INTEGRATING INTERACTIVE VISUALIZATION TOOLS INTO SAFETY PLANNING

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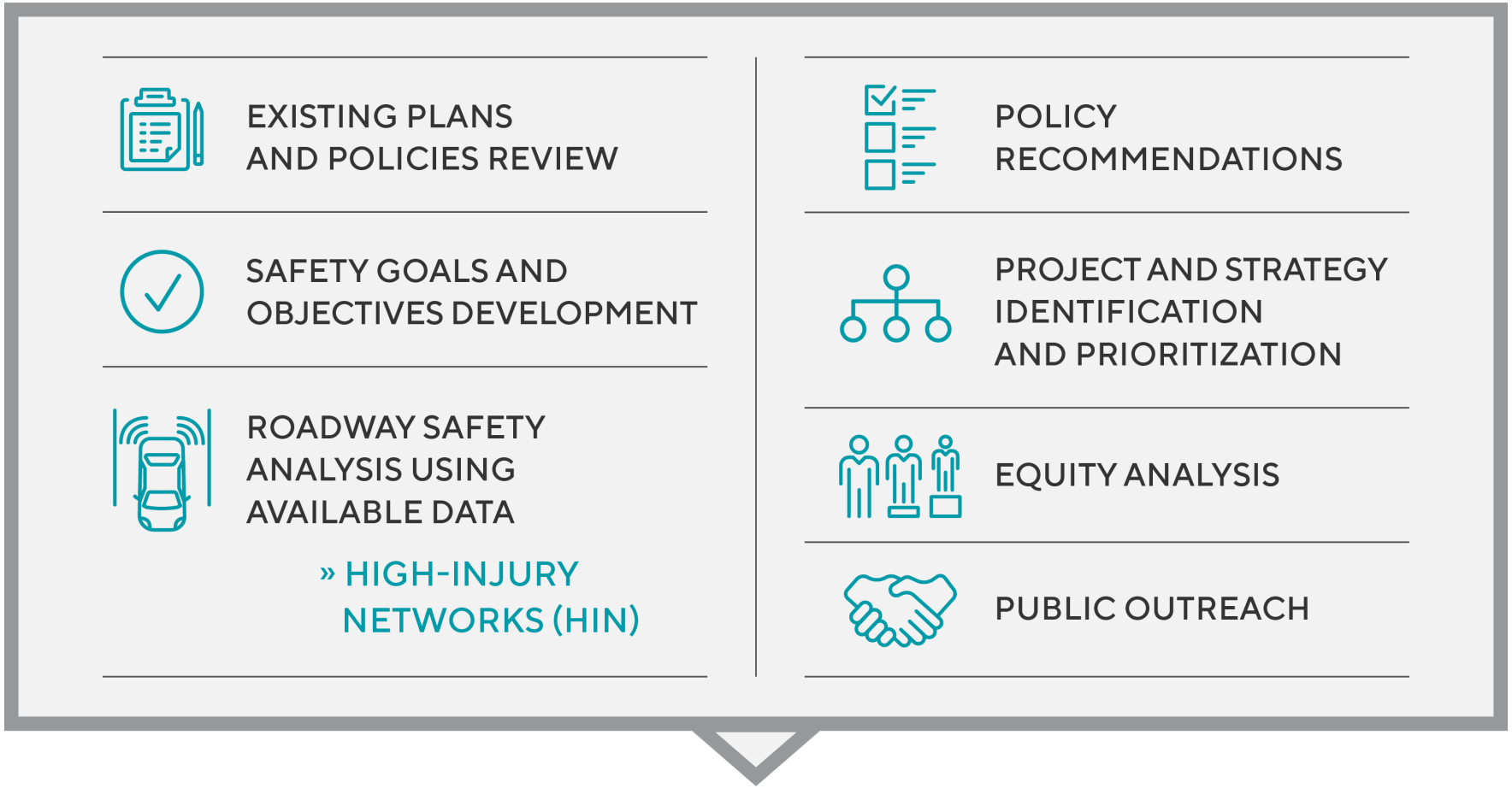
REGIONAL SAFETY ACTION PLAN (RSAP)

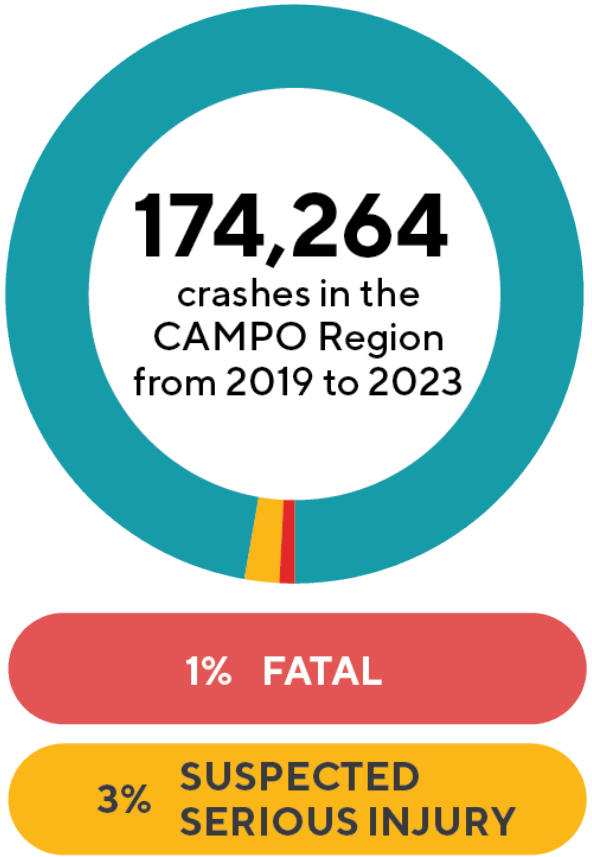
- CAMPO received funding from USDOT to conduct a roadway safety plan through the Safe Streets and Roads for All (SS4A) grant program.
- The plan includes a CAMPO-wide regional plan and individual chapters for each member county.
- This plan will allow CAMPO and local jurisdictions to apply for implementation funding through SS4A.

