



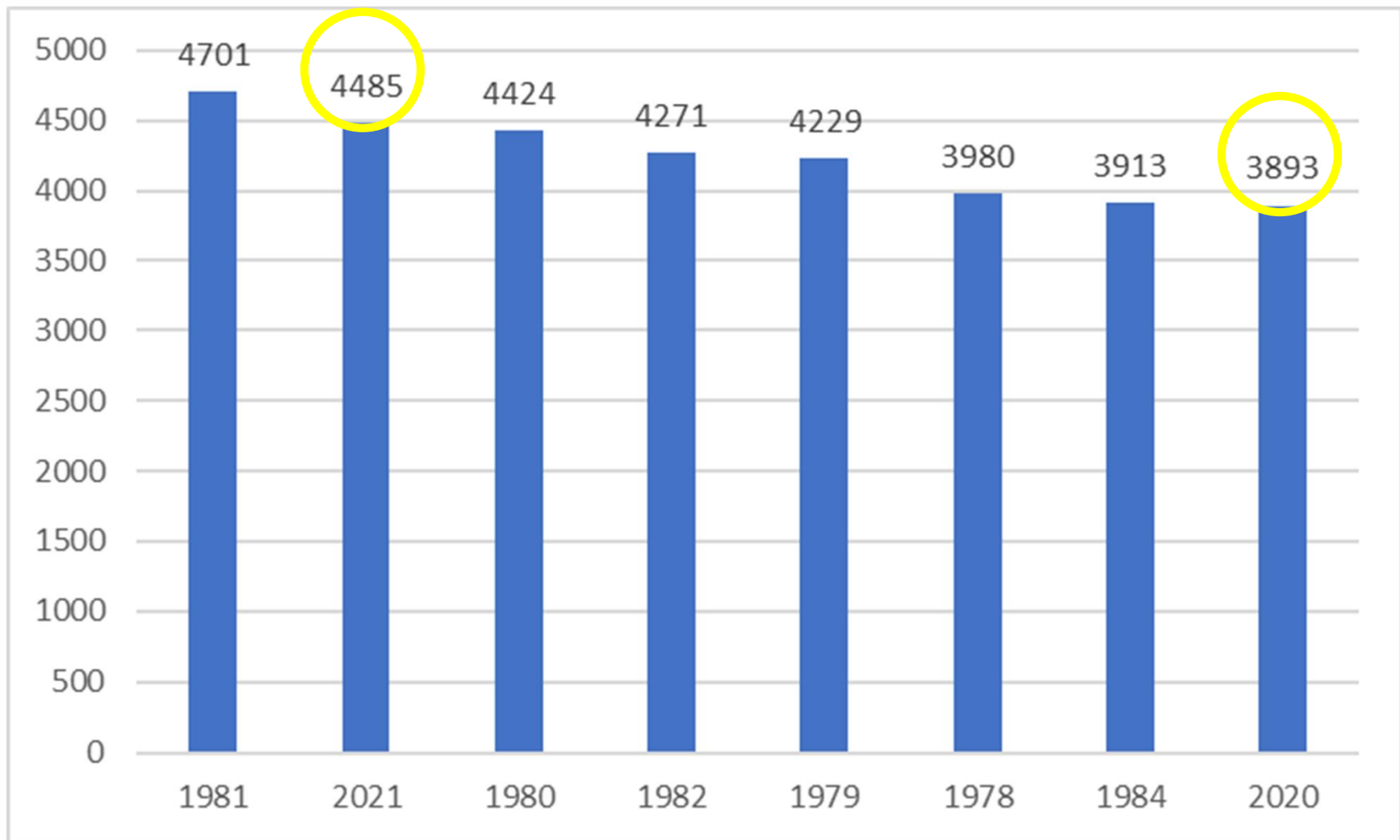
Vision Zero, Safety Plans, and IIJA Safety Funding

Dhruva Lahon, P.E., PTOE
TexITE Dallas Section Meeting
March 11, 2022



4485

Highest Traffic Fatalities by Year





Vision Zero

- “Vision Zero is a strategy to eliminate all traffic fatalities, while increasing safe, healthy, equitable mobility for all.” (Vision Zero Network)

Traditional vs. Vision Zero Approach

TRADITIONAL APPROACH

Traffic deaths are **INEVITABLE**

PERFECT human behavior

Prevent **COLLISIONS**

INDIVIDUAL responsibility

Saving lives is **EXPENSIVE**

VS

VISION ZERO

Traffic deaths are **PREVENTABLE**

Integrate **HUMAN FAILING** in approach

Prevent **FATAL AND SEVERE CRASHES**

SYSTEMS approach

Saving lives is **NOT EXPENSIVE**

Source: Vision Zero Network

Vision Zero Minimum Requirements

- Goal and timeframe for elimination of fatalities
- Mayor officially committing to Vision Zero
 - Directing staff to prioritize Vision Zero
- Action Plan in place
- Key departments actively engaged
 - Transportation
 - Public health
 - Law enforcement
- Regular task force meetings to evaluate efforts

