

Roadway Departures & Intersection-related Crashes Emphasis Area

Co-chairs

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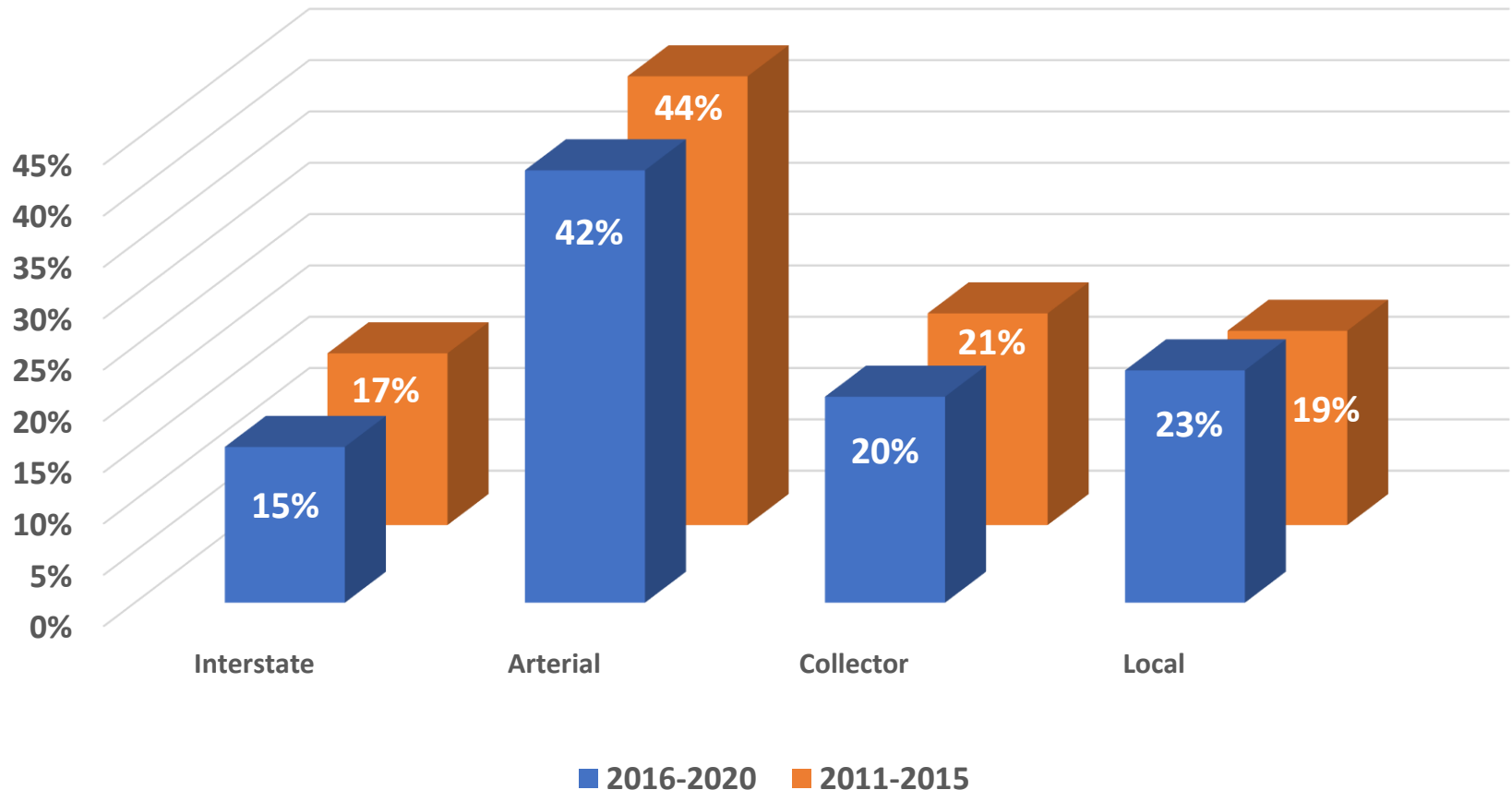


Objective:

- Reduction in number of roadway departure crash fatalities
- Reduction in number of roadway departure crash serious injuries

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- Reduction in number of intersection-related crash fatalities
 - Reduction in number of intersection-related serious injuries

Fatality & Serious Injuries by Road Function, 5-Year Comparison

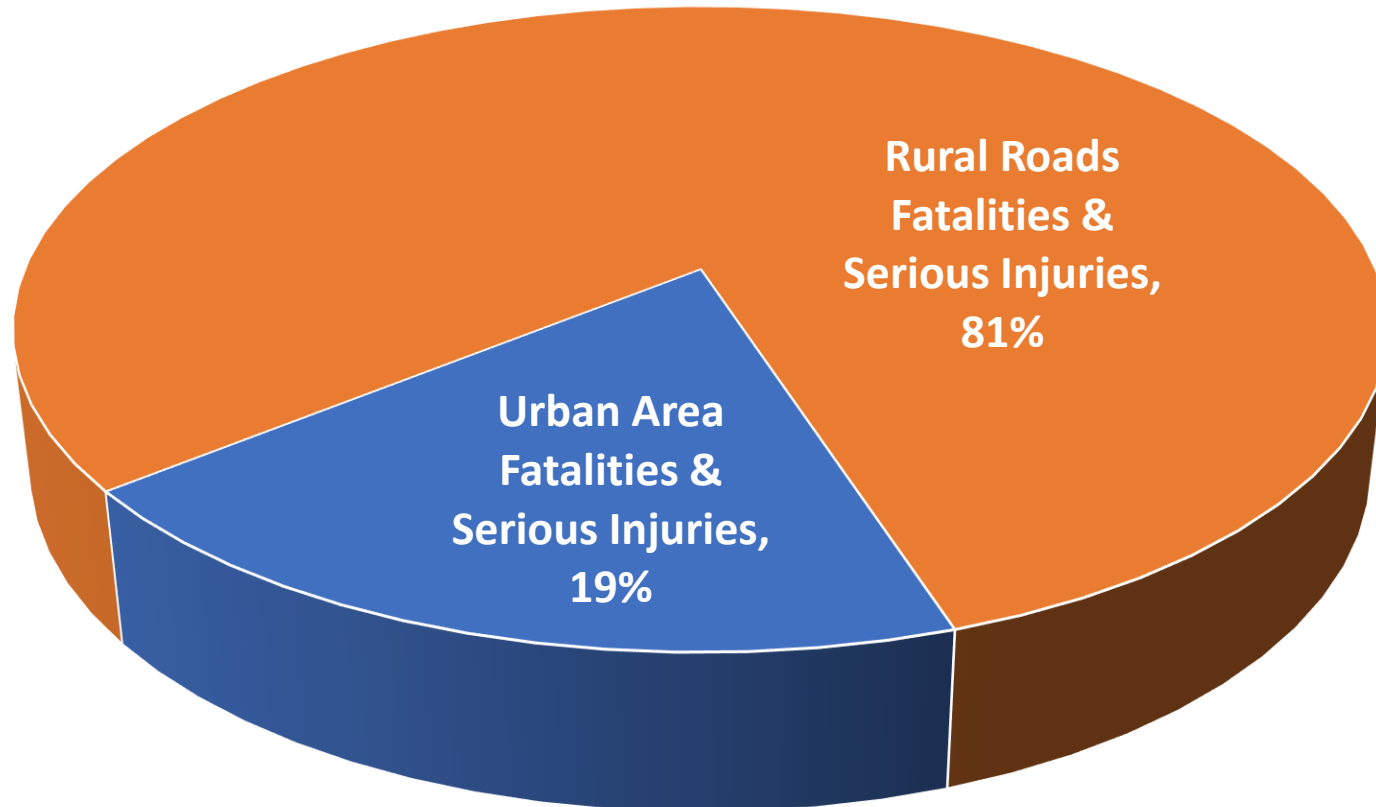


A closer look at the recent 5 years (2016-2020) to the past 5 years (2011-2015) shows:

