Nebraska Strategic Highway Safety Plan

November 2023

Guidance 2022-2026

EDUCATION
ENFORCEMENT
ENGINEERING
EMS

TOWARD ZERO DEATHS
NEBRASKA

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My Fellow Nebraskans –

Every five years, NDOT provides a Strategic Highway Safety Plan (SHSP), meant to allow the State and its partners to work together to decrease fatal and serious injury crashes. The 2022-2026 SHSP sets a goal of implementing innovative safety-infrastructure projects as part of a larger safe systems approach of eliminating possibilities for crashes, reducing the probability of a crash, and reducing the severity if a crash occurs.

This SHSP builds on the momentum of previous plans, with critical emphasis areas on increasing seat belt usage and reducing crashes on our roadways due to factors such as lane departures, intersections, impaired driving, and non-motorists (e.g., pedestrians, cyclists).

In an effort to ensure we are serving all Nebraskans, we've added a Vulnerable Road User (VRU) assessment to the SHSP this year. The VRU is focused on the safety of pedestrians and cyclists and identifies critical emphasis areas for NDOT. The plan is data-driven, strategic and designed to serve as a comprehensive framework for making meaningful headway toward Nebraska's safety goals.

Input from stakeholders across the state, paired with both state and federal data, contributed to the wide range of strategies that address both infrastructure and driver behavior concerns. For example, data from the VRU assessment and our safety partners provides us guidance to focus more on safety design features such as high-visibility crosswalk markings and signs, roundabouts and connecting sidewalk gaps, just to name a few.

The plan, per federal regulatory requirements, is also used to improve partnerships and discussions with safety advocacy groups, local communities and law enforcement around informed advocacy and educated safety recommendations for road users of all ages, especially those who are at a higher risk of crashes.

We have a shared responsibility between NDOT as the stewards of our infrastructure, our partners and road users to achieve the goal of zero deaths on Nebraska roadways – it takes a collective, statewide effort made up of personal choices to drive safely every trip, every time.

Always wear your seatbelt,

Vicki Kramer

Director, Nebraska Department of Transportation

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Executive Summary

Zero is the only acceptable number of fatalities on Nebraska roads. Every strategy, every goal, and every statistic in this plan is focused on Nebraska's goal toward zero deaths. Safety is a shared responsibility among road users and road stewards. The Critical Emphasis Areas outlined in the Nebraska Strategic Highway Safety Plan are opportunities to take individual and agency action towards our shared goal of zero deaths on Nebraska roads. We can achieve this goal together.