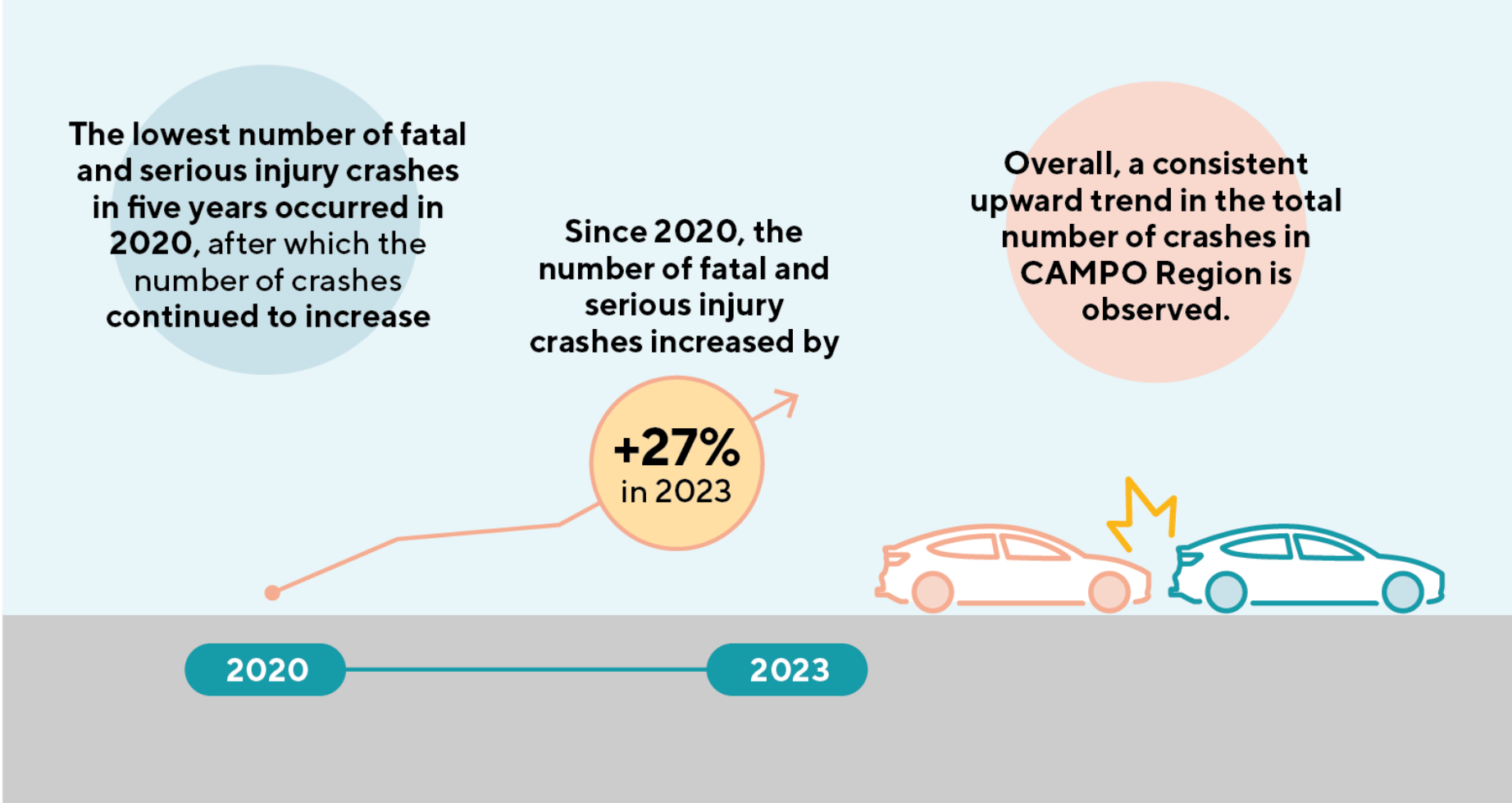
PROJECT SCOPE



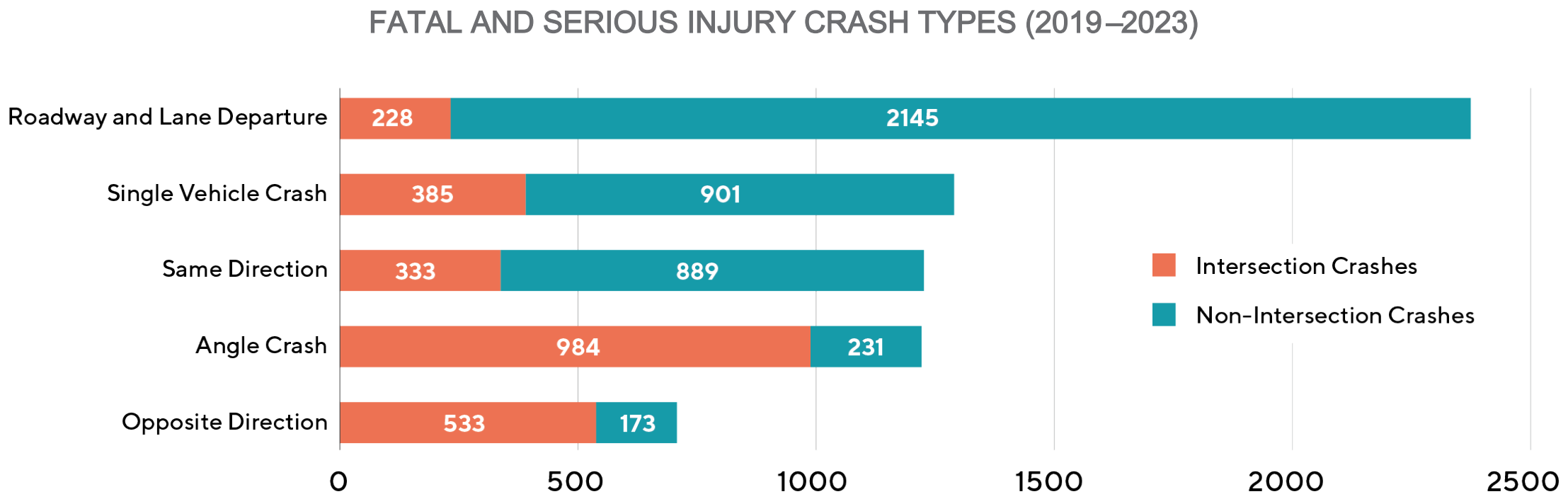
REGIONAL SAFETY ACTION PLAN WITH COUNTY CHAPTERS

CAMPO REGION: HISTORIC CRASH ANALYSIS





CAMPO REGION: HISTORIC CRASH ANALYSIS



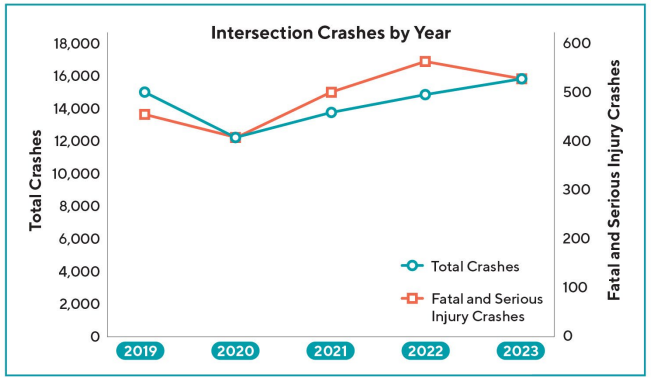
Notes :

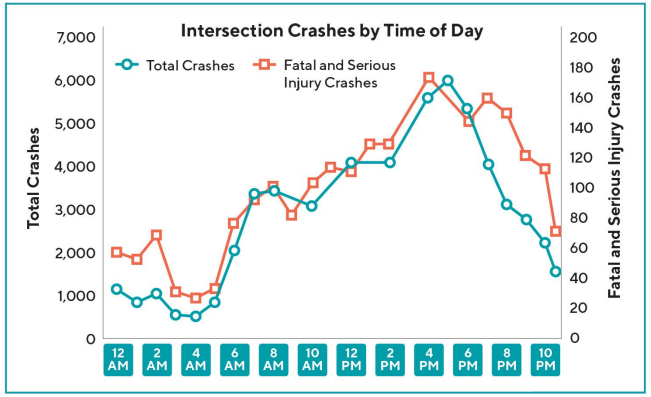
- Crash types are mutually exclusive, meaning each crash is counted only once.
- A 'Roadway and Lane Departure' crash occurs when a single vehicle's first harmful event happens off the roadway or when two vehicles collide head-on due to one traveling the wrong way without attempting to pass.
- 'Single Vehicle' and 'Opposite Direction' crash types are counted only if they do not meet the Roadway and Lane Departure criteria.
- Intersection crashes include those where the crash data is labeled as 'At Intersection' or 'Intersection Related'. Non-intersection crashes include 'Driveway Related' or ' Non Intersection'.