5 Es of Safety



Safety Plan

State
Strategic
Highway
Safety Plan

Safety Action
Plan
- Regional
- Local

HSIP
State Funds
New IIJA Funds

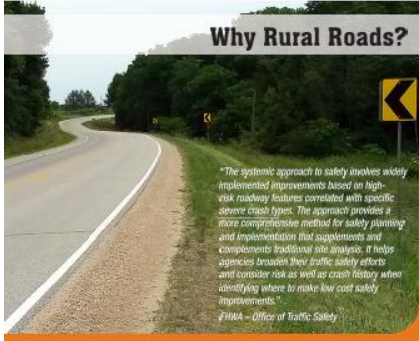


Distracted Driving
Impaired Driving
Intersection Safety
Older Road Users
Pedestrian Safety
Roadway and Lane Departures
Speeding

Safety Plan Example



Elevating Safety on Rural Roads: The Local Road Safety Plan



Why Rural Roads?

"The systemic approach to safety involves widely implemented improvements based on high-risk roadway features correlated with specific severe crash types. The approach provides a more comprehensive method for safety planning and implementation that supplements and complements traditional site analysis. It helps agencies broaden their traffic safety efforts and consider risk as well as crash history when identifying where to make low cost safety improvements."
FHWA - Office of Traffic Safety

"In 2012, 19% of the US population lived in rural areas but rural road fatalities accounted for 54% of all fatalities. Even with reductions in the number of fatalities on the roadways, the fatality rate in rural areas is 2.4 times higher than the fatality rate in urban areas."
—FHWA - Office of Traffic Safety

What is a Local Road Safety Plan (LRSP)?

- A document that provides a basis for systemic safety improvements along local roads
- Rather than addressing "black spots," it identifies proactive safety based on a risk factor analysis of the roadway
- LRSPs not only assist locals in understanding the types of crashes occurring on local roadways, they define a locally focused plan for practitioners to make informed, prioritized safety decisions
- The LRSP process has been successfully initiated in several states including Iowa, Minnesota and North Dakota and is under way in Nebraska and Kansas.

Benefits of LRSPs

- Coordination between various agencies within the County
- Use analysis results to leverage and apply for funding
- Focus on all the five Es of safety

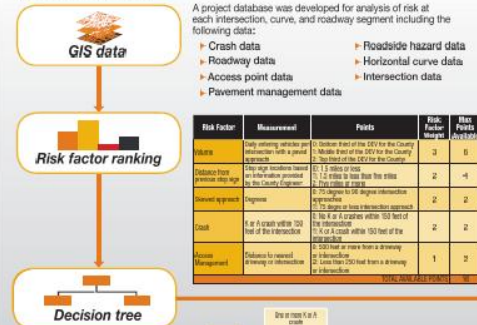
"In Iowa, more than 50% of K&A (fatal and serious injury) crashes occurred on rural roads from 2004-2013, resulting in crash rates on rural roads more than twice that of state-maintained roads."
—Iowa Local Road Safety Plans

Purpose of the LRSP

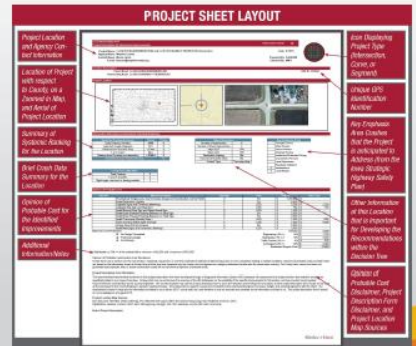
- Systemic analysis of crash data to identify area-specific crash characteristics to be addressed
- Apply the principles established in the state's Strategic Highway Safety Plan (SHSP)
- Consider constraints within the local network and incorporate feedback from the local stakeholders
- Provide recommendations focused on transportation improvements with a high benefit of crash reductions
- Identify a prioritized list of safety improvement projects



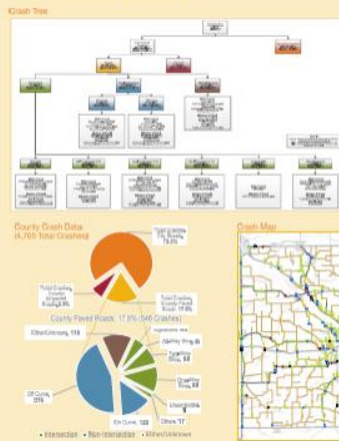
Methodology



Developed to aid in Highway Safety Improvement Program (HSIP) application process for safety funding on rural roads



Crash Data and Driver-Related Countermeasures



Project Process

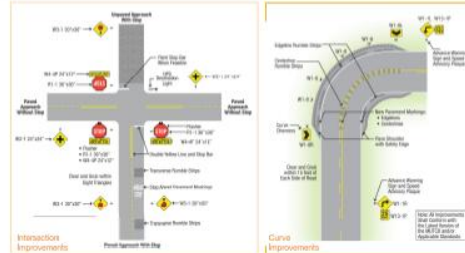


Intersection Risk Score Map



What Can Be Done?