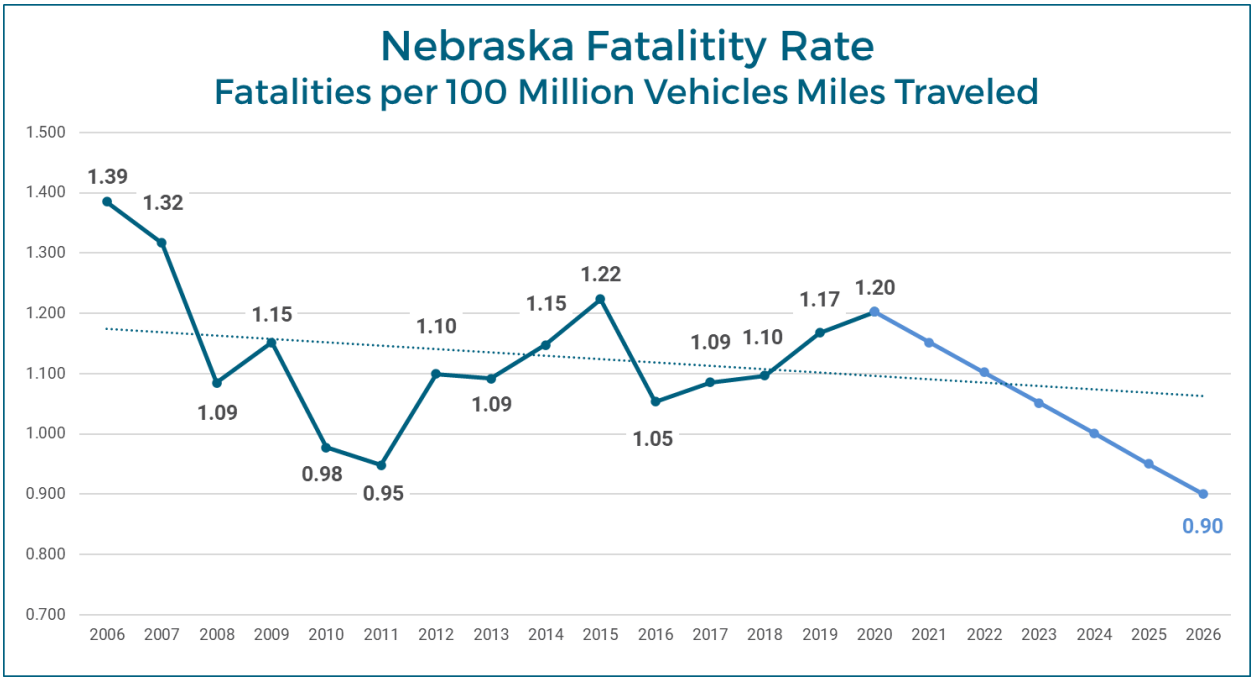
In 2005, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users of 2005 (SAFETEA-LU) required all States to develop Strategic Highway Safety Plans (SHSP). Subsequent transportation plans, Moving Ahead for Progress in the 21st Century Act (MAP-21), Fixing America's Surface Transportation (FAST) Act, and the current Infrastructure Investment and Jobs Act (IIJA) have carried forward this requirement. The Nebraska SHSP for 2022-2026 complies with that requirement and builds on the success of the first three SHSPs. IIJA increased the Highway Safety Improvement Program (HSIP) funding by 35% to an all-time high of $22.2 million for Nebraska in 2026. This new level of HSIP funding is a historic opportunity to implement data-driven systemic safety improvements to reduce fatalities and serious injuries.

This SHSP is presented under the auspices of the Nebraska Interagency Safety Committee (IASC), whose member agencies include the Nebraska Department of Transportation, Nebraska State Patrol, Nebraska Department of Motor Vehicles, Nebraska Department of Health & Human Services, Nebraska Local Technical Assistance Program, League of Nebraska Municipalities, and the Nebraska Association of County Officials. A Vulnerable Road User Assessment was completed in November 2023 and added as an appendix to this plan.

After more than a decade of continuous reductions in roadway deaths and injuries, National Highway Traffic Safety Administration (NHTSA) reported that in 2014 the national fatality rate declined to 1.08 fatalities per 100 million vehicle miles traveled (VMT), the lowest rate since they began collecting fatality data through the Fatality Analysis Reporting System (FARS) in 1975. However, since 2014, fatalities have increased by 19% to 38,824 in 2020, the highest number of annual fatalities since 2007.

Nebraska generally followed these national trends, hitting a historic low of 181 fatalities and a fatality rate of 0.95 fatalities per 100 million VMT in 2011. The Nebraska fatality toll rose to 248 fatalities in 2019, the highest count since 2007. Figure 1 below shows the Nebraska fatality rates since 2006 and a projected trend line to 2026.

Despite impressive improvements in national highway traffic safety since the early 1970's, traffic-related deaths and injuries continue to impose financial, physical, and emotional burdens on the residents of Nebraska. Traffic crashes are still one of the leading causes of death, and the estimated annual economic cost of the 29,418 crashes that occurred during 2020 is almost $4.7 billion dollars.



Nebraska data retrieved from the NDOT.

Figure 1

In review of the outcomes of the first three SHSPs, the IASC has chosen to keep the same fatality goal from the 2017-2021 SHSP. The IASC has adopted a goal to reduce traffic fatalities per 100 million VMT from 1.122 (2016-2020 average fatality rate) to 0.90 fatalities by December 31, 2026. The State's ultimate goal is toward zero deaths.

