



Using Data to Support Your Safe System Approach

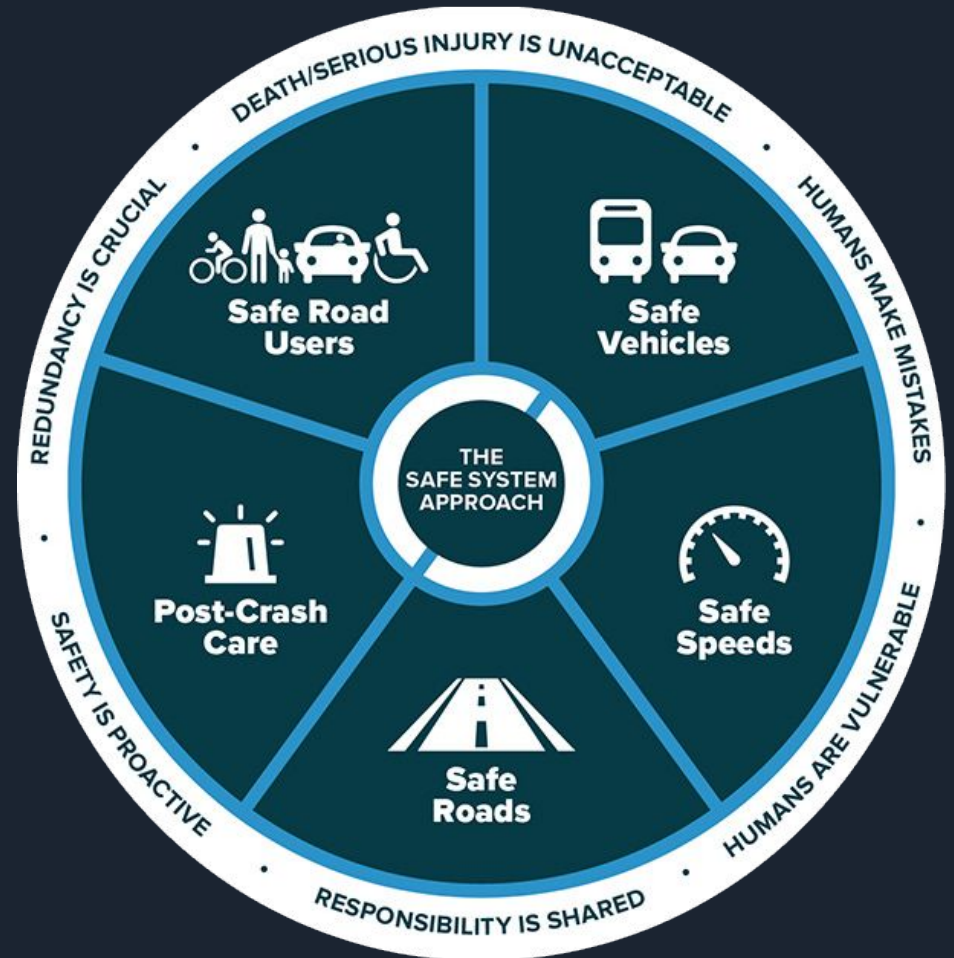
“We cannot tolerate the **continuing crisis of roadway deaths** in America. These deaths are preventable ... because every driver, passenger, and pedestrian should be certain that they're going to arrive at their destination safely, every time.”

- Pete Buttigieg

United States Secretary of Transportation

Foundational Principles of the Safe System Approach

The Safe System Approach considers five elements of a safe transportation system—safe road users, safe vehicles, safe speeds, safe roads, and post-crash care—in an integrated and holistic manner. Achieving zero traffic deaths and serious injuries requires strengthening all five elements.



Safe System Approach | Safe Road Users

The safety of all road users is equitably addressed, including those who walk, bike, drive, ride transit, or travel by other modes.