*** A decrease on all higher classification roads**

*** An increase on local roads**

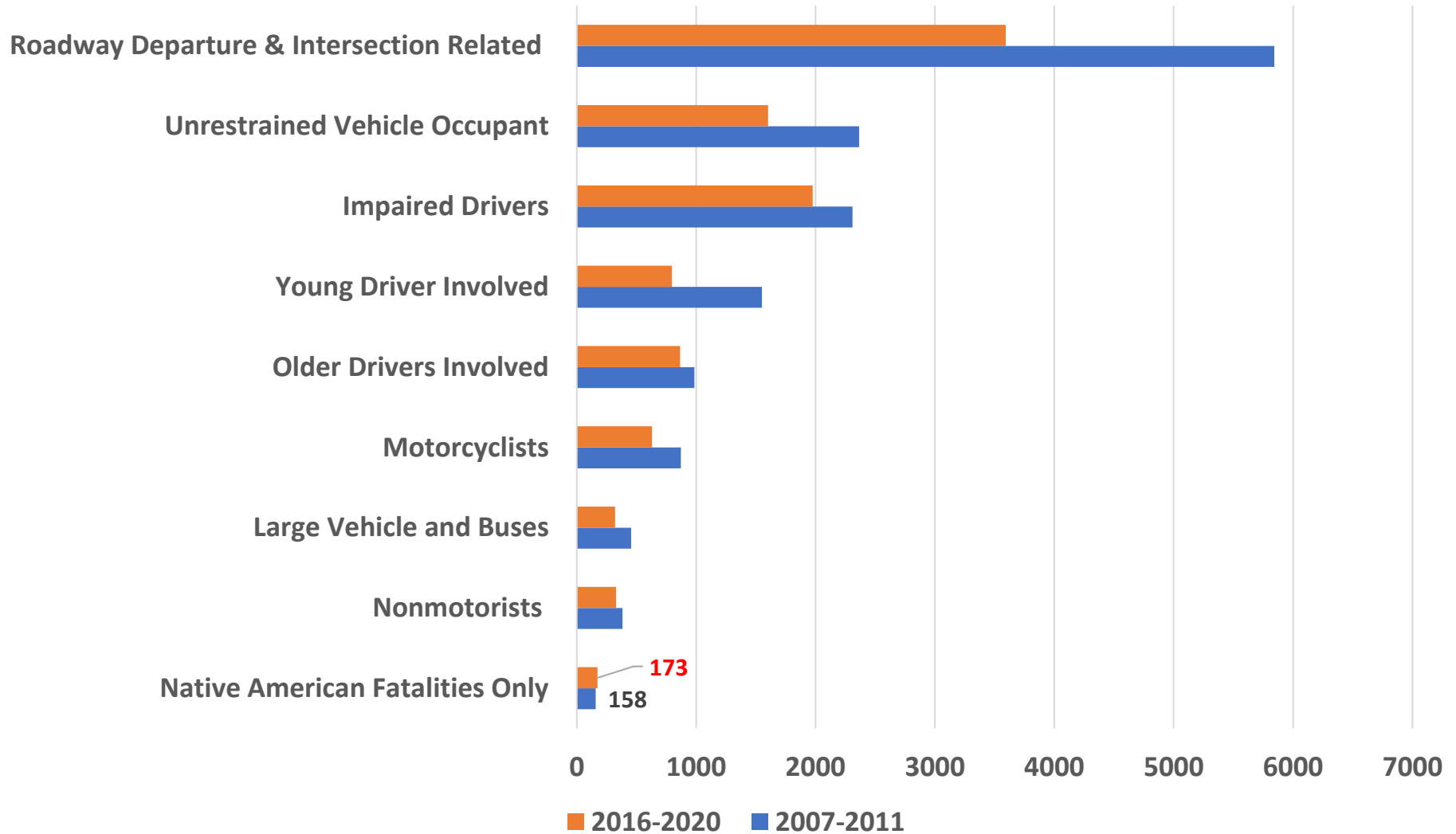
Rural Roads vs Urban Area Fatalities & Serious Injuries, 2011-2020



■ Urban Area Fatalities & Serious Injuries

■ Rural Roads Fatalities & Serious Injuries

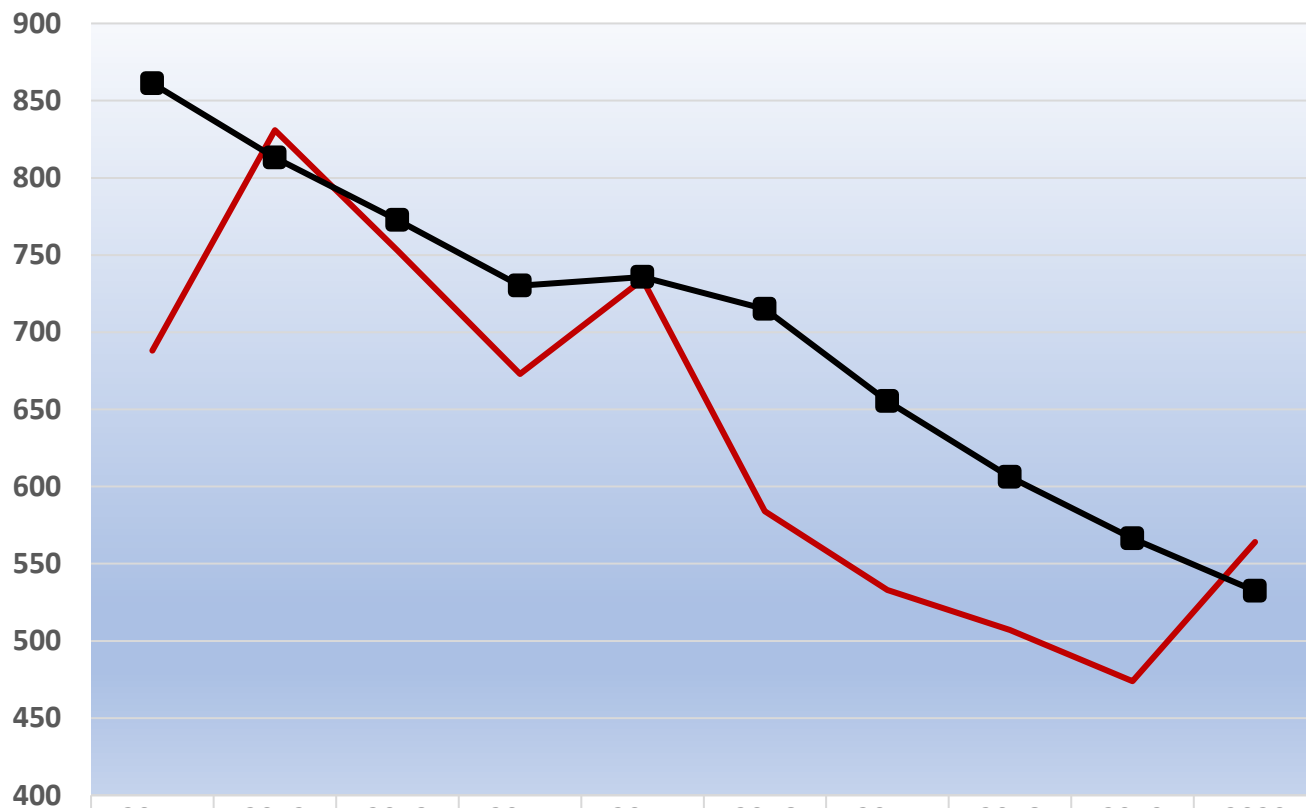
Fatal & Serious Injuries Associated Key Emphasis Areas, First 5-Years vs Recent 5-Years of Implementation