	DARK CONDITIONS	INTERSECTION	ROADWAY DEPARTURE	YOUNGER AND OLDER DRIVERS	SPEED RELATED
Total Crashes	34%	41%	21%	32%	22%
Fatal and Serious Injury Crashes	47%	36%	35%	29%	25%

	IMPAIRED DRIVING	OCCUPANT PROTECTION	VULNERABLE ROAD USERS	MOTORCYCLE	DISTRACTED DRIVING
Total Crashes	6%	3%	3%	2%	19%
Fatal and Serious Injury Crashes	17%	15%	15%	15%	13%

Intersection Related
2019-2023 CRASH DATA INSIGHTS





Total Crashes
71,920 | 41%

Fatal and Serious Injury Crashes (KA)
2,470 | 36%

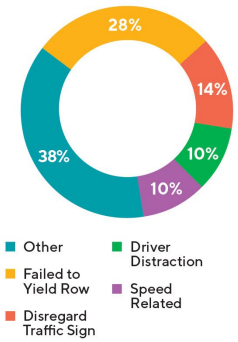
Trend ↑

Peak Crashes
Evening

Crash Types (KA)

- Same Direction 13%
- Single Vehicle Crash 16%
- Roadway and Lane Departure 9%
- Opposite Direction 22%
- Angle Crash 40%

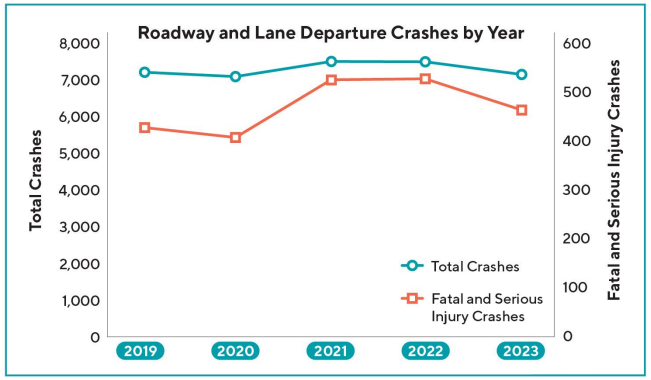
Top Contributing Factors (%KA)

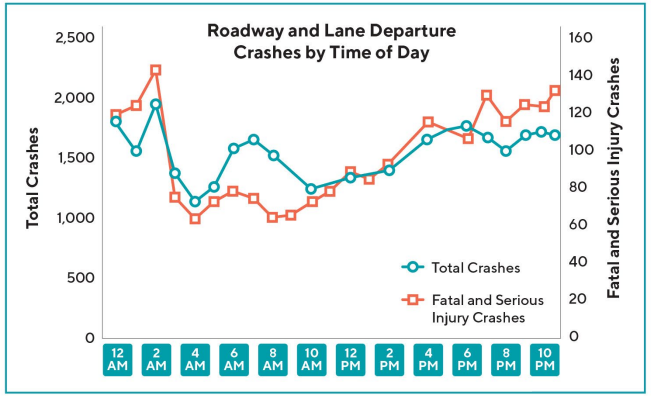


Intersection Related

- 40% Dark Conditions
- 19% Younger Drivers
- 16% Older Drivers
- 15% Speed Related

Roadway and Lane Departures
2019-2023 CRASH DATA INSIGHTS





Total Crashes
36,771 | 21%

Fatal and Serious Injury Crashes (KA)
2,373 | 35%

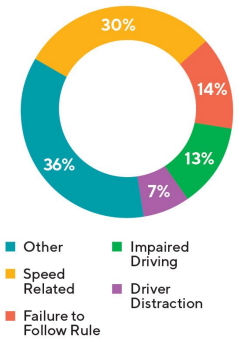
Trend ↑

Peak Crashes
Early Morning

Crash Types (KA)

- Roadway and Lane Departures 100%

Top Contributing Factors (%KA)



Roadway and Lane Departure Crashes

- 54% Dark Conditions
- 38% Speed Related
- 26% Impaired Driving
- 24% Occupant Protection