To align with Nebraska's annual safety performance measures, the IASC introduced two new goals for the 2022-2026 SHSP. Using the ten-year linear trendline, the IASC has adopted a new goal to reduce traffic serious injuries per 100 million VMT from 6.916 (2016-2020 average serious injury rate) to 5.5 serious injuries by December 31, 2026. In support of the longer term outlook of the annual non-motorist safety performance targets, the IASC adopted a new goal to reduce non-motorist fatalities and serious injuries from 127 (2016-2020 average) to 110 fatalities and serious injuries by December 31, 2026. These two new goals will provide a longer term planning vision for supporting all the annual safety performance measures.

The IASC estimates that achieving these new goals would save 138 lives and eliminate 1,181 serious injuries over the next five years. Achieving these goals would save $359 million annually.

Based on the 2021 Safety Stakeholder Survey and 2016-2020 historical crash data, the IASC elected to continue four Critical Emphasis Areas (CEA), modify two CEAs, and add one new CEA for the 2022-2026 SHSP.

Nebraska has made progress toward reducing alcohol impaired driving. However, recently drug impaired driving has been on the rise. The IASC modified the alcohol impaired driving CEA to encompass both alcohol impairment and drug impairment due to the similarities of safety improvement techniques and strategies. The IASC also modified the roadway departures CEA to also include lane departure crashes. These two crash types have similar strategies and safety countermeasures that can reduce lane departure and roadway departure crashes at the same time.

Non-motorist fatalities and serious injuries have been increasing nationally recently. Though Nebraska has not experienced this same trend, the IASC proactively identified the need to directly support improving safety for non-motorists. The creation of a new non-motorist CEA allows for a more direct impact on the annual non-motorist safety performance measure. The Vulnerable Road User Assessment aligns with and expands upon the non-motorist CEA. The CEAs for the 2022-2026 SHSP are:

1. Increasing Seat Belt Usage
2. Reducing Roadway/Lane Departure Crashes
3. Reducing Impaired Driving Crashes
4. Reducing Intersection Crashes
5. Reducing Young Driver Crashes
6. Reducing Older Driver Crashes
7. Reducing Non-Motorist Crashes

In preparation for updating the SHSP for the next five-year period starting in 2021, the IASC reviewed crash data trends from 2016 through 2020 for the six previous CEAs and additional areas of concern. The crash data review included using fatalities, serious injuries (Type A), and visible injuries (Type B) to better reflect crash trends. The additional areas included speed-related crashes, distracted driving crashes, commercial motor vehicle crashes, motorcycle crashes, work zone crashes, and bicycle and pedestrian crashes. Because crash investigators can only code one contributing driving factor per vehicle, it is difficult to capture complete data on distracted driving and excessive speed related crashes. The 2022-2026 SHSP continues to include strategies to address additional areas of concern, and the IASC will continue to monitor crash trends on a yearly basis.

In preparing the 2022-2026 SHSP, the IASC also recognized the importance of safety shareholder input to the success of the plan. Toward this end, the IASC surveyed safety partners, safety advocates, and the general public across the state for their input on what emphasis areas they felt were important to include in the plan. The survey also asked respondents to rate the perceived effectiveness of the 2017-2021 SHSP CEA strategies. The IASC carefully reviewed these recommendations and adjusted CEAs and strategies. This report discusses survey results and analysis in Section 2.

The IASC also included strategies for new advances in safety technology to improve roadway safety including intelligent transportation systems (ITS), such as adaptive control signals, bridge anti-icing spray systems, and connected vehicle technology. In the coming years, the NDOT plans to mainstream and integrate ITS strategies into a growing proportion of roadway construction projects. In support of the annual safety performance measures, the Nebraska Department of Transportation (NDOT) has created a new annual HSIP Implementation Plan. This plan includes and integrates the HSIP and Rail-Highway Crossing Program Expenditures Plan. The expenditures plan was an implementation document for the SHSP. The new implementation plan includes a list of countermeasures and project listings to sustain consistent obligations of HSIP funds to reduce the frequency and severity of crashes on Nebraska roads.