Roadway Departure
Fatalities & Serious
Injuries, 2011-2020

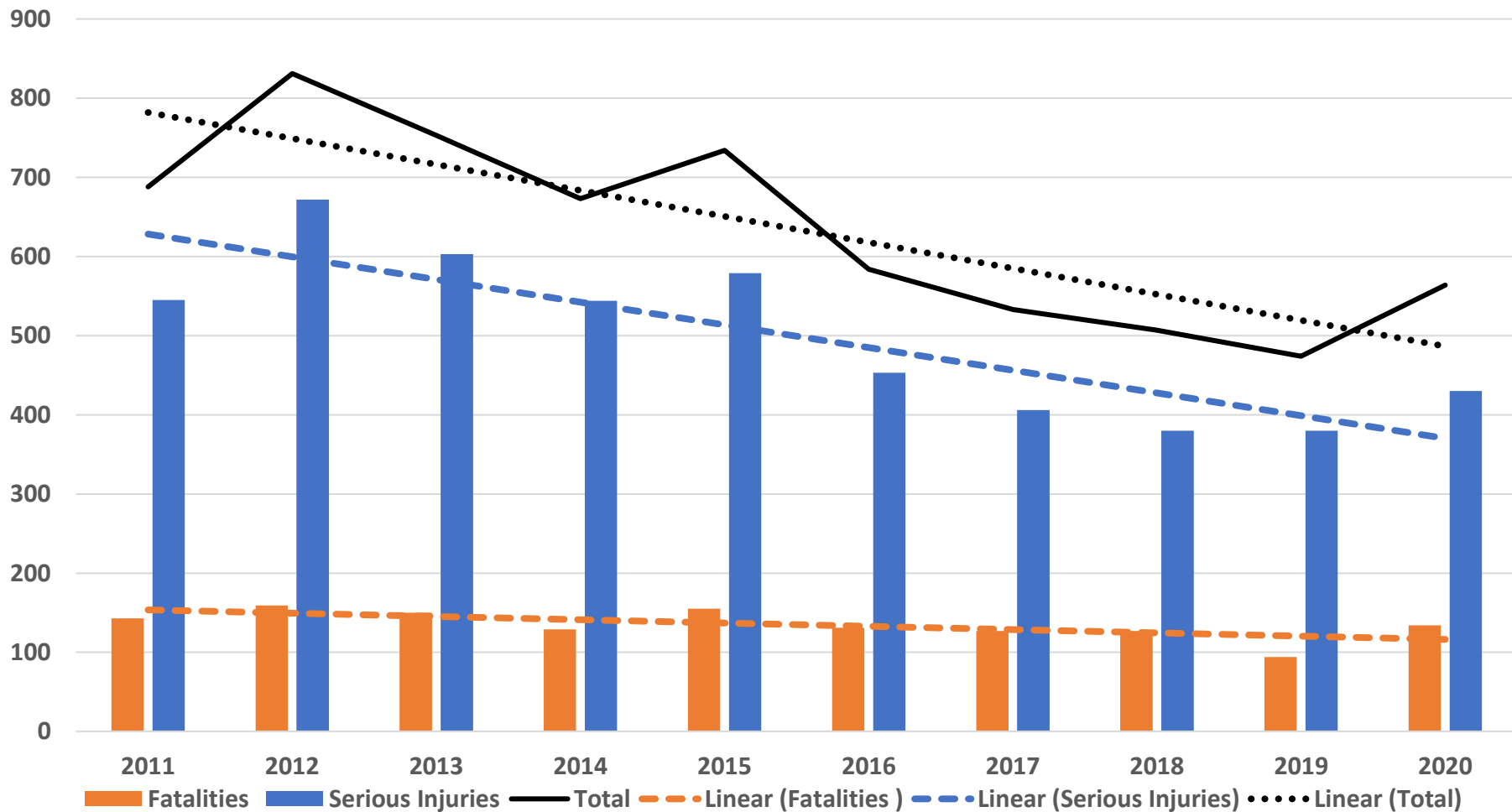
Roadway Departure Fatalities & Serious Injuries, 2011-2020



	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
All Fatalities & Serious Injuries	688	831	753	673	734	584	533	507	474	564
5-Year Average	861	813	773	730	736	715	655	606	566	532
Fatalities	143	159	150	129	155	131	127	127	94	134
Serious Injuries	545	672	603	544	579	453	406	380	380	430

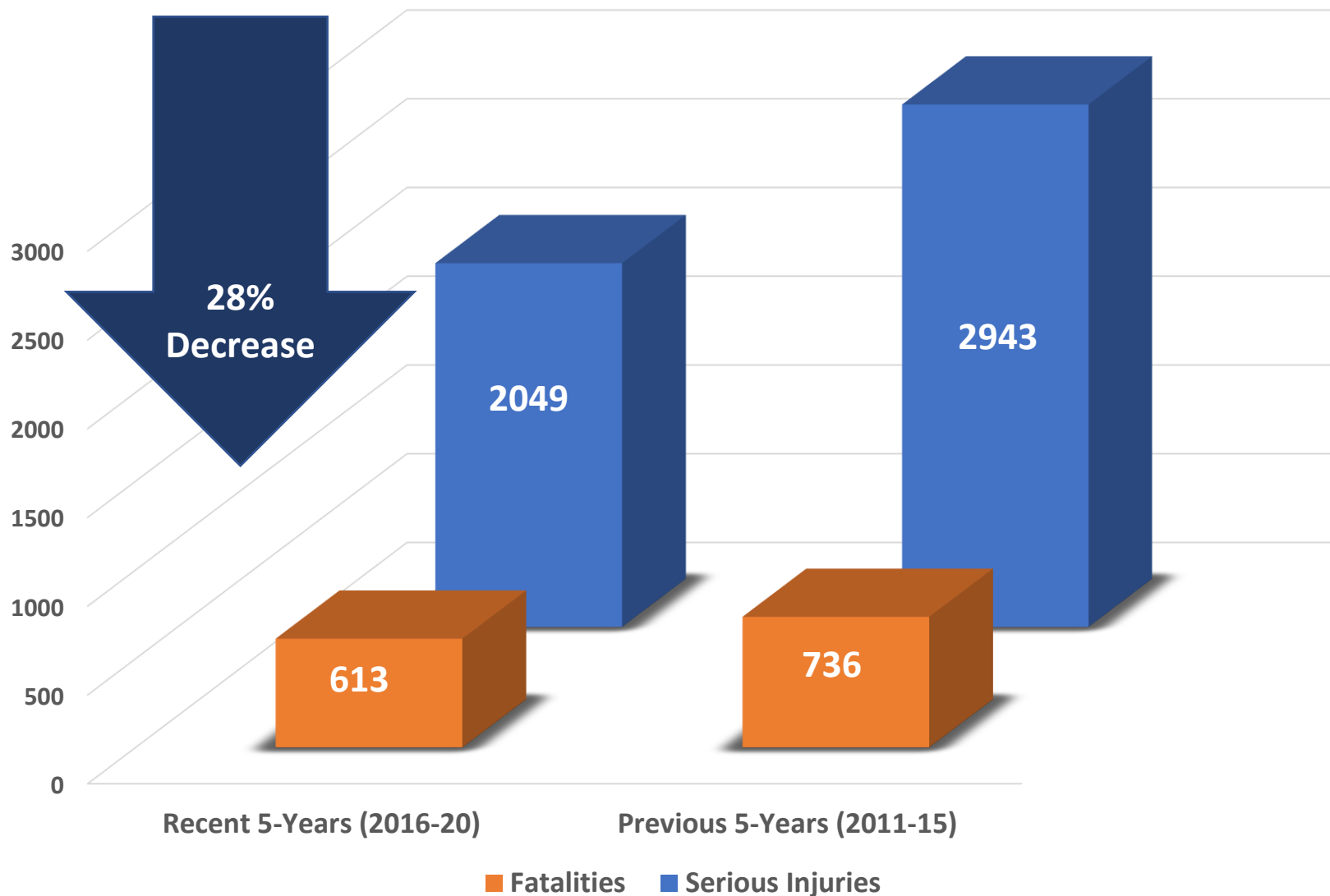
**In 2020 there was a spike in roadway fatalities & serious injuries.
Overall, the trend continues to decrease.**