- LRSPs have an emphasis on practical, low-cost and proven countermeasures as detailed in:
- NCHRP 500
 - NHTSA
 - FHWA Proven Countermeasures
 - Towards Zero Deaths
 - CMF Clearinghouse
- Countermeasures are selected by a data-driven approach

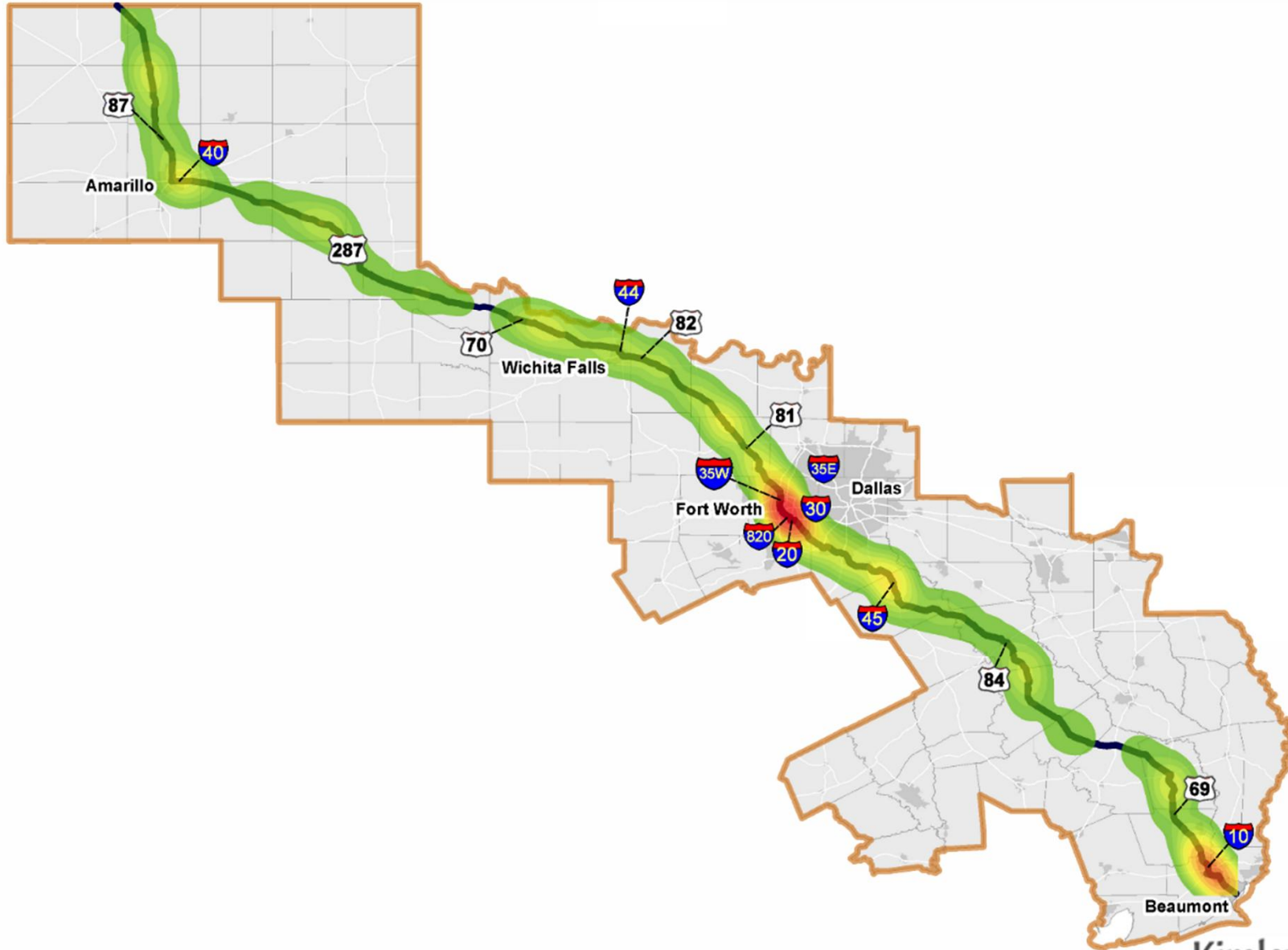


Project Summary

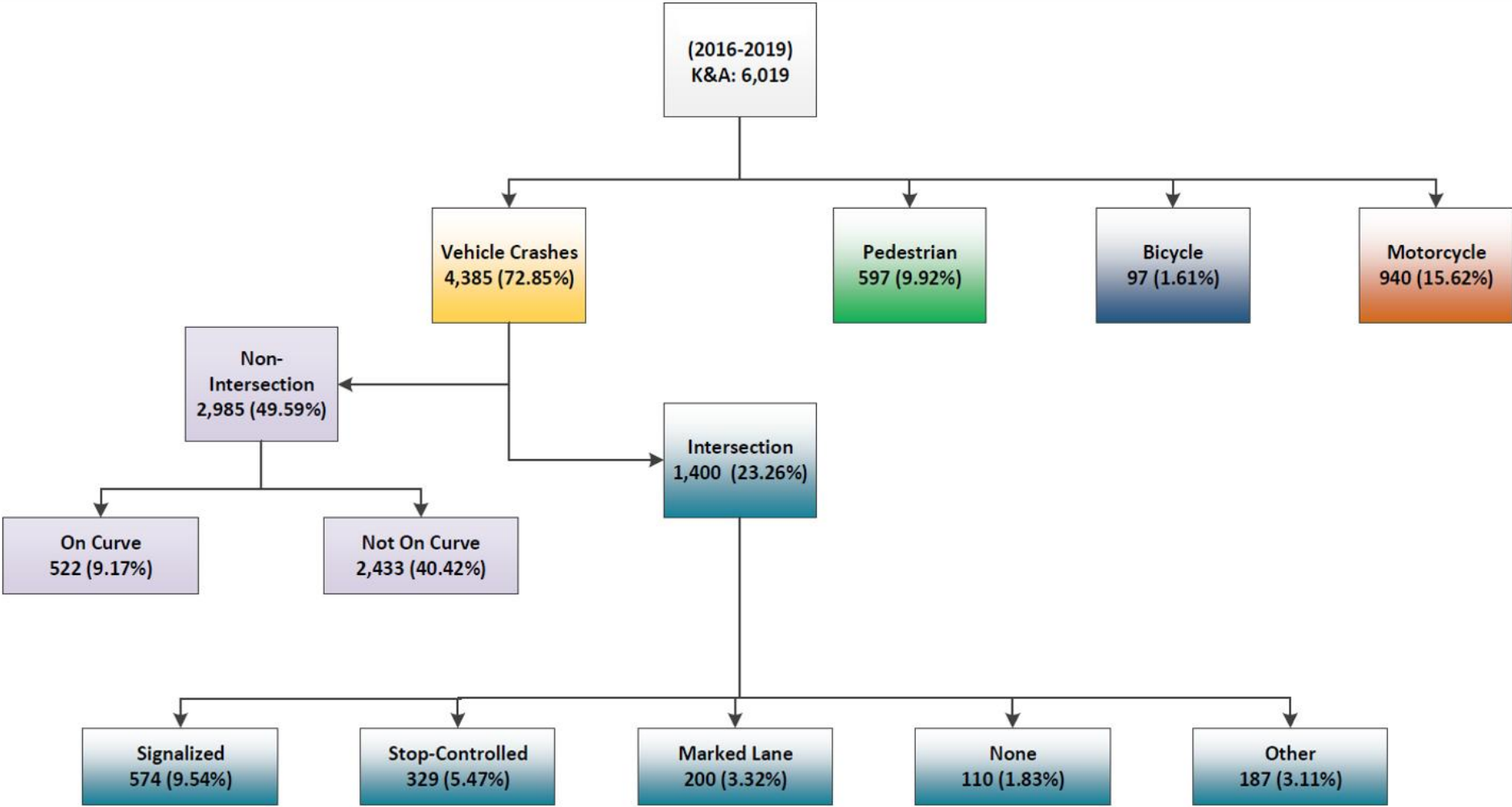
- \$66M in short-term, low-cost safety improvements at 569 locations
- 12 counties
- 11,000 miles of roadway, 3,600 intersections, 1,200 curves
- 24 workshops (2 in each county), 8,000+ miles traveled
- 79 safety stakeholders involved:
 - County engineers/staff
 - County Sheriff
 - County Fire
 - County Board of Directors
 - School Board Members
 - DOT Representatives
 - State Patrol Troopers
 - Local Media