It is important to recognize the achievements of the recently concluded SHSP. In addition to the infrastructure safety projects funded by the HSIP, the NDOT Highway Safety Office funded many of the enforcement and public information and education initiatives through the NHTSA funding.

- The state participated in five national and five state “Click It or Ticket” mobilizations and an additional ten national “Drive Sober or Get Pulled Over” impaired driving crackdowns. Also utilized during this time were saturation patrols, sobriety checkpoints, underage party patrols, and alcohol license compliance checks.
- The NDOT implemented Phase III of an innovative statewide High Risk Rural Roads Program (HRRRP) safety project to provide object markers to counties. More than half of all Nebraska counties participated in this HSIP safety project.

- The NDOT installed over 3,500 miles of rumble stripes/strips to address lane/roadway departure crashes during 2017-2021.
- During 2017-2021, the NDOT safety teams obligated nearly $52 million for over 124 safety projects, including $12 million in statewide HRRRP projects.
- The Nebraska State Patrol (NSP) conducted 2,776 traffic safety programs reaching approximately 424,587 individuals statewide. NSP utilized the new mascot Trooper Buck L. Up, the rollover simulator, the seat belt convincer, and virtual driving simulators to engage and interact with the public.
- Other notable safety projects included Buckle Up Phone Down (BUPD) media campaign, municipality sign inventory pilots, and traffic control device packages for the Traffic Incident Management (TIM) training.

The following is a summary of the highway safety data for the seven CEAs. These figures are using 2016-2020 crash data.

- Fatalities increased from 218 in 2016 to 233 in 2020 (7%), or a fatality rate of 1.2 per 100 million VMT, exceeding the SHSP's overall goal of 0.9 fatalities per 100 million VMT.
- Serious injuries dropped from 1,588 in 2016 to 1,285 in 2020 (19%).
- Seat belt usage rate decreased from 83% in 2016 to 81% in 2020.
- Alcohol/drug impaired fatalities decreased from 94 in 2016 to 80 in 2020 (15%).
- Seat belt citation convictions decreased from 6,976 in 2016 to 2,236 in 2020 (68%).
- Alcohol/drug impaired driving arrests dropped from 7,426 in 2016 to 5,425 in 2020 (27%).
- Youth-involved (ages 16-20) fatal, serious injury, and visible injury crashes were reduced from 1,513 in 2016 to 1,278 in 2020 (16%).
- Older drivers-involved (age 65+) fatal, serious injury, and visible injury crashes decreased 22%, from 976 in 2016 to 766 in 2020.
- Intersection-related fatal, serious injury, and visible injury crashes decreased 23%, from 3,414 in 2016 to 2,344 in 2020.
- Roadway/lane departure fatal, serious injury, and visible injury crashes decreased 2%, from 1,742 in 2016 to 1,712 in 2020.
- Fatal, serious injury, and visible injury crashes involving pedestrians or bicyclists decreased by 36% from 477 in 2016 to 303 in 2020.

The IASC has also identified crash records as an area of emphasis in this SHSP. With a wide variety of entities depending on timely, accurate, consistent, and complete data, the NDOT has completed data system improvements including an upgrade of the current electronic crash reporting system, upgrade and expansion of electronic citations, and the 2021 Traffic Records Assessment. Various NDOT safety committees, as well as the NDOT Highway Safety Office, use crash data to determine where the state will get the best benefit versus cost to identify and evaluate both infrastructure and driver behavior-related projects and activities. NDOT has planned several additional traffic records improvements to occur during this SHSP.

The IASC and a wide variety of safety partners will continue to seek potential safety strategies for new and innovative ways to help achieve the state's overall goals. There are hundreds of potential investment strategies. However, experience suggests that only a few combinations of strategies will be the most effective at achieving the stated fatal and serious injury crash reduction goals.

Additionally, the Nebraska Unicameral passed several highway safety-related pieces of legislation during the 2017-2021 legislation sessions. These legislative bills noted are in Section 1.5.