Roadway Departure Fatalities & Serious Injuries, 2011-2020



Breaking down the fatalities and serious injuries show that while fatalities have remained the same, serious injuries have decreased.

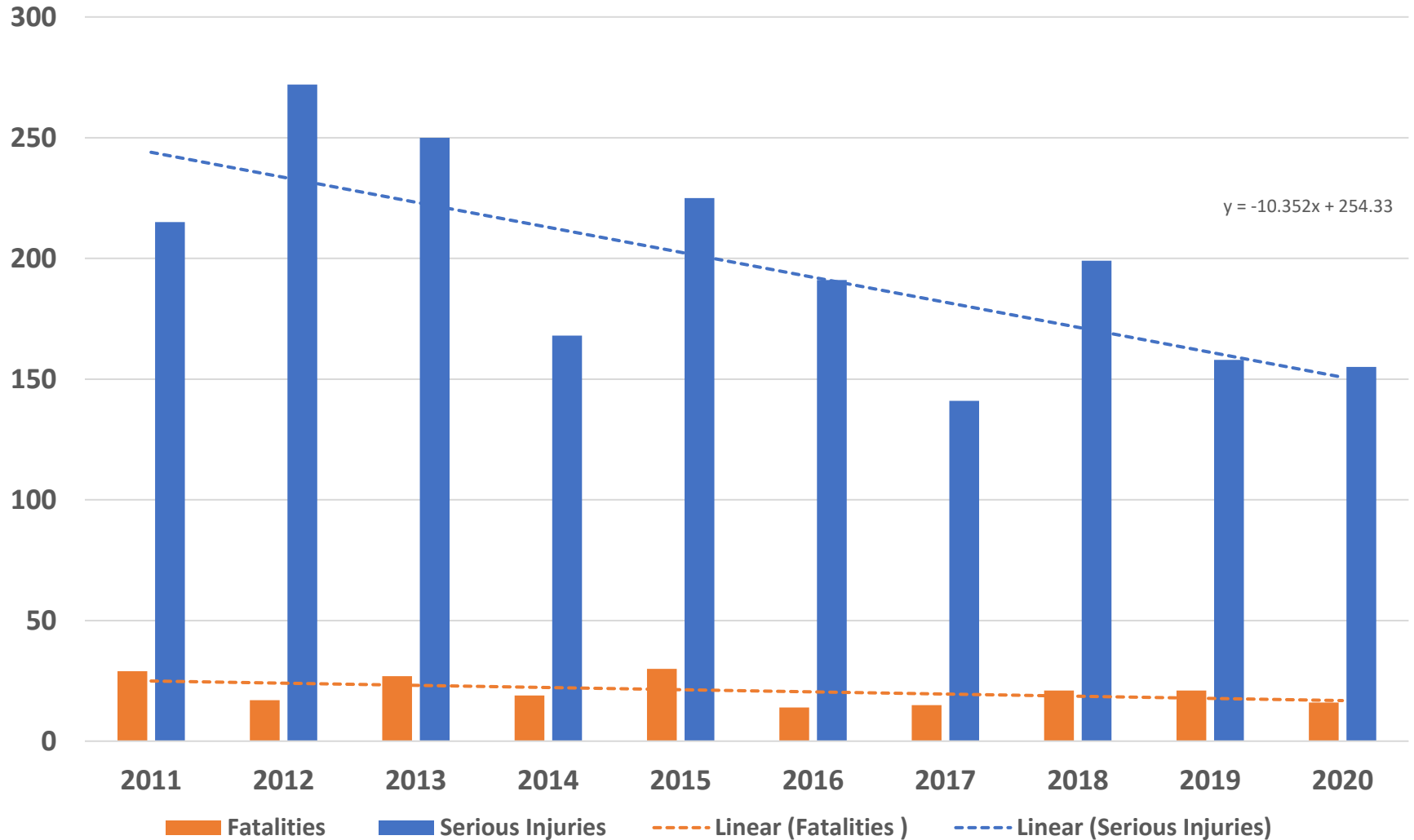
Roadway Departure Fatalities & Serious Injuries, 5-Year Comparison





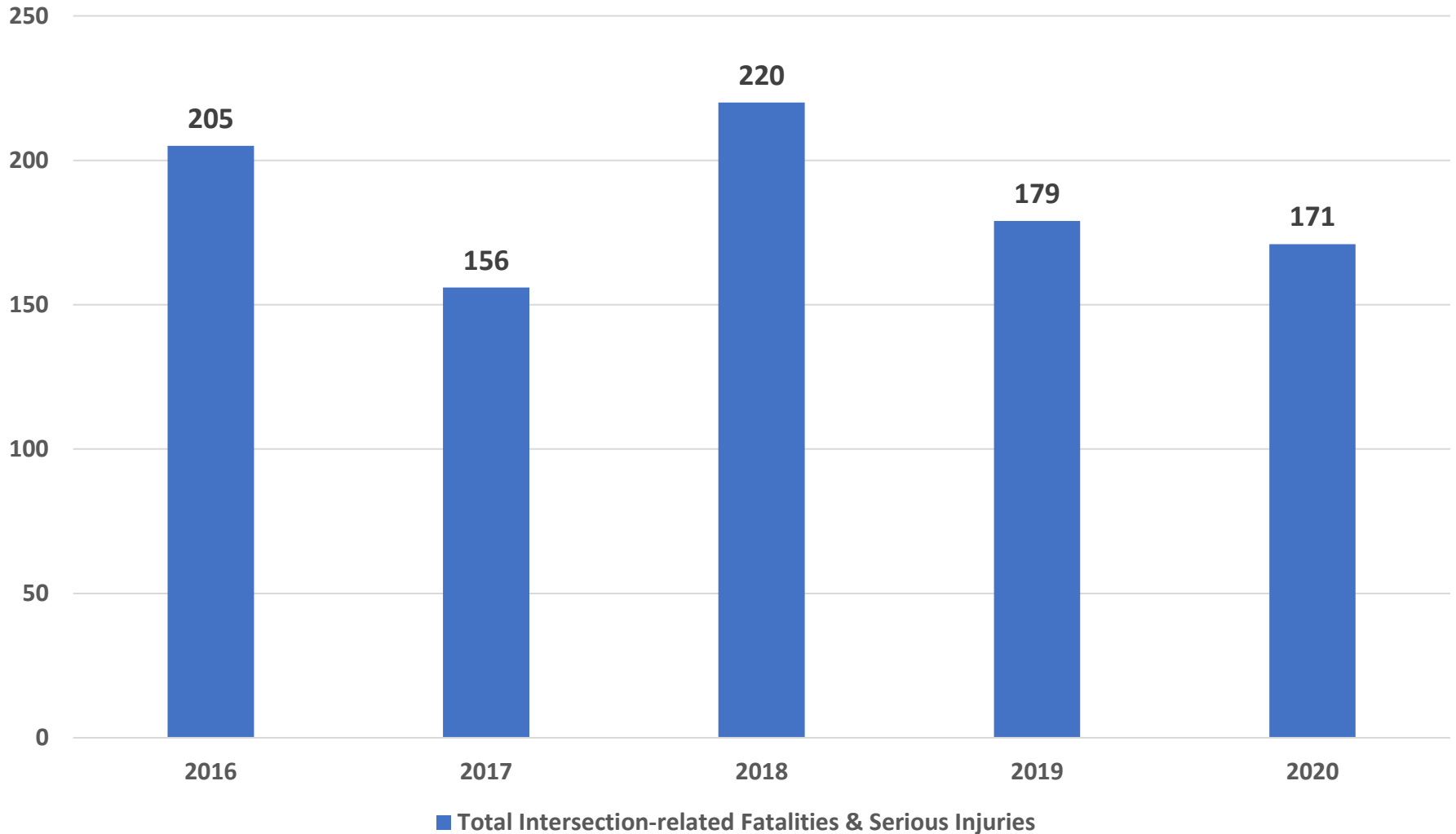
Intersection
Related
Fatalities &
Serious Injuries,
2011-2020

