

Safety Analysis Noteworthy Practice:

Forecast Risks Using Historical Data and Analysis



Use historical crash data to shift from identifying where harm has occurred to proactively identifying where it can be prevented next.

Noteworthy Practices for Forecasting Crash Risk:

- Use historical crash data to identify patterns, trends, and conditions associated with severe and fatal crashes
- Develop high-injury and high-risk networks to pinpoint locations where future harm is most likely to occur
- Analyze crash characteristics and profiles to better understand the factors contributing to severe outcomes
- Present safety information in multiple formats to support understanding across audiences

The following success stories highlight how SS4A grant recipients have applied these practices in their grants.

Using Data and Input to Identify a High-Injury and High-Risk Network



City of Thornton

Colorado, Urban, FY22

[View Thornton's Action Plan to learn more](#)

Thornton conducted a **proactive systemic safety analysis** using citizen input combined with **contextual factors** and **historical crash data** to pinpoint the City's combined High-Injury and High-Risk Network. This approach uses historical patterns to guide crash mitigation and prevention efforts. Thornton:



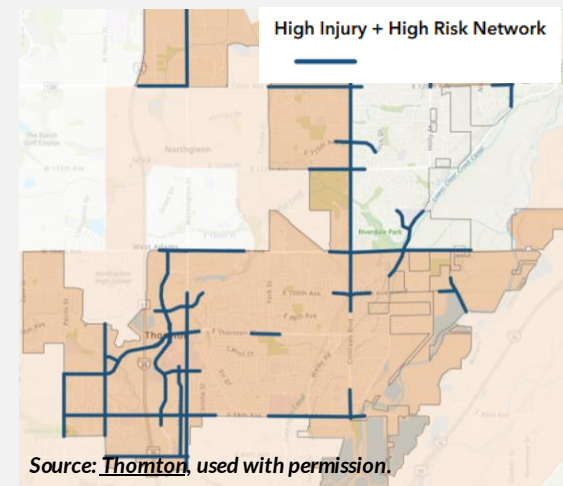
Conducted an analysis of historical crash data, examining crash types, contributing factors, and locations with the highest number of fatal and serious injury crashes.



Created a publicly available GIS dashboard illustrating crash data maps, high-injury networks, and high-risk networks.



Identified nine of the most common crash profiles by percentage that result in the deadliest and most severe crashes to help select appropriate safety countermeasures.



Source: [Thornton](#), used with permission.

Thornton developed a publicly accessible interactive map that includes the high-injury and high-risk network.

“ The High-Injury Network and High-Risk Network covers only 6% of the city's streets but accounts for 64% of the crashes in Thornton that caused a death or serious injury. ”

Identifying Conditions Leading to Severe Crashes



Roanoke County
Virginia, Urban, FY22

[View Roanoke County's Action Plan to learn more](#)

Roanoke County analyzed historical crash data to identify the types, locations, and circumstances of all non-interstate crashes and documented its findings through a public dashboard and story map. Roanoke County:



Mapped crash data to identify the most common crash types resulting in fatal or serious injuries.

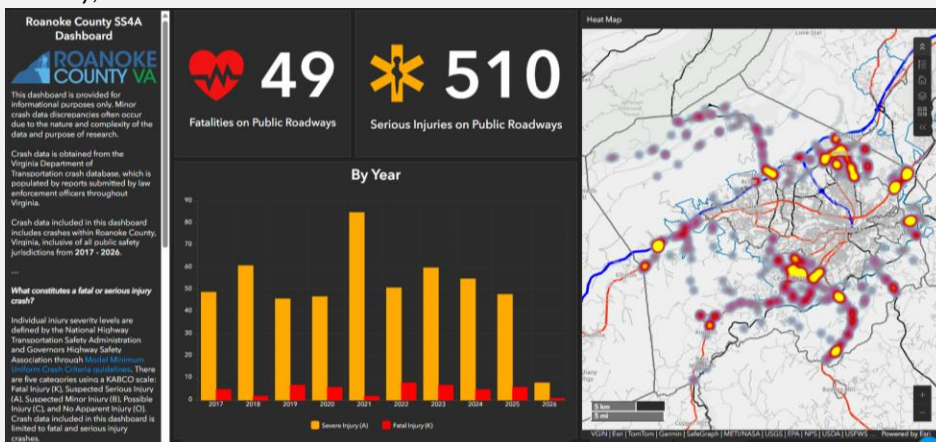


Examined circumstances associated with fatal or serious injuries, including weather and environmental conditions, driver behavior, driver age, severity by mode of transportation, and crashes involving vulnerable road users.



Identified high-injury networks using crash density, crash rates, and crash rate ratios, with results shared through a public dashboard and story map.

Roanoke County's dashboard, which includes maps of crash data which can be filtered by road type, weather conditions, road conditions, collision type, crash severity, and date.



Source: [Roanoke County](#), used with permission.

Using Analysis to Identify Severe Crash Profiles



Fargo Moorhead Metropolitan Council of Governments (Metro COG)

North Dakota, Rural, FY22

[View Metro COG's to learn more](#)

Metro COG studied the conditions and locations associated with crash types over a four-year period and developed a public dashboard to display trends. Metro COG:



Identified trends, conditions, and roadway types associated with serious and fatal injuries to inform the development of targeted countermeasures.



Pinpointed three dominant crash profiles by identifying the most prevalent factors contributing to severe crashes, informing recommendations for roadway improvements.



Developed a public dashboard documenting high-injury networks and severe crashes by mode of transportation.



“ Systematic analysis allows Metro COG and partners to proactively work to minimize the occurrence and severity of crashes into the future. ”

Metro COG's high-injury network (HIN) consists of roads with the highest severe crash concentrations over the most recent five-year period.

Source: [Metro COG](#), used with permission.