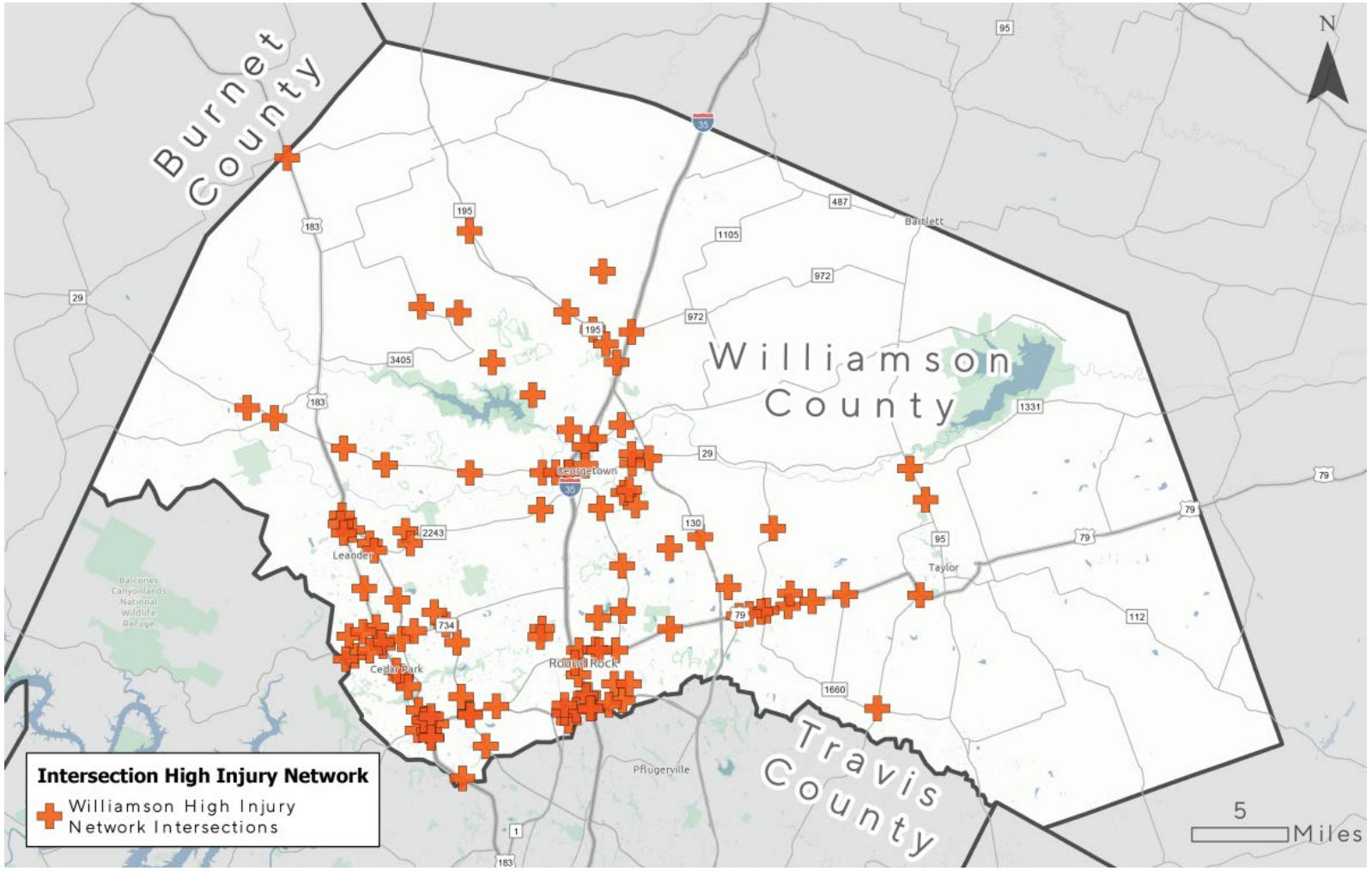
WILLIAMSON COUNTY:
HIN – INTERSECTION METHODOLOGY

1. **Obtain Williamson County 2019 – 2023 crash data**
2. **Conduct spatial analysis in GIS**
    1. Inventory and identify the roadway network
    2. Identify intersections and capture them
    3. Geolocate intersection information
    4. Summarize crashes by severity type for each intersection
3. **Weigh crashes based on severity type:**
    - > Fatal (K) and suspected serious injury (A) crashes = 12 points
    - > Suspected minor injury (B) and possible injury crashes (C) = 1 point
    - > Non-injured or unknown crash types = 0 points

Intersections with high severity type crashes will have high weighted points.

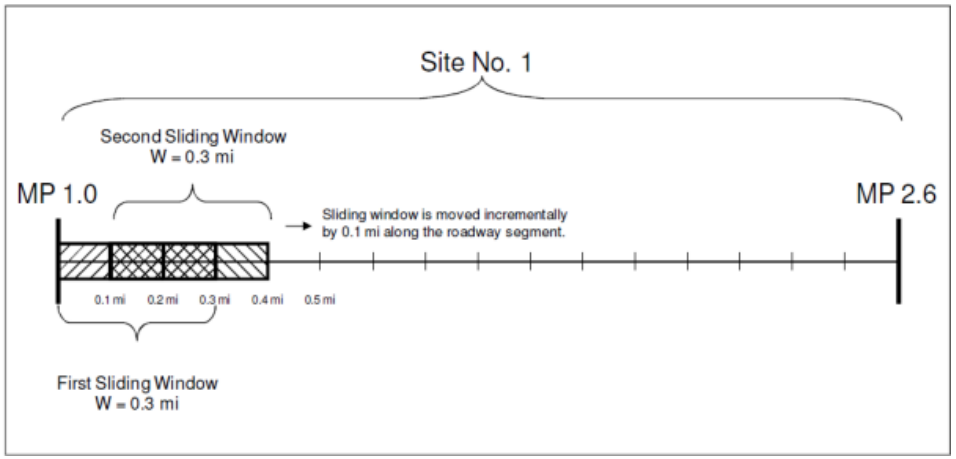
WILLIAMSON COUNTY:
HIN – INTERSECTION METHODOLOGY

Over half of all fatal intersection crashes in Williamson County occurred on **only 7%** of the county's intersections