The final component of the Nebraska SHSP will be to provide guidance on where and how to invest safety funds and resources in order to achieve the State's safety goals and to provide proof that these goals are, in fact, attainable.

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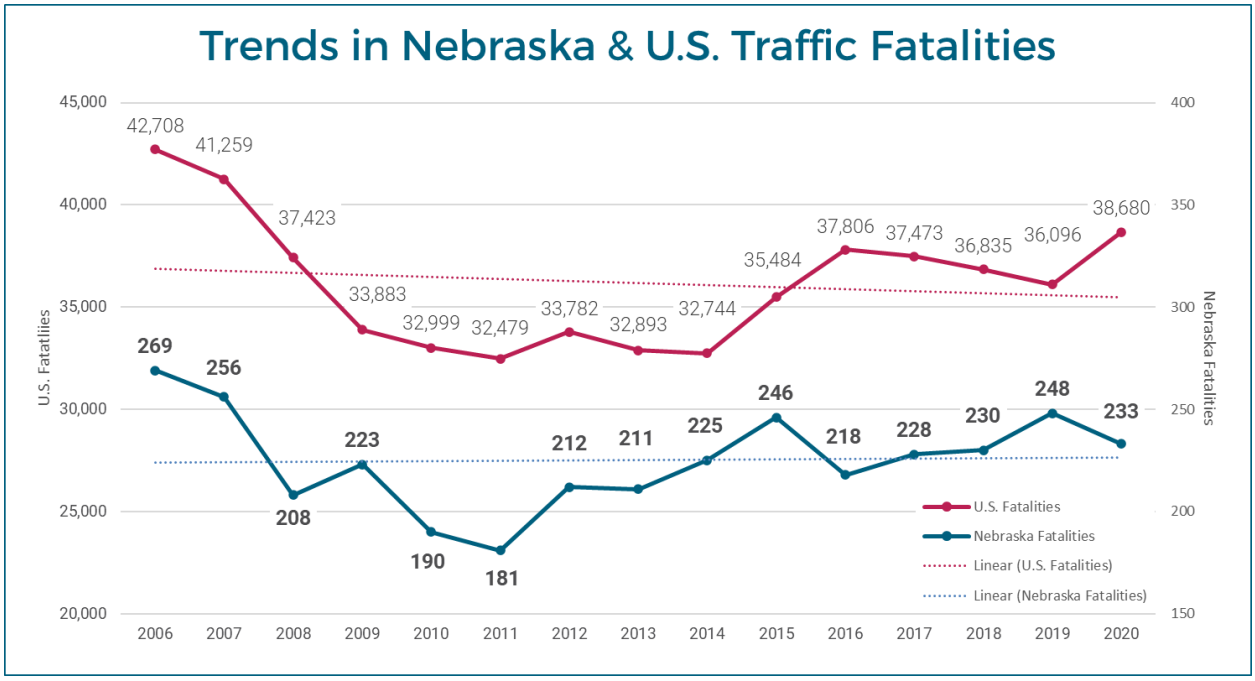
1. Introduction and Background

