlapping jurisdictions are included in the process.
- Plans and processes are coordinated and aligned with other governmental plans and planning processes to the extent practical.

SS4A Action Plan Components

Equity Considerations

- Underserved communities are identified through data and other analyses in collaboration with appropriate partners.
- Analysis includes both population characteristics and initial equity impact assessments of the proposed projects and strategies.

Policy and Process Changes

- Assessment of current policies, plans, guidelines, and/or standards (e.g., manuals) to identify opportunities to improve how processes prioritize transportation safety.
- The Action Plan discusses implementation through the adoption of revised or new policies, guidelines, and/or standards, as appropriate.

SS4A Action Plan Components

Strategy and Project Selections

- Identification of a comprehensive set of projects and strategies, shaped by data, the best available evidence and noteworthy practices, as well as stakeholder input and equity considerations, that will address the safety problems described in the Action Plan.
- These strategies and countermeasures focus on a Safe System Approach, effective interventions, and consider multidisciplinary activities.
- Once identified, the list of projects and strategies is prioritized in a list that provides time ranges for when the strategies and countermeasures will be deployed

Progress and Transparency

- Method to measure progress over time
- Must include, at a minimum, annual public and accessible reporting on progress toward reducing roadway fatalities and serious injuries, and public posting of the Action Plan online.

Other Funding Opportunities

Improving Neighborhood Outcomes in Disproportionally Impacted Communities

(Georgia Governor's Office of Planning and Budget)

- Investments in neighborhood features, including parks, recreation facilities, sidewalks, and healthy food access within Qualified Census Tracts
- Apply by 11/18/2022

GDOT – LMIG, TIA, etc.

MPO funding

Questions?