Crash Heat Map

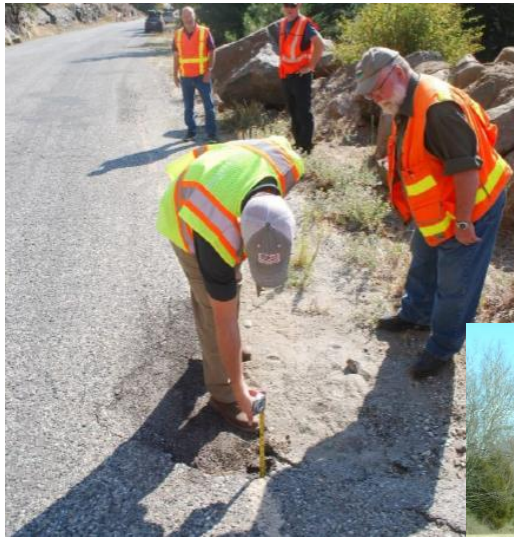


Crash Tree



High Risk Assessment

- Identify high risk roadway features
- Use data-driven process to proactively reduce fatal and serious injury crashes
- Design forgiving roadways



Countermeasure Resources

- NCHRP 500 Reports
- Highway Safety Manual
- FHWA crash modification factor clearinghouse
- TxDOT HSIP Work Codes

CMF
CRASH MODIFICATION FACTORS CLEARINGHOUSE

Quick Search
enter search term(s)
- narrow by countermeasure category -
- narrow by crash type -
- narrow by crash severity -
- narrow by roadway type -
Advanced Search
Need Help? [Search CMF's](#)

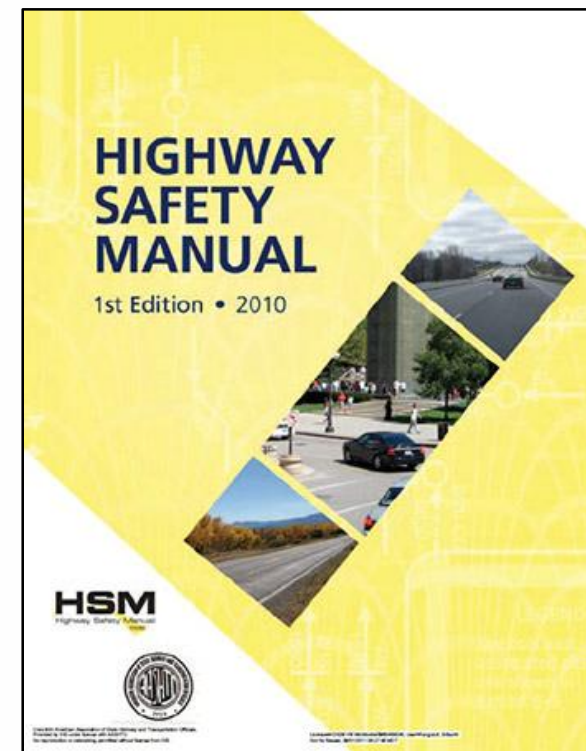
Featured Resource:
Desktop Reference for Crash Reduction Factors
Developed by the Federal Highway Administration, the Desktop Reference is a compilation of CRFs relating to intersections, roadway departure and other non-intersection crashes, and pedestrian crashes.

Recently Added CMFs

Design diamond, trumpet or cloverleaf interchange CMF: 0.96 CRF: 4	Physical channelization of left-turn lane on major road CMF: 0.73 CRF: 27	Flashing beacons at four leg stop controlled intersections CMF: 0.87 CRF: 13
--------------------------------------------------------------------------	---------------------------------------------------------------------------------	------------------------------------------------------------------------------------

A crash modification factor (CMF) is a multiplicative factor used to compute the expected number of crashes after implementing a given countermeasure at a specific site. The Crash Modification Factors Clearinghouse houses a Web-based database of CMFs along with supporting documentation to help

101	Install Warning/Guide Signs	
	Definition:	Provide advance signing for unusual or unexpected roadway features where no signing existed previously.
	Reduction Factor (%):	20
	Service Life (Years):	6
	Maintenance Cost:	N/A
	Preventable Crash:	(Vehicle Movements/Manner of Collision = 20–22 or 30) OR (Roadway Related = 2, 3 or 4)



TxDOT HSIP Countermeasures



Highway Safety Improvement Program Guidelines

Traffic Safety Division

September 2021

Work Code (Combo)	Description	Reduction Factor	Service Life
510	Construct Turn Arounds	40%	10
514	Grade Separation	80%	30
515	Construct Interchange	65%	30
516	Close Crossover	50%	20
517	Add Through Lane	28%	20
518	Install Continuous Turn Lane	50%	10
519	Add Left Turn Lane	25%	10
520	Lengthen Left Turn Lane	40%	10
521	Add Right Turn Lane	25%	10
522	Lengthen Right Turn Lane	40%	10
523	Construct Pedestrian Over/Under Pass	95%	20
524	Increase Turning Radius	10%	10
525	Convert to One Way Frontage Roads	68%	10
532	Milled Edgeline Rumble Strips	15%	10
533	Profile Edgeline Markings	7%	5