WILLIAMSON COUNTY:
HIN – NON-INTERSECTION METHODOLOGY

Illustration of a Sliding Window Method

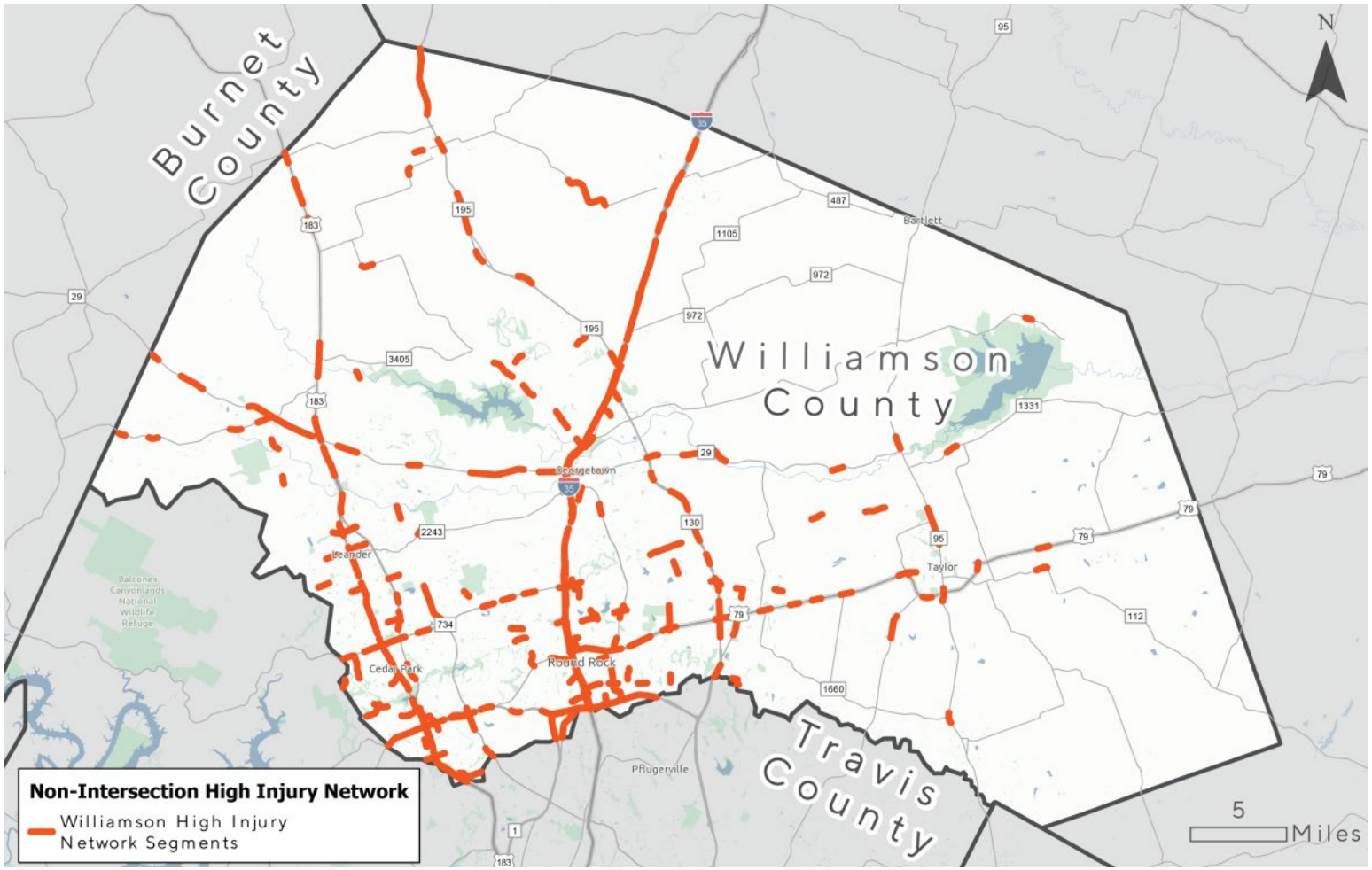


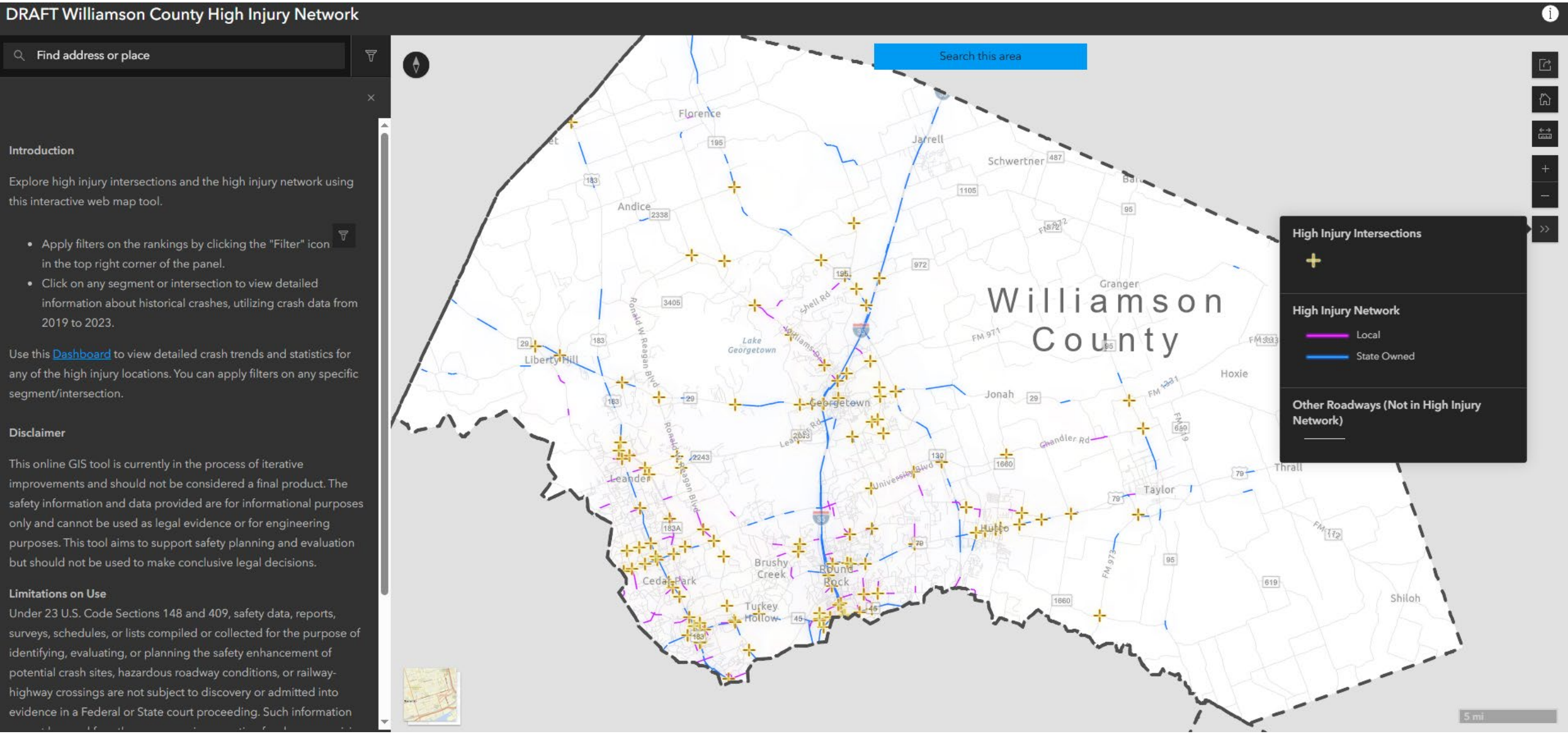
1. **Split each corridor** into 0.1-mile-long segments
2. **Join crashes** to the 0.1-mile segment layer using street name
3. **Spatially join any remaining crashes** using a search distance of up to 200 feet
4. **Summarize the 0.1-mile segment layer**'s unique ID and crash statistics and emphasis area (Python Script)
5. **Identify a cutoff** for identifying High Injury Network (based on weighted crash score).
6. **Merge contiguous segments** within the High Injury Network and rank them using the weight crash score.

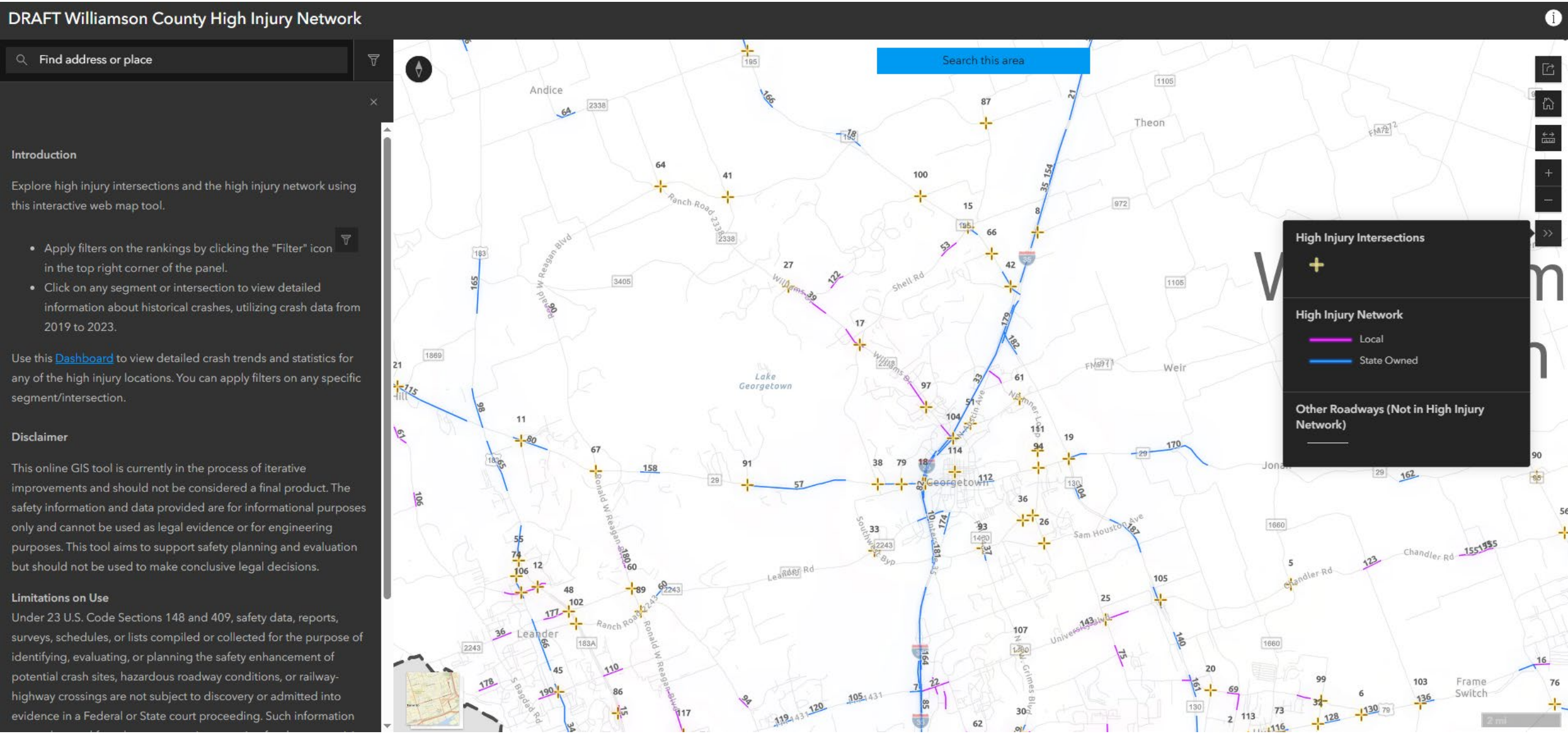
A sliding 0.5-mile window with a 0.1-mile increment was used

WILLIAMSON COUNTY:
HIGH-INJURY SEGMENTS

Over **70% of all fatal and serious injury** non-intersection crashes in Williamson County occurred on only **8% of the county's roadways**.