1.1 Highway Safety Trends at the National Level and in Nebraska



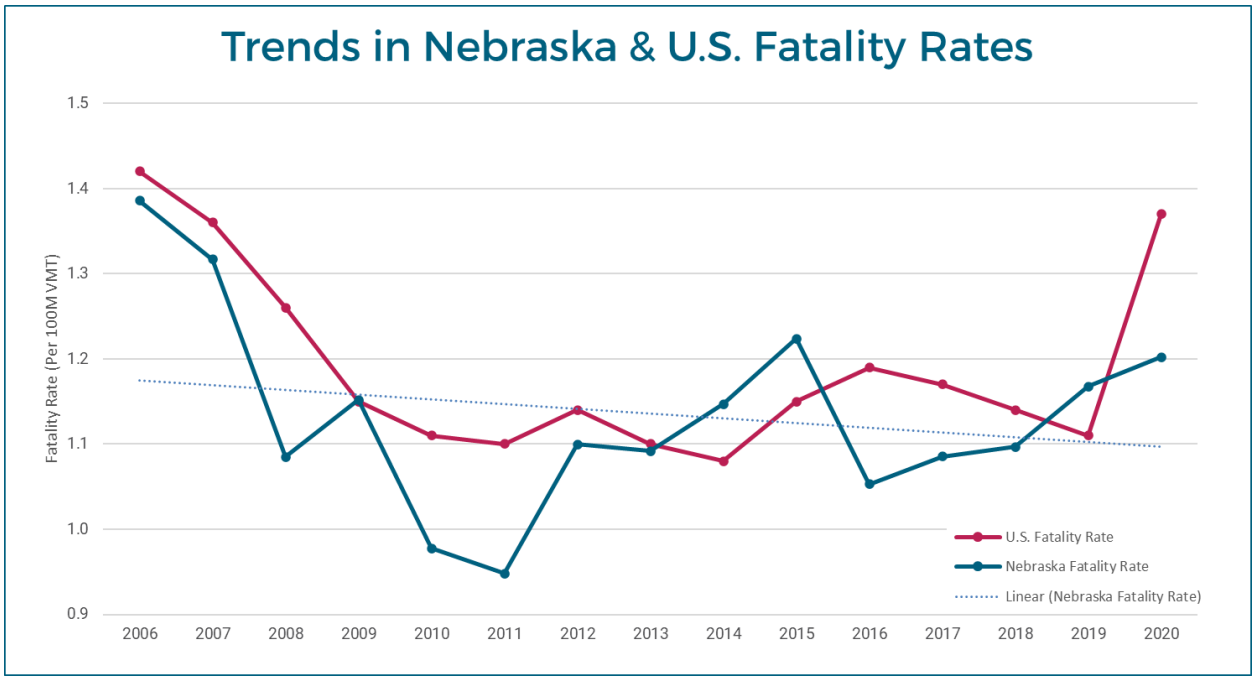
U.S. data retrieved from the NHTSA. Nebraska data retrieved from the NDOT.

Figure 2

From a peak in the 1970s, there have been steady reductions in the number of traffic-related fatalities in the U.S. Nebraska experienced a decrease in the number of traffic fatalities in the late 2000s similar to the national trend as illustrated in Figure 2. By 2011, the state had a historically low fatality total of 181. Since then, there has been an upward trend to a 2019 high of 248, a 37% increase since 2011. A contributing factor to this fatality increase was the steady rise in vehicle miles traveled (VMT) throughout this period. VMT in Nebraska increased from 19.1 million in 2011 to 21.2 million in 2019, a growth of 11%.

Nationally, the number of fatalities has steadily increased from 2011. According to figures from the National Highway Traffic Safety Administration (NHTSA), highway deaths are estimated to have increased to approx. 38,680 in 2020, a 19% percent increase from the historical low of 32,479 in 2011. Due to different traffic patterns in 2020, Americans collectively drove only about 2.83 trillion miles according to FHWA's Traffic Volume Trends, a decrease of 4.7 percent from 2011.

In the past 15 years, the trend in Nebraska has similarly followed what has been occurring nationally, as illustrated in Figure 3. Nebraska realizes the need to expand on current strategies, implement additional strategies, as well as develop new and innovative strategies to reverse the upward trend in Nebraska's fatality rate.



U.S. data retrieved from the NHTSA. Nebraska data retrieved from the NDOT.

Figure 3

1.2 Safety Plan Efforts in Nebraska

Despite impressive improvements in national highway traffic safety since the early 1970's, traffic-related deaths and injuries continue to impose financial, physical, and emotional burdens on the residents of Nebraska. Traffic crashes are still one of the leading causes of death and the estimated annual economic cost of the 29,418 crashes that occurred during 2020 is almost $4.7 billion dollars.