FHWA Proven Countermeasures

ROADWAY DEPARTURE



Wider Edge Lines



Enhanced Delineation for Horizontal Curves



Longitudinal Rumble Strips and Stripes on Two-Lane Roads



SafetyEdgeSM



Roadside Design Improvements at Curves



Median Barriers

INTERSECTIONS



Backplates with Retroreflective Borders



Corridor Access Management



Dedicated Left- and Right-Turn Lanes at Intersections



Reduced Left-Turn Conflict Intersections



Roundabouts



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

CROSSCUTTING



Pavement Friction Management



Lighting



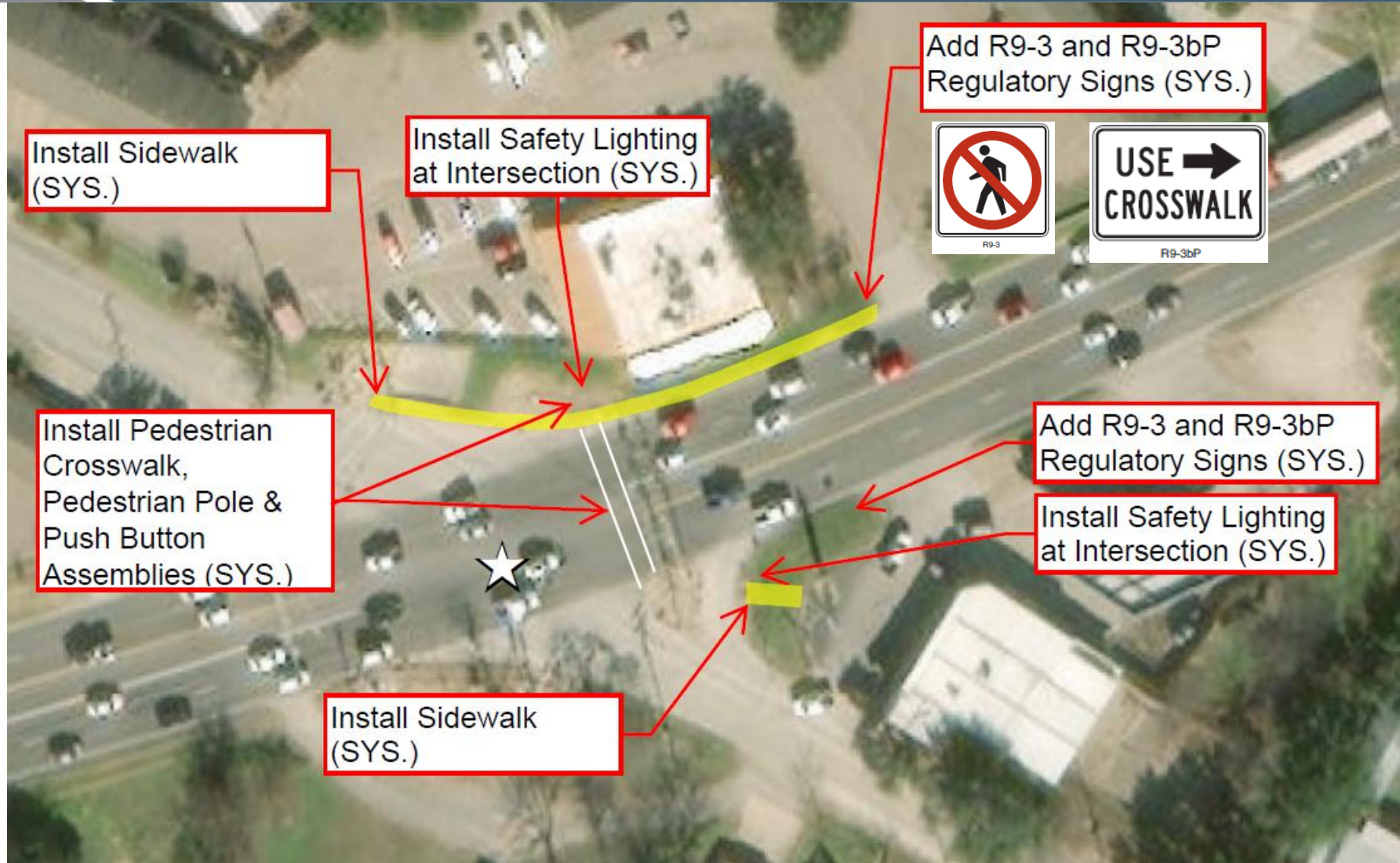
Local Road Safety Plans



Road Safety Audit

FHWA-SA-21-082

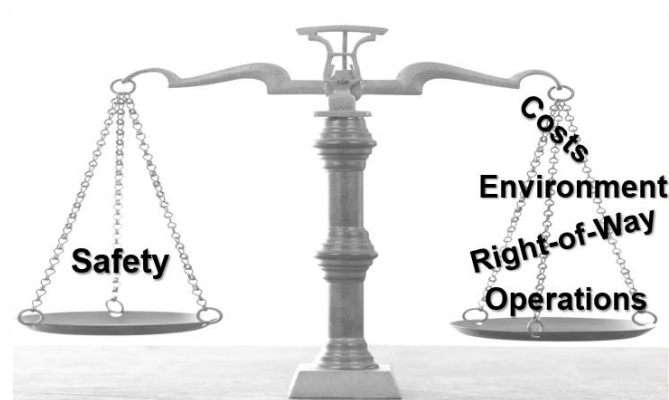
Project Recommendations



Map Source: Nearmap

Project Prioritization

- Benefit/Cost Analysis
 - Safety Improvement Index (SII)
- Identify project order:
 - Funding