Intersection-related Fatalities & Serious Injuries, 2011-2020



Fatalities and serious injuries continue to decrease over the 10-year period.

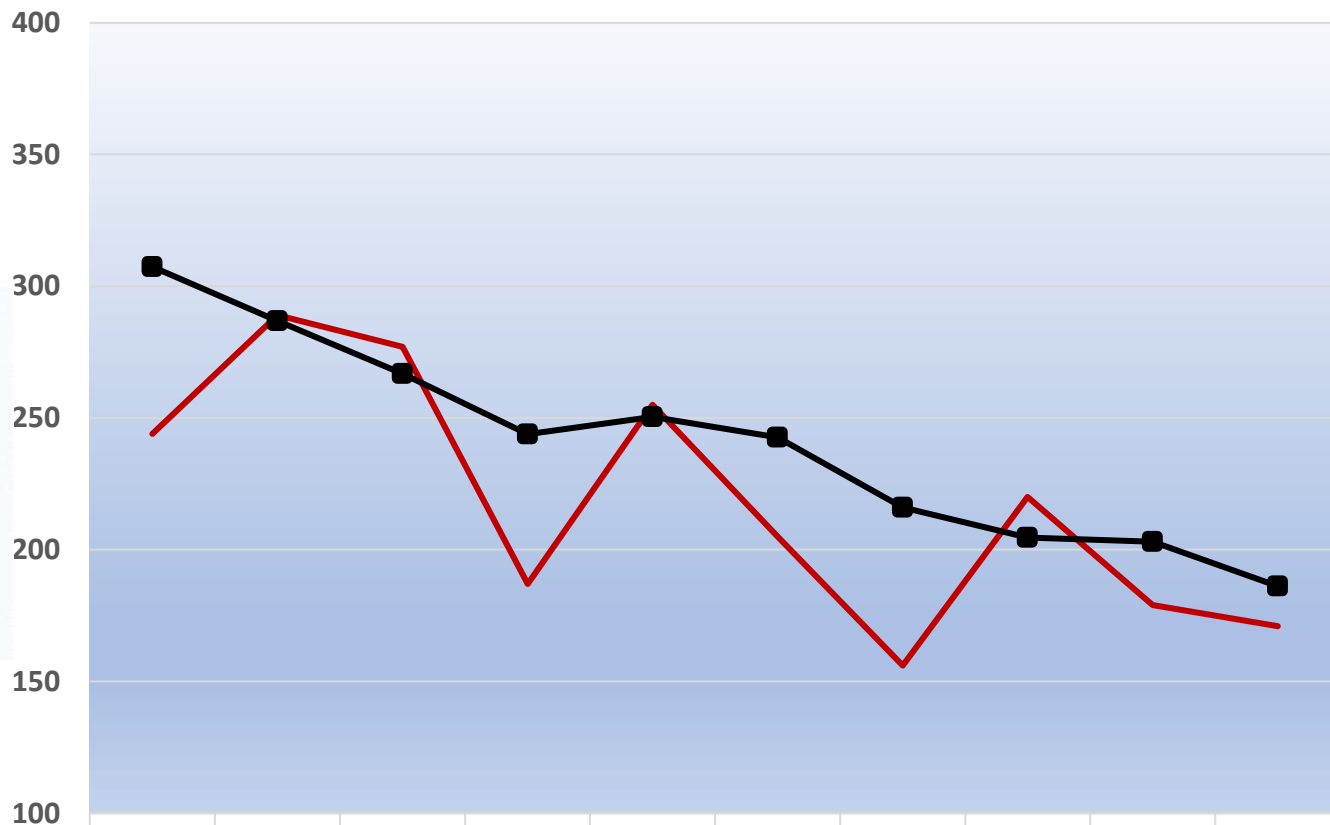
Total Intersection-related Fatalities & Serious Injuries, 2016-2020



The recent 5-year trend indicates a decrease. Notable, the intersection-related fatalities & serious injuries decreased in 2019 & 2020.