DRAFT Williamson County High Injury Network
Find address or place
Introduction
Explore high injury intersections and the high injury network using this interactive web map tool.
Apply filters on the rankings by clicking the "Filter" icon in the top right corner of the panel.
Click on any segment or intersection to view detailed information about historical crashes, utilizing crash data from 2019 to 2023.
Use this Dashboard to view detailed crash trends and statistics for any of the high injury locations. You can apply filters on any specific segment/intersection.
Disclaimer
This online GIS tool is currently in the process of iterative improvements and should not be considered a final product. The safety information and data provided are for informational purposes only and cannot be used as legal evidence or for engineering purposes. This tool aims to support safety planning and evaluation but should not be used to make conclusive legal decisions.
Limitations on Use
Under 23 U.S. Code Sections 148 and 409, safety data, reports, surveys, schedules, or lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding. Such information
Search this area
Williamson County
Florence
Jarrell
Schwertner
Andice
Granger
Liberty Hill
Georgetown
Lake Georgetown
Jonah
Hoxie
Leander
Cedar Park
Brushy Creek
Round Rock
Taylor
Thrall
Turkey Hollow
Shiloh
High Injury Intersections
High Injury Network
Local
State Owned
Other Roadways (Not in High Injury Network)
5 mi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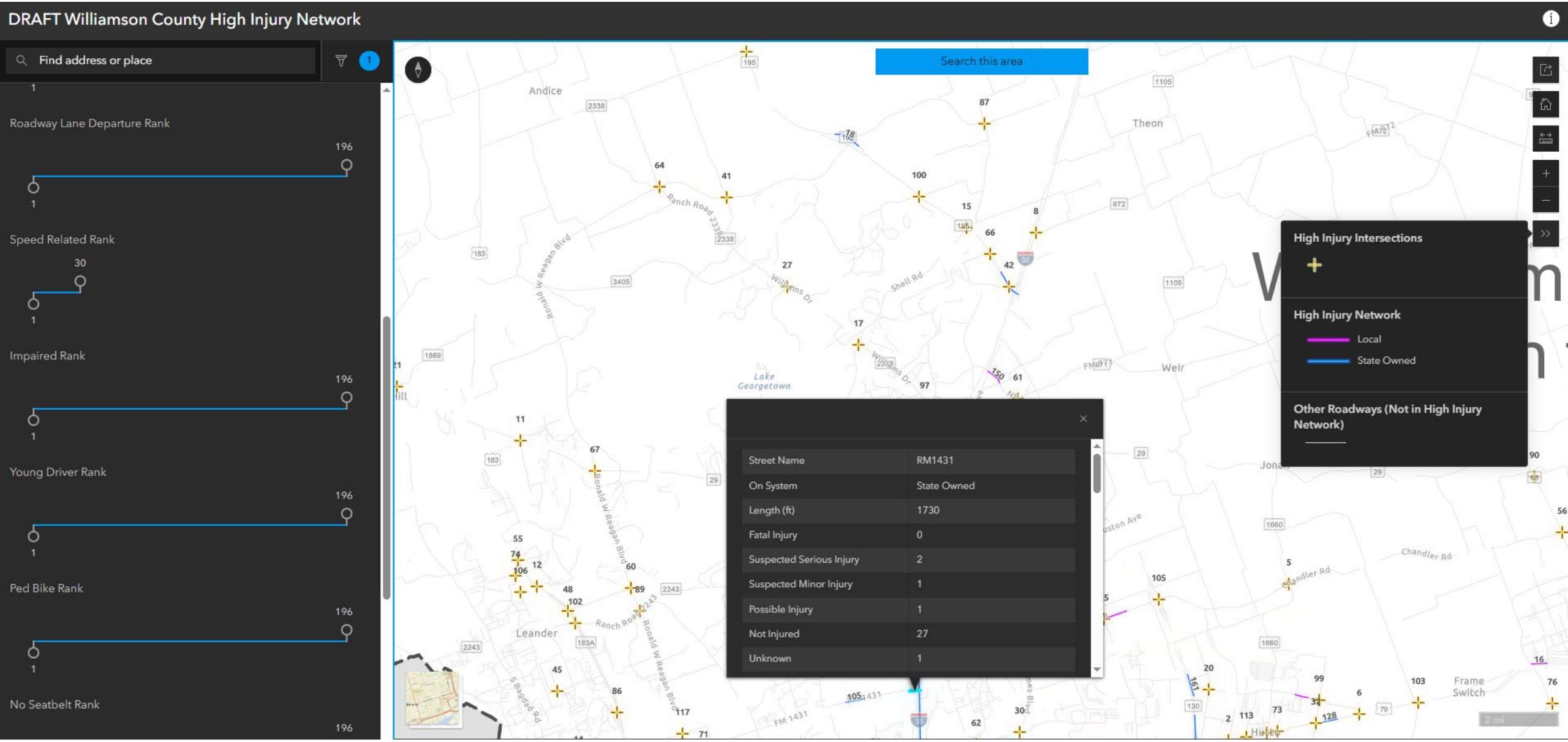
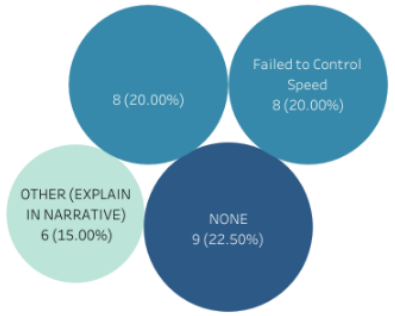
Search this area
High Injury Intersections
High Injury Network
Local
State Owned
Other Roadways (Not in High Injury Network)
Andice
Theon
Weir
Lake Georgetown
Georgetown
Leander
Frame Switch
Ranch Road 2338
W Reagan Blvd
Shell Rd
Williams Dr
Ronald W Reagan Blvd
Sam Houston Ave
Chandler Rd
Lear Rd
S Bagdad Rd
N Grimes Blvd
2 mi


DRAFT Williamson County High Injury Network
Find address or place
Roadway Lane Departure Rank
196
1
Speed Related Rank
30
1
Impaired Rank
196
1
Young Driver Rank
196
1
Ped Bike Rank
196
1
No Seatbelt Rank
196
Search this area
Andice
Theon
Weir
Leander
Lake Georgetown
Ranch Road 2338
Ronald W Reagan Blvd
Williams Dr
Shell Rd
Chandler Rd
Frame Switch
FM 1431
Street Name RM1431
On System State Owned
Length (ft) 1730
Fatal Injury 0
Suspected Serious Injury 2
Suspected Minor Injury 1
Possible Injury 1
Not Injured 27
Unknown 1
High Injury Intersections
High Injury Network
Local
State Owned
Other Roadways (Not in High Injury Network)