Demographic Data

Know the demographic makeup of a region to draw correlation on how citizens will use roadways, and if roads can safely accommodate



Vehicle Availability Metrics

Identify vehicles available by households to better understand how this will impact commuting patterns



Bike / Ped Data

Data to gauge effectiveness (or need) for additional sidewalks, complete streets and other incident management techniques



Transit Ridership

Gather a holistic view of how well fleets service a community and where they can be used to address safety issues (last mile, etc.)

Safe System Approach | Safe Vehicles

Vehicles are designed and regulated to minimize the frequency and severity of collisions using safety measures that incorporate the latest technology.



CAV Data

Understanding movement patterns of autonomous vehicles belonging to public transit agencies and the private sector



School District Data

Knowing schools in the area provides a clearer picture of school bus routes, times, and travel patterns



Corridor Devices

Intelligent transportation systems, devices, and infrastructure to collect and share data on travel trends and velocities



Electric Vehicles

A clear understanding of new EV charging stations to both monitor their impact on travel and safety issues (e.g. fire safety concerns)

Safe System Approach | Safe Speeds

Humans are less likely to survive high-speed crashes. Reducing speeds can accommodate human-injury tolerances in three ways: reducing impact forces, providing additional time for drivers to stop, and improving visibility.



Speed Data

Analyze travel speeds and congestion on roadways to determine when and where speed reduction is necessary



Travel Times

Tracking roadway travel times for route analysis to understand their correlation with speed and crash reports



Congestion Management

Providing near-real-time information system performance and delivering strategies that improve performance



Trip Data

Understand the origins and destinations of intermodal commuting and measuring those trends against speed metrics

Safe System Approach | Safe Roads

Designing transportation infrastructure to accommodate human mistakes and injury tolerances can greatly reduce the severity of crashes that do occur — such as alerting users to hazards, construction, and other road users.



Contributing Crash Factors

Holistic evaluation of performance metrics to determine the variety of reasons for crashes, fatalities, and incidents across roadways



Workzone Intelligence

Clear representation and understanding of the WZDx to smartly plan projects and increase awareness of active responders



Bridge Conditions

Monitoring and alerting the public to volumes and bridge conditions based off reporting from the National Bridge Inventory NBI.



Incident Mitigation

Roadway data and incident detection sensors across dangerous corridors to reduce secondary crashes

Safe System Approach | Post-Crash Care

People who are injured in collisions rely on emergency first responders to quickly locate and stabilize their injuries and transport them to medical facilities, as well as forensic analysis at the crash site and traffic incident management



Fatality Analysis

Consistent analysis of roadway deaths, their times of occurrence, contributing factors, and any historical trends



Response Times

Efficiently deploying first responders to crash scenes by knowing in advance where the greatest chance of disruption will occur.



Clearance Times

Measuring and managing clearance times to ensure roads maintain efficient LOS after a disruptive incident occurs



Crash Forecasting

Leveraging historical crash data, corridor devices, and environmental data to show dangerous road segments and corridors

“No longer can we as a society accept traffic deaths as routine. Every life lost is a tragedy, and we all can, should, and must do more to change the culture. The National Roadway Safety Strategy and the Safe System Approach offer all communities a **roadmap to save lives and reduce injuries**”

- Dr. Steve Cliff

Deputy Administrator

NHTSA

The future of safer roads depends on
quality data and smart planning

Clean data pipelines are an integral part of holistic safety action plans



Speed

Analyze travel speeds and congestion on roadways.



Travel Time

Track roadway travel times for road segment and route analysis.



Congestion

Measure heavy congestion across roadways and routes.



Fatality Analysis (FARS)

Measure crashes, rates, fatalities, dangerous roads.



Trips

Report origin and destination for intermodal and commuting.



Education

The highest level of education individuals have completed.



Income Inequality

GINI Index measuring the dispersion of income across households.



Vehicle Availability

Identifies the vehicles available by household.



Disability

Percentage of the population living with a disability by census tract.



Bridges

Bridge maintenance conditions and reporting from the NBI.



School Districts

Identify school district polygons for chosen location.



Income

Median household income in last 12 months, adjusted for inflation.



Congressional Districts

Identify the congressional district polygons for chosen location.