Data Retrieved 7/14/2021

Intersection-related Fatalities & Serious Injuries, 2011-2020

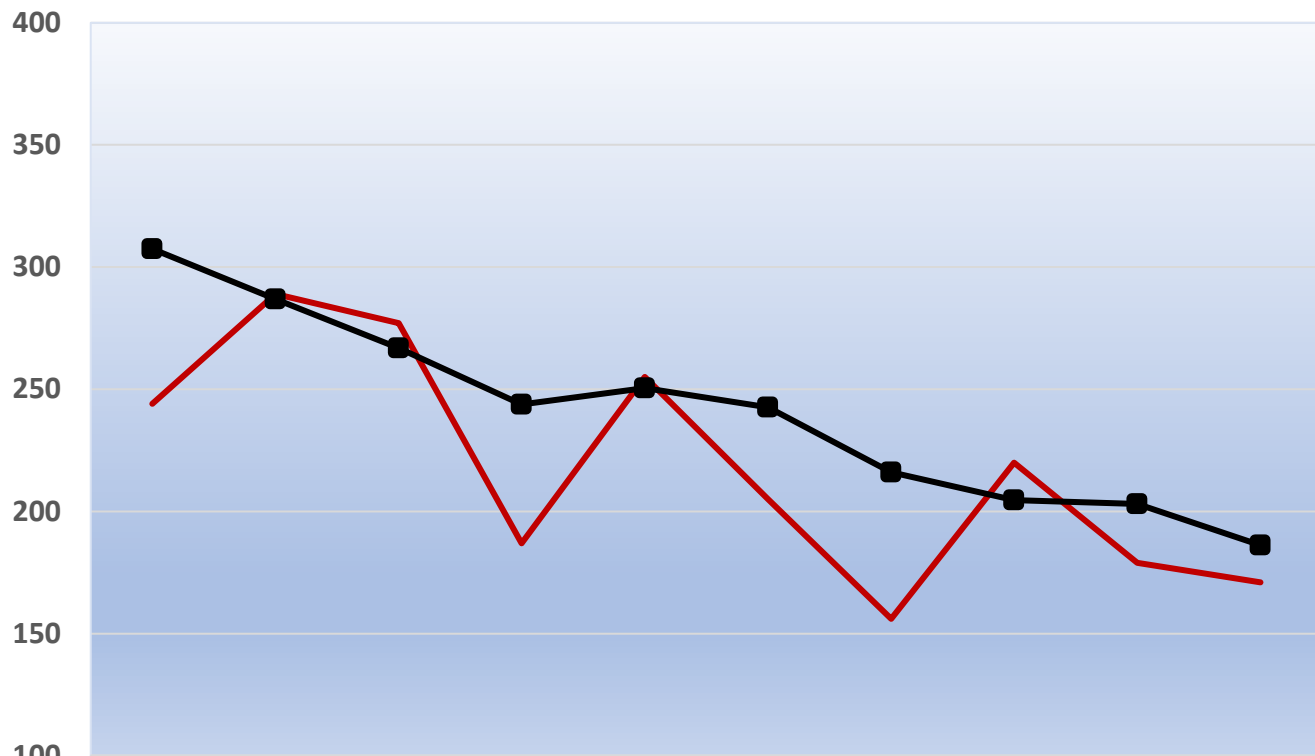


	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
— All Fatalities & Serious Injuries	244	289	277	187	255	205	156	220	179	171
■ 5-Year Average	307	287	267	244	250	243	216	205	203	186
Fatalities	29	17	27	19	30	14	15	21	21	16
Serious Injuries	215	272	250	168	225	191	141	199	158	155

The Intersection-related fatalities & serious injuries were lower in 2020 than the previous two years and below the 5-year average.

Intersection-related Fatalities & Serious Injuries, 2011-2020

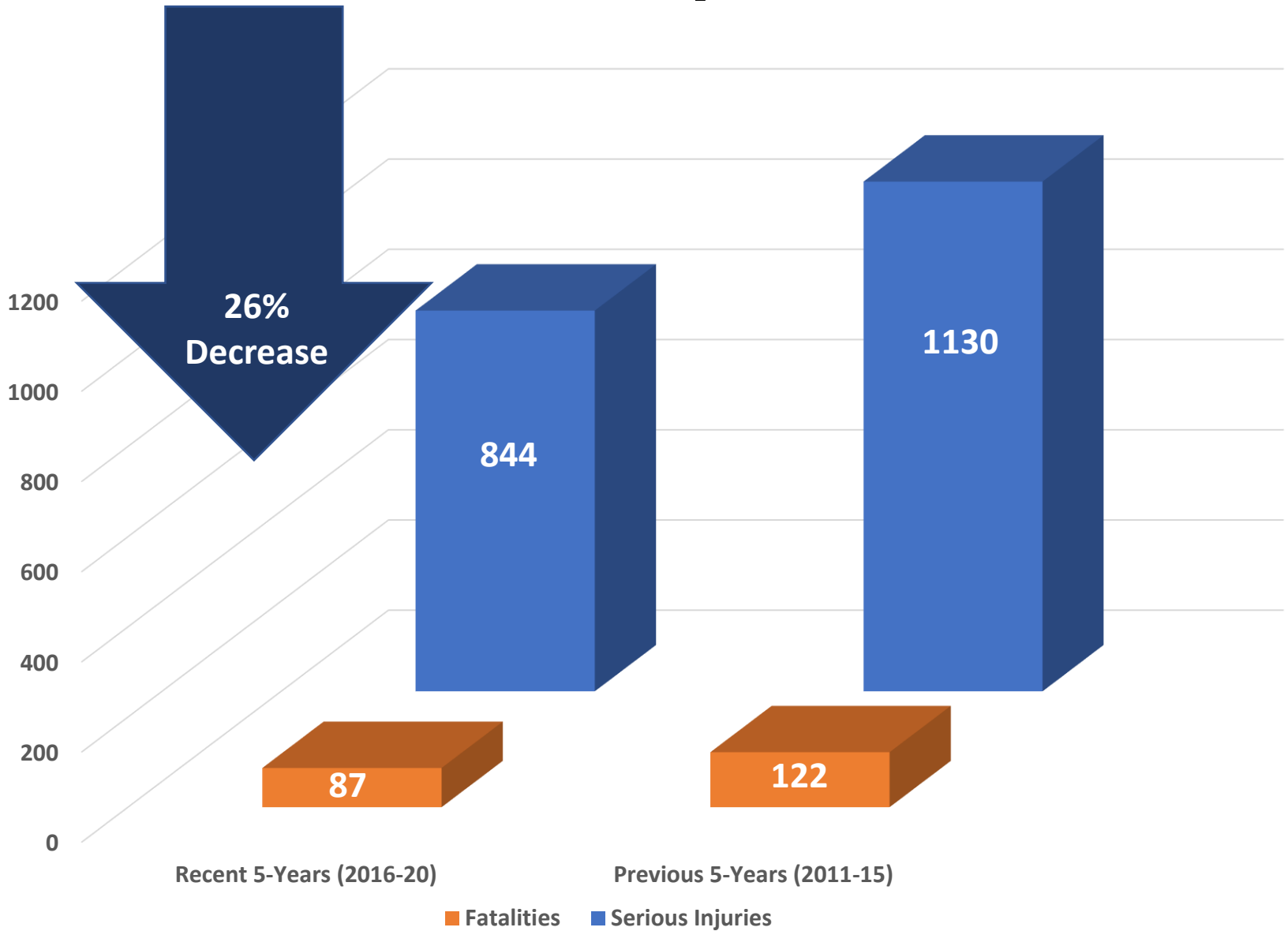
**29%
Decrease
from
2011**



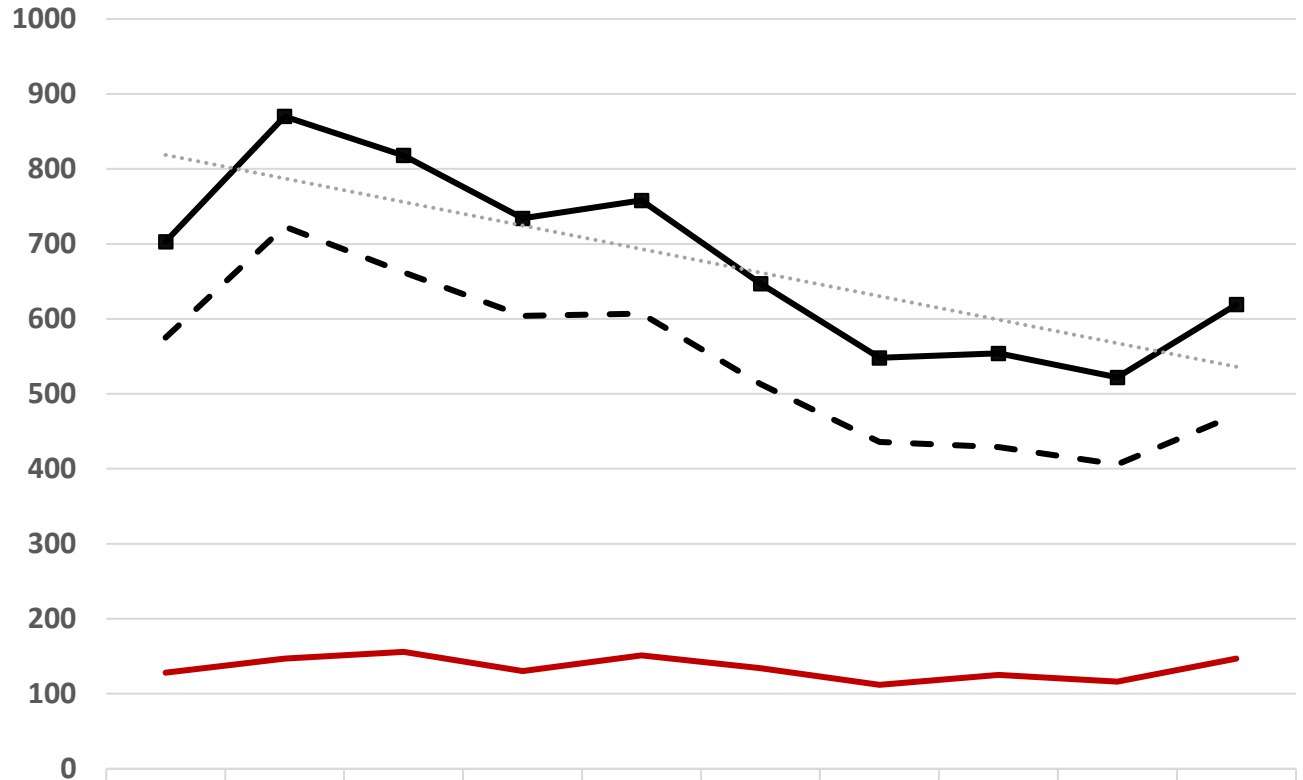
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The Intersection-related fatalities & serious injuries were lower in 2020 than the previous two years and below the 5-year average. Overall, there has been a 29% decrease since 2011.