Crash Collision Type

Crash Type	Collision Type	Direction	Fatal Injury	Suspected Major Injury	Suspected Minor Injury	Possible Injury
Angle C..	Angle - on..	North-East				1
Roadway and Lane Departure	One motor vehicle - going straight	East	1		1	4
		East-East				1
		Northeast			1	4
		Northeast-Northe..	1		1	
		Northwest				1
		Southwest			1	1
		West		1	3	3
		West-West		1	3	
Same Direction	Same direction - both going..	East-East			1	
		East-Not applicable				1
		Northeast-Northe..			2	1
	Same dire..	West-West				3
	Same dire..	East-East				1
Single Vehicle..	One motor vehicle - g..	East			1	
		East-Not applicable	1			

Contributing Factors



First Harmful Event

Harmful Event	Fatal Injury	Suspected Major Injury	Suspected Minor Injury	Possible Injury
Fixed Object	2	2	9	14
Motor Vehicle In Tr..			3	7
Overturned			2	
Pedestrian	1			

Heat Map

Segment Rank: 5

Intersection Rank: (All)

% Contributing Factors: 0.1500 – 1.0000

On-System: (All)

Crash Severity: (All)

Crash Type: (All)

Location: (All)

Harmful Event: (All)

Light Condition: (All)

Contributing Factor: (All)

Map

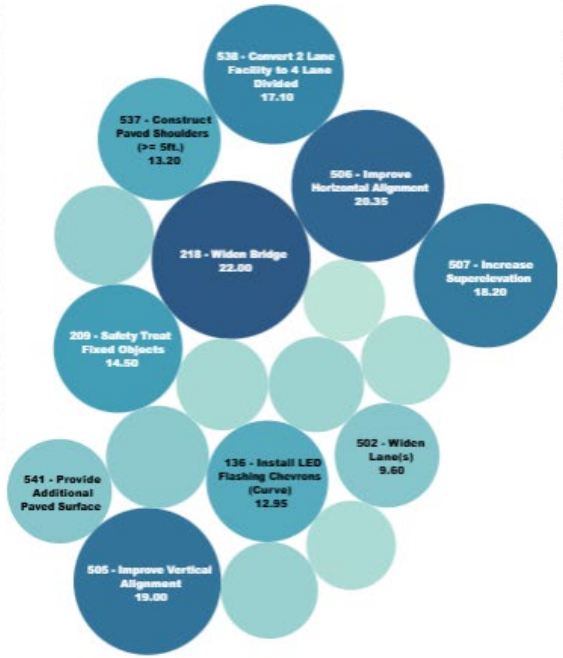
Crash Severity
- Fatal Injury
- Suspected Major Injury
- Suspected Minor Injury
- Possible Injury

Crash Type
- Angle Crash
- Roadway and Lane Departure
- Same Direction
- Single Vehicle Crash

Crash Types by Severity

Crash Type	Fatal Injury	Suspected Major Injury	Suspected Minor Injury	Possible Injury
Angle Crash				1
Roadway and Lane D..	2	2	10	14
Same Direction			3	6
Single Vehicle Cra..	1		1	

Top Work Codes (Expected Crashes Reduced)



On-System: (All)

Segment Rank: 5

Intersection Rank: (All)

Crashes Reduced: 0 – 7,000

Crashes Reduced: 2.0% – 10.0%

Crash Type: (All)

Harmful Event: (All)

Object Struck: (All)

Contributing Factor: (All)

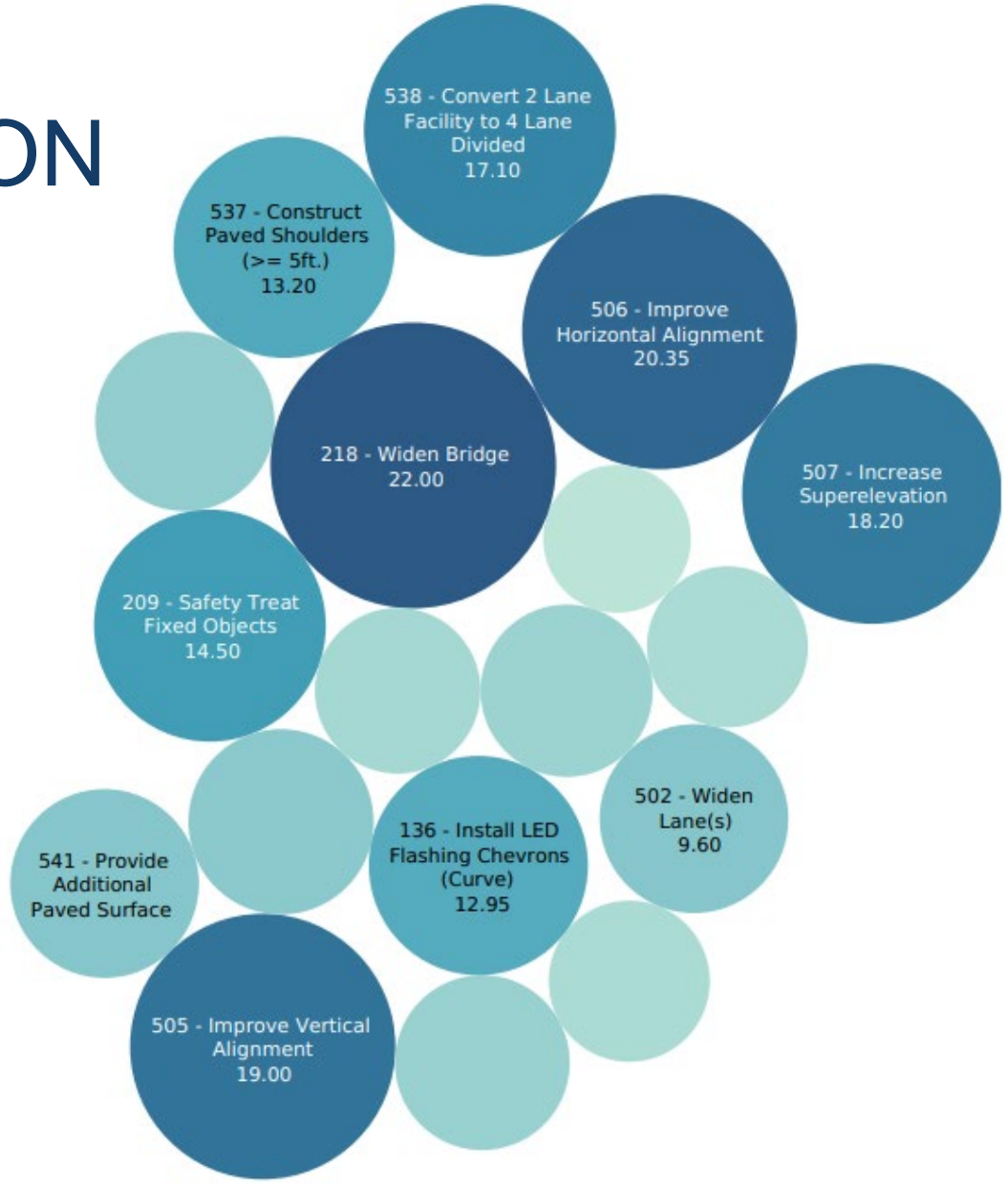
Countermeasure: (All)