Commuter Travel Time

Avg. number of minutes commuters spends traveling to work daily.



Demographics

Age, population, gender, race, english proficiency, ancestry.

Safety reporting: implementation and system performance

Accurate safety reporting leverages enriched datasets that planners use to visualize trends and share a holistic view of their region.



Index

Integrate national, state, and local safety databases and run initial quality audits



Enrich

Enrich internal data to improve accuracy and expand insights



Visualize

Display, analyze, and report geospatial and time series of crash and safety measure.



Manage

Maintain and update reports in collaborative workspaces with data feeds.



Safety Planning Use Case



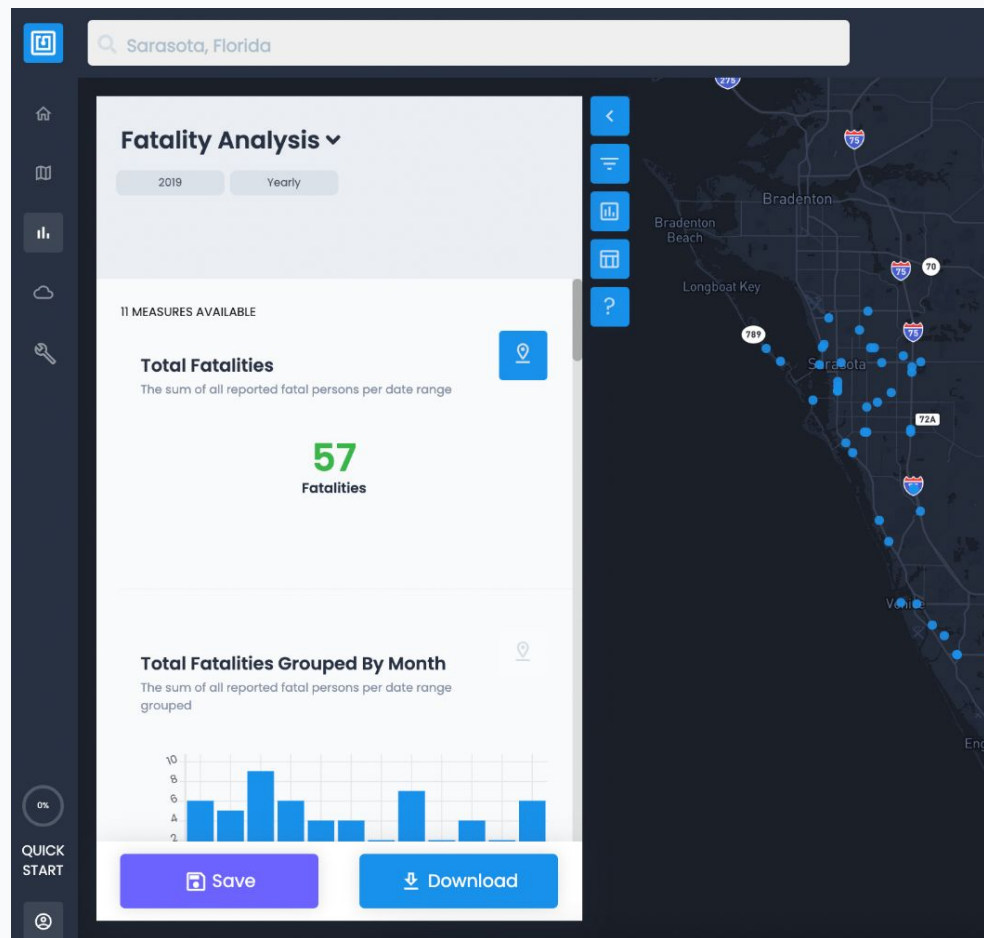
The fatality analysis report identifies fatal crashes by location and year.

Metrics include:

- Number of fatalities
- Number of non-motorized (bicycle and pedestrian) fatalities and serious injuries

Datasource: NHTSA FARS

Outcome: Increased operational efficiency, clearer reporting visuals of hot corridors



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