Intersection-related Fatalities & Serious Injuries, 5-Year Comparison



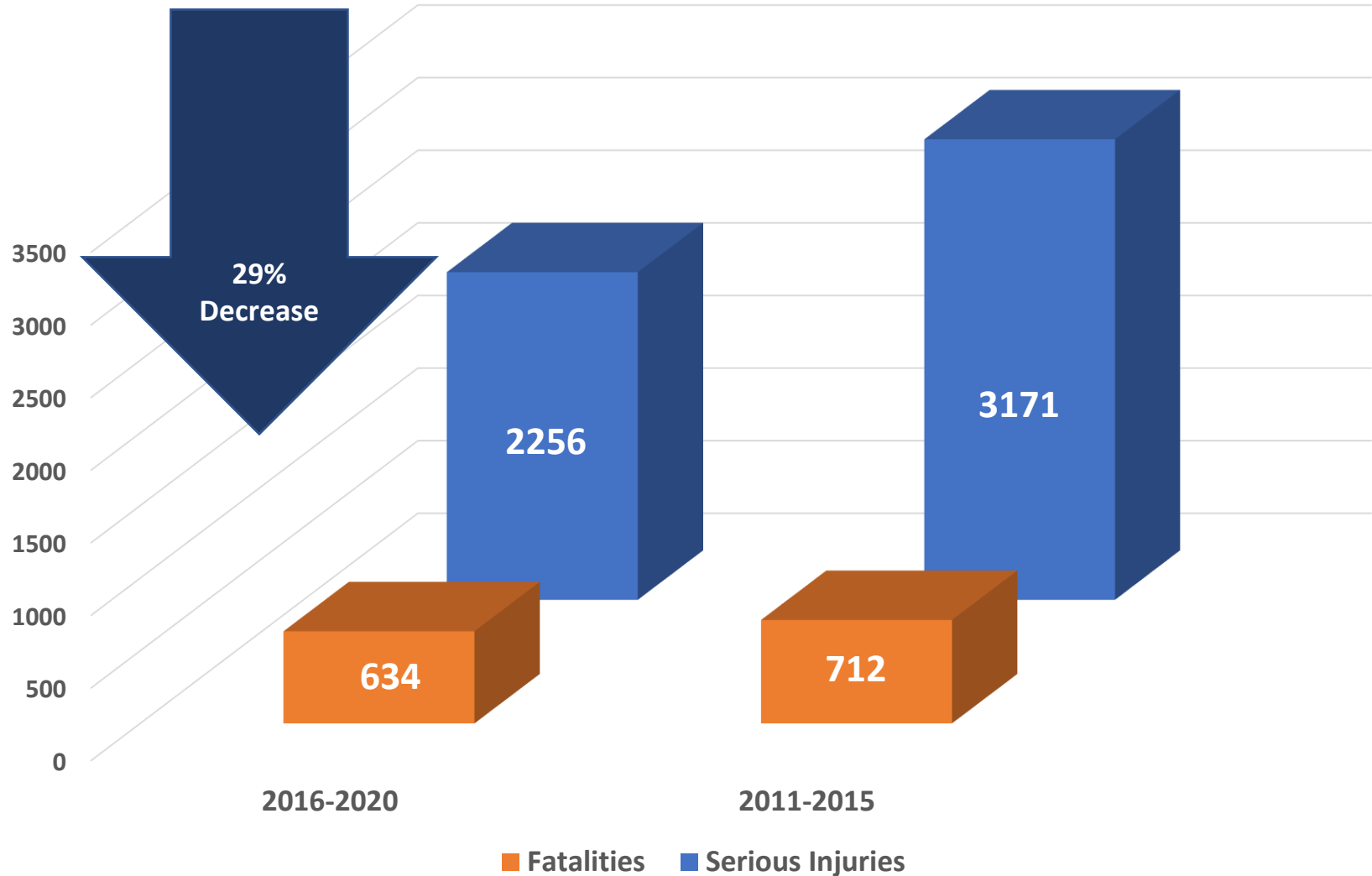
Single Vehicle Fatalities & Serious Injuries, 2011-2020



	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
—■— Total Fatalities & Serious Injuries	703	870	818	734	758	647	548	554	522	619
— Fatality	128	147	156	130	151	134	112	125	116	147
— - Serious Injury	575	723	662	604	607	513	436	429	406	472

The total fatalities & serious injuries mirrors single vehicle serious injuries. 2020 reflects an upturn from the previous 3 years.

Single Vehicle Fatalities & Serious Injuries, 5-Year Comparison



Emphasis Area Strategies



1. Reduce & mitigate roadway departure crashes through data-driven problem identification & use of best practices.

1.1 Continue to Implement the Highway Safety Improvement Program (HSIP)

- MDT Traffic & Safety

1.2 Continue to support and implement Roadway Departure Plan

- MDT Traffic & Safety

1.3 Work Zone Technology to reduce conflicts, roadway departure and rear-end crashes

- MDT Construction



2. Reduce & mitigate speed-related roadway departure/ intersection crashes.



2.1 Continued implementation of Speed Enforcement Campaigns

- MDT Motor Carriers, MHP & MDT Planning**

2.2 Continue to support and implement Intersection Safety Plan

- MDT Traffic & Safety**

2.3 Continue to implement and consider speed management methodologies appropriate for Montana.

- MDT Traffic**



3A. Reduce Roadway departure & intersection crashes through traffic safety education

3.1 AARP Driver Skills Training refresher course covers current rules of the road and defensive driving techniques.

- AARP Driver Safety

3.2 Sustain and continue to provide Share the Road and No-Zone training focusing on operating around large vehicles

- MDT Motor Carriers & OPI

3.3 Continue to sustain and support the implementation of MT D.R.I.V.E skills training

- OPI



3B. Reduce Roadway departure & intersection crashes through traffic safety education



3.4 Continue to sustain and support implementation of the OPI Teen Drivers Education.

- OPI

3.5 Montana Motorcycle Rider Safety (MMRS) Training

- MT Motorcycle Rider Safety & MDT Planning



3.6 Continue to promote Operation Lifesaver- RR safety program

- MT Operation Lifesaver



3.7 Continue to provide and enhance traffic safety information for bicyclist and pedestrians and other non-motorized transportation system users.