 - Other programmed projects
 - Project plans needed? Shovel ready?
 - Environmental/Public Involvement



Safety Dashboard

zero Fatalities
Lives are on the Line

- All Crashes
- Bicyclists
- Restrained Children
- Commercial Vehicles
- Distracted Driving
- Impaired Driving
- Intersections
- Lane Departures
- Motorcyclists
- Unhelmeted Motorcyclists
- Older Drivers
- Pedestrians
- Speeding Related
- Unrestrained
- Young Drivers

Nevada Fatal Crash Data

Clear Filters



Nevada Crash Fatalities
1599
Fatalities

Year

2015 2019

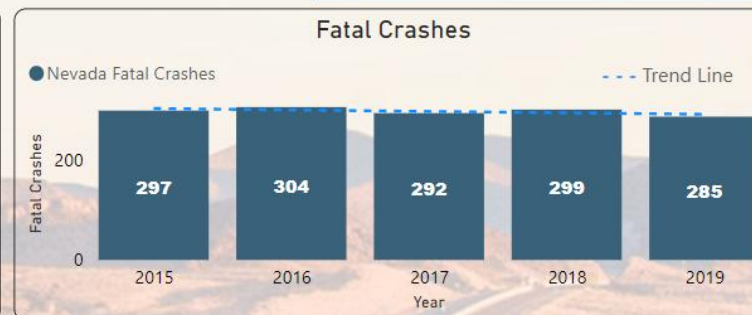
County

All

City

All

Nevada Fatal Crashes
1477
Fatal Crashes



Click Below For More Detail

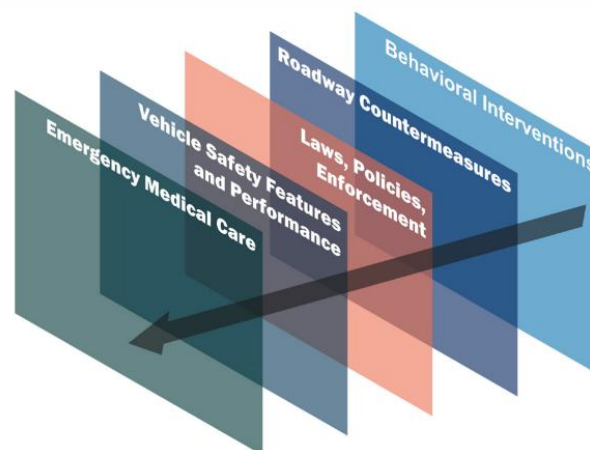
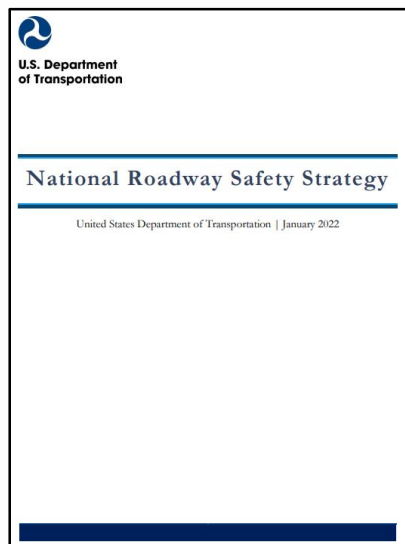
Attention: Microsoft is working through glitches in Power BI, you may need to re-click the emphasis area button to display the correct charts.