HSIP COUNTERMEASURES EXPECTED CRASH REDUCTION

HSIP Countermeasure Overview

- Crash reduction estimates based on TxDOT-approved formulas
- Each work code linked to specific crash types and conditions
- Used to review High Injury Network segments for treatment options
- Includes 5-year projected crash reductions (e.g., 14.5 for safety treat fixed objects)
- Enables engineers and planners to assess and select appropriate countermeasures
- Aligned with Safe System and Vision Zero principles

209 Safety Treat Fixed Objects			
Definition:	Remove, relocate, or safety treat all fixed objects including the installation of guardrail for safety treatment of a fixed object or drainage structures within the project limits, to include both point and continuous objects.		
Reduction Factor (%):	50%	Maintenance Cost:	$0
Service Life (Years):	20	G-Match:	C
Preventable Crash:	(Roadway Related = 2, 3 or 4) OR (Object Struck = 20-26, 29-36, 40-42, 56-58, 60, 62, or 63)		
Required Documents:	None		

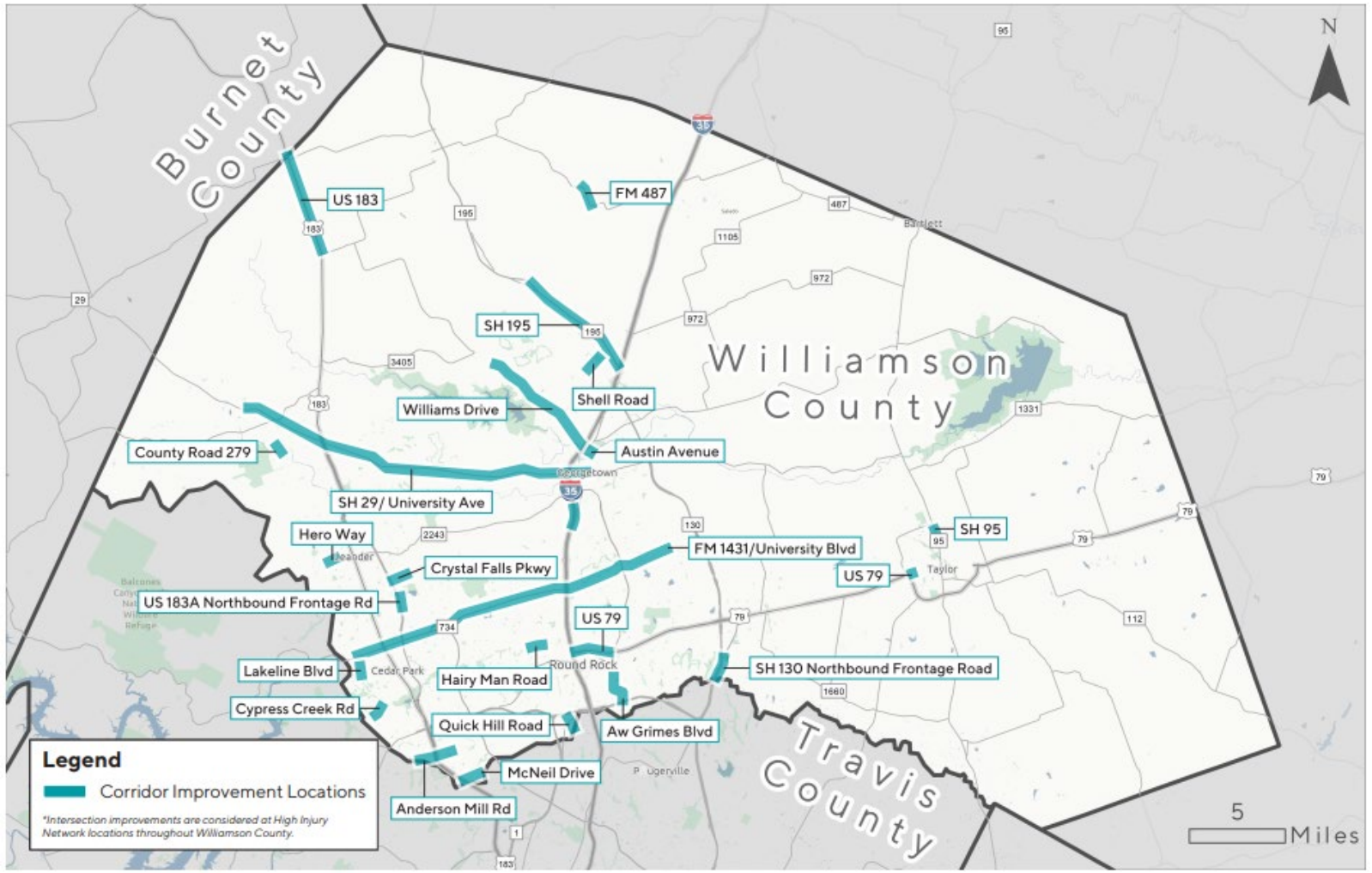


PROJECT DEVELOPMENT
TARGETED PROJECTS MAP (EXAMPLE)

Proposed Safety-Driven Infrastructure Improvements:

23
Corridor Improvements

36
Intersection Improvements



PROJECT DEVELOPMENT
TARGETED PROJECTS EXAMPLE

Roadway Name	Limits From	Limits to	Project Description	Ownership	Safety Issues
Shell Road	Shell Spur	SH 195	Add edge line and center line rumble strips. Widen paved shoulder.	Williamson County	Roadway and Lane Departure
Crystal Falls Parkway	US 183A	Ridgmar Road	Close cross-overs where possible and align left-turns for a positive offset where possible. Add roadway lighting	Leander	Angle Crashes
US 79	Carlos G Parker Boulevard	Sloan Street	Add raised median with hooded lefts	Taylor	Angle Crashes
Williams Drive	Jim Hogg Road	Austin Avenue	Add raised median with strategically placed hooded lefts, add raised profile striping, add raised profile markers, safety treat fixed objects, add roadway lighting.	Georgetown	Angle Crashes Roadway and Lane Departure Dark Conditions
SH 195	Ronald Reagan Boulevard	IH 35	Add rumble strips and roadway lighting. Install wrong-way detection system. Replace "signal ahead" warning sign with roadside flashing beacon with "signal ahead" warning sign.	TxDOT	Roadway and Lane Departure Dark Conditions
Cypress Creek Road	Sun Chase Boulevard	Lakeline Boulevard	Add edgeline delineators, evaluate speed limit using USLIMITS2	Cedar Park	Speed Management Roadway and Lane Departure

SUMMARY
KEY TAKEAWAYS

Why This Matters Beyond CAMPO?

- Replicable framework for other MPOs and local agencies developing SS4A action plans
- Integrates crash data, GIS, and TxDOT HSIP formulas into one streamlined, visual analysis
- Improves transparency in how safety projects are selected and prioritized
- Supports grant readiness by aligning analysis with HSIP and SS4A funding criteria
- Facilitates collaboration between regional planners, local engineers, and TxDOT

QUESTIONS?

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