- MDT Multimodal Bureau

4. Reduce & mitigate intersection crashes through data driven problem identification & the use of best practices.



4.1 Implement the Railway-Highway Crossings (Section 130) Program. Section 130 program funds are eligible for projects at all public crossings including roadways, bicycle and pedestrian paths.

- MDT Traffic & Safety

4.2 Continue to implement and enhance proven countermeasures such as, but not limited to improving sight distance at intersections and availability of gaps in traffic and assist drivers in judging gaps; access management; traffic signalization, control, operational, and other infrastructure improvements for all transportation system users.

- MDT Traffic & Safety

4.3 Twenty is Plenty speed reduction pilot

- Missoula MPO



5. Continue to improve the accuracy, completeness, integration, timeliness, uniformity, collection & accessibility of data used in traffic safety analysis.



5.1 Enhance and upgrade MDT's Safety Information Management System (SIMS) crash database. Continue to identify, analyze and track HSIP projects that reduce the number of fatal and serious injuries.



- MDT Traffic & Safety / MDT ISD

5.2 Create crash database dashboards for groups including CHSP, Planning Division, etc. This could include other agencies such as MHP (focusing enforcement efforts) and DPHHS (focusing educational efforts).



- MDT Traffic & Safety / MDT ISD



6. Support & increase enforcement of proper road use behaviors by all road users (motorized & non-motorized) identified through crash data.



6.1 Continue to conduct and implement Operation Safe Driver campaigns.

- MDT Motor Carrier Service



6.2 Continue to support the Montana Highway Patrol (MHP) high visibility enforcement STEP and SETT programs with crash maps for distribution to Montana Highway Patrol Districts focusing on speeding, impaired driving, unrestrained vehicle occupants, and distraction in addition to other risky driving behaviors.

- MDT Planning & MHP



7A. Explore & implement best practices for reducing roadway departure, including distracted & fatigued driving, in addition to other behavioral factors.

7.1 Conduct low volume rural roads research project to prioritize and identify areas of need.

- MDT Traffic & Safety

7.2 Research effectiveness of highway safety public education at Montana Motor Vehicle Division and Vehicle Registration Stations by streaming safety videos.

- DOJ - Motor Vehicle Division, MDT & FHWA



7B. Explore & implement best practices for reducing roadway departure, including distracted & fatigued driving, in addition to other behavioral factors.

7.3 Proposed: Research safety evaluation of sinusoidal centerline rumble strips.

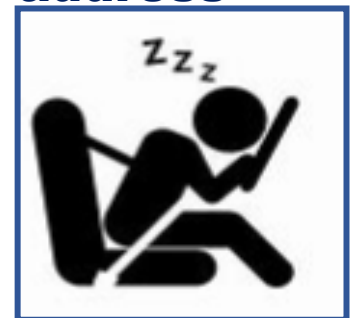
- MDT Traffic & Safety

7.4 Implement findings of New/Novel Signs Study to Support Infrastructure Based Motorcycle Crash Countermeasures Project Stations by streaming safety videos.

- FHWA

7.5 Continue to track and consider implementation of advances in automated vehicle and roadway technologies. As automated vehicle technology advances and is deployed, transportation policy and planning will be critical. Approaches to fully address the needs of the traveling public, businesses, and freight operators will need to be adapted.

- MDT Planning, Motor Carriers and Traffic & Safety



7C. Explore & implement best practices for reducing roadway departure, including distracted & fatigued driving, in addition to other behavioral factors.



7.6 Continue to support awareness of community cell phone ordinances with safety partners

- Safety Stakeholders

7.7 Proposed research effective wildlife fences through better functioning barriers at access roads and jump-outs. Wildlife fences in combination with wildlife crossing structures are the most effective measure to improve human safety through reducing collisions with large mammals, and to provide safe crossing opportunities for wildlife.

- MDT Environmental & Confederated Salish & Kootenai Tribes

Success & Challenges - Stakeholders



Agencies and Groups within this Emphasis Area

- MDT Planning
 - CHSP Team
 - Traffic Safety focused on behavioral choices
- MDT Motor Carrier
 - Share the Road and No-Zone training – primarily with high school driver education



Agencies and Groups within this Emphasis Area

- Montana Highway Patrol – Dept of Justice
 - Speed Enforcement Campaigns
 - Ticketing Aggressive Cars and Trucks Campaign
- MDT Engineering Divisions
 - Speed Studies
 - HSIP Program including Rail Safety Program
 - Work Zone Technology and Smart Signals
- Teen Drivers Education & MT DRIVE Training in Lewistown
 - Office of Public Instruction

Agencies and Groups within this Emphasis Area

- Federal Highway Administration
- AARP (American Association of Retired Persons)
 - AARP Smart Driver Course – focuses on drivers 50 and older
- Operation Lifesaver (Railroad safety program)
- Montana Motorcycle Rider Safety Training

FHWA Proven Safety Countermeasures

OFFICE OF SAFETY

Proven Safety 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 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**



**Yellow Change
Intervals**

FHWA Proven Safety Countermeasures

PEDESTRIANS/BICYCLES



Crosswalk Visibility Enhancements



Bicycle Lanes



Rectangular Rapid Flashing Beacons (RRFB)



Leading Pedestrian Interval



Medians and Pedestrian Refuge Islands in Urban and Suburban Areas



Pedestrian Hybrid Beacons



Road Diets (Roadway Reconfiguration)



Walkways

CROSSCUTTING



Pavement Friction Management



Lighting



Local Road Safety Plans



Road Safety Audit

FHWA-SA-21-082

<https://safety.fhwa.dot.gov/provencountermeasures/>

Pedestrians & Bicyclists

- Incorporated into Roadway Departure and Intersection Emphasis Area



- **Rectangular Rapid Flashing Beacons (RRFB)** are active (user-actuated) or passive (automated detection) amber LEDs that use an irregular flash pattern at mid-block or uncontrolled crossing locations. They significantly increase driver yielding behavior.
- **Leading Pedestrian Intervals (LPIs)** at signalized intersections allow pedestrians to walk, usually 3 to 4 seconds, before vehicles get a green signal to turn left or right. The LPI increases visibility, reduces conflicts and improves yielding to pedestrians.
- **Pedestrian hybrid beacons (PHBs)** are a beneficial intermediate option between RRFBs and a full pedestrian signal. They provide positive stop control in areas without the high pedestrian traffic volumes that typically warrant signal installation.
- **Crosswalk visibility enhancements**, such as crosswalk lighting and enhanced signing and marking, help drivers detect pedestrian—particularly at night.
- **Pedestrian refuge islands** allow pedestrians a safe place to stop at the midpoint of the roadway before crossing the remaining distance. This is particularly helpful for older pedestrians or others with limited mobility.
- **Raised crosswalks** can reduce vehicle speeds.
- **Road Diets** can reduce vehicle speeds and the number of lanes pedestrians cross, and they can create space to add new pedestrian facilities.

Successes & Challenges - Research



MDT's Current Safety Research Projects

- Low Volume Roads
- Motor Vehicle Division Safety Videos
- Sinusoidal Centerline Rumble Strips



MDT's Current Safety Research Projects

- Low Volume Roads

New Methodology

LVR Segments Ranking Scheme

LVR Intersections Ranking Scheme

Purpose: Develop a method for identifying safety improvement on low volume roads without solely relying on crash history.

- Motor Vehicle Division Safety Videos

Purpose: Evaluate the effectiveness of Safety videos shown in Driver License Stations and County Treasurer Offices.



- Sinusoidal Centerline Rumble Strips

Purpose: Investigate the effectiveness of Sinusoidal Centerline Rumble Strips in lowering the number of observed crashes.



Contact Information

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