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IIJA Funding

- USDOT's National Roadway Safety Strategy:
 - \$5 billion for the Safe Streets and Roads for All
 - \$4 billion in additional funding for HSIP
 - \$4 billion in additional funding for improved crash data and vehicle, behavior, truck safety



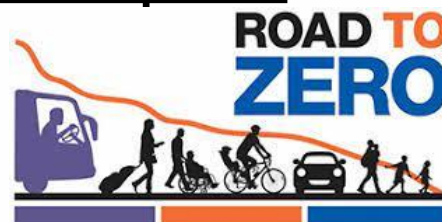
Source: FHWA



Safe Streets and Roads for All

Safe Streets and Roads for All

- Advance "Vision Zero" safety plans and complete street improvements to reduce crashes and fatalities, especially for cyclists and pedestrians
 - Develop a comprehensive safety action plan
 - Conduct planning, design, develop strategies identified in a comprehensive safety action plan
 - Implement projects and strategies identified in a comprehensive safety action plan





Safe Streets and Roads for All

- Project examples:
 - Multi-modal improvements
 - Bike lanes
 - Pedestrian improvements (crossing, sidewalk)
 - Traffic calming, speed management
 - Lighting
 - Rumble strips
 - Signs, flashing beacons

Safe Streets and Roads for All

- Recipients:
 - Metropolitan Planning Organization (MPO)
 - Local Government
 - Tribal Government
 - Multi-jurisdictional group of entities listed above
- Funding: \$ 5 billion (\$ 1 billion/yr)
- Federal Share: 80%
- NOFO: May 2022
- Funding award: End of 2022

Stopping Threats on Pedestrians



Stopping Threats on Pedestrians

- Bollards to prevent pedestrian injuries and terrorism acts in high-volume pedestrian areas on Federal-aid eligible highways
- Recipients:
 - State or political subdivision of a State
 - Local Government
- Funding: \$25 million (\$5 million/yr)
- Federal share: 100%



Safety bollards designed by Kimley-Horn ensured this errant vehicle resulted in no injuries, though it occurred within feet of a populated pedestrian area on the Las Vegas Strip.



Active Transportation Infrastructure Investment

Active Transportation Infrastructure Investment

- Grants for safe and connected active transportation facilities in a spine or network
- Recipients:
 - State, or political subdivision of a State
 - Metropolitan Planning Organization (MPO)
 - Regional Transportation Planning Organization
 - Multi-County Special District
 - Local Government
 - Tribal Government





Active Transportation Infrastructure Investment

- Funding: \$ 1 billion (\$200 million/yr)
- Federal share: 80% (100% - If majority of census tracts have poverty rate > 40%)
- NOFO: 1st quarter 2022



Railroad Crossing Elimination Program

Railroad Crossing Elimination Program

- Grants for highway-rail or pathway-rail crossing improvement projects to improve the safety and mobility of people and goods
- Recipients:
 - State Department of Transportation (DOT)
 - Territorial Government
 - Metropolitan Planning Organization (MPO)
 - Local Government
 - Tribal Government



W10-1




W10-2



Railroad Crossing Elimination Program

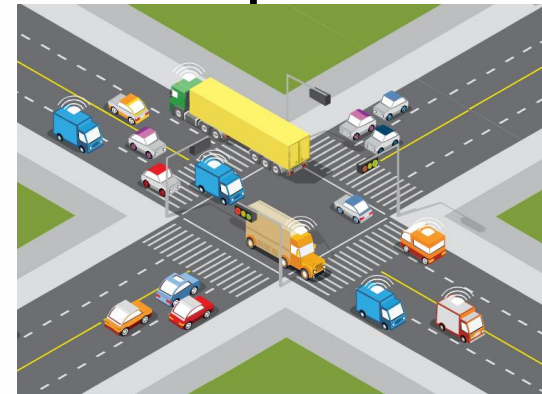
- Funding: \$ 3 billion (\$600 million/yr)
- Federal Share: 80%
- First round released December 2021
- Next round to be released October 2022



Strengthening Mobility and Revolutionizing Transportation (SMART)

Strengthening Mobility and Revolutionizing Transportation (SMART)

- Grants to conduct demonstration projects focused on advanced smart city or community technologies/systems to improve transportation efficiency and safety
 - Coordinated automation
 - Connected vehicles
 - Intelligent sensor-based infrastructure
 - Intelligent transportation system integration
 - Smart grid development/deployment
 - Smart-technology traffic signal deployment



Strengthening Mobility and Revolutionizing Transportation (SMART)

- Recipients:
 - State Department of Transportation (DOT)
 - Metropolitan Planning Organization (MPO)
 - Local Government
 - Tribal Government
 - Public Transit Agency/Authority
 - Public Toll Authority
 - Groups of entities listed above
- Funding: \$ 500 million (\$ 100 million/yr)



THANK YOU

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