Traffic fatalities in Nebraska fell from a peak of 490 in 1970 to a low of 181 in 2011 but have increased to 248 in 2019. During this time, road travel in Nebraska increased by 121%. National trends prior to 2006 indicated that the rate of reduction in roadway related deaths and injuries had flattened and the number of fatalities had actually risen. This lack of progress in reducing the death toll on our nation's highways led the American Association of State Highway and Traffic Officials (AASHTO) and the Federal Highway Administration (FHWA) to conclude that a new focus on and approach to traffic safety was necessary to address the documented increase in fatal and life changing injury crashes.

The updated AASHTO SHSP, "A Comprehensive Plan to Substantially Reduce Vehicle-Related Fatalities and Injuries on the Nation's Highways" (February 2005), outlined 22 key emphasis areas organized into six plan elements: drivers, special users, vehicles, highways, EMS, and management. These key areas served as a starting point to evaluate State data. Additionally, the National Cooperative Highway Research Program (NCHRP) Report 500, "Guidance for Implementation of the AASHTO SHSP," series of publications and the U.S. Department of Transportation's publication "SHSPs: A Champion's Guide to Saving Lives" provided the basis for developing CEAs for the original 2007-2011 Nebraska SHSP.

These documents encouraged states to develop their own SHSPs based on the following six guiding principles: 1) comprehensive, 2) systematic, 3) integrated, 4) stakeholder involved, 5) data driven, and 6) proactive.

In October 2004, the Nebraska Interagency Safety Committee (IASC), comprised of state, local, and federal agencies with an interest in Nebraska's road safety programs, formed to begin the process of developing the first SHSP, as well as the three subsequent plans.

There are two parts to the Nebraska IASC. The first is the Leadership Committee that meets on an as-needed basis to sponsor and oversee the general direction of the Nebraska SHSP. The Leadership Committee is currently comprised of directors from:

- Nebraska Department of Transportation
- Nebraska Department of Motor Vehicles
- Nebraska Department of Health & Human Services
- Nebraska State Patrol
- Nebraska Association of County Officials
- Nebraska League of Municipalities

The second component of the IASC is the Working Committee (IASWC). The Working Committee meets annually to give guidance to the development of the SHSP and help with making decisions on technical issues. The members of the Working Committee are currently:

- Nebraska Department of Transportation
- Nebraska Department of Motor Vehicles
- Nebraska Department of Health & Human Services, EMS/Trauma
- Nebraska State Patrol
- Nebraska Local Technical Assistance Program
- Federal Highway Administration (federal advisor)
- National Highway Traffic Safety Administration (federal advisor)
- Federal Motor Carrier Safety Administration (federal advisor)

1.3 Nebraska Crash Records System

The Nebraska Department of Transportation (NDOT) maintains a sophisticated crash data system which collects, categorizes, and analyzes crashes on all roads in Nebraska. The state revised this system in 2021 to correspond with many of the data elements described in the Model Minimum Uniform Crash Criteria version 5 (MMUCC), a nationwide standard for crash data. The upgrade includes updating and expanding the investigator's crash report and driver's crash report. Implementation of the MMUCC 5 data elements into the crash database will align NDOT's vehicle crash collection process with the national model, which allows researchers to combine Nebraska's vehicle crash data with the national data. The upgraded investigator crash report collects information about distracted driving, drug impairment, and non-motorist crash circumstances.

In 2017, NDOT released an electronic crash reporting portal for drivers. This electronic crash reporting system will allow drivers to report vehicle crashes via an electronic process and has reduced the number of paper driver's reports.

The Nebraska Crime Commission (NCC) continues to move ahead with implementing electronic citations to various law enforcement agencies. The NSP has completed conversion of law enforcement agencies from the old Electronic Accident Form (EAF) to the Traffic and Crime Software (TraCS). The TraCS reporting system is a law enforcement software suite used to capture and record reports generated by an agency's staff during their day-to-day reporting duties. The NDOT collaborated with NSP to fund and develop a Nebraska TraCS crash reporting module to allow for direct data transmittal between the TraCS reporting system and the state's vehicle crash database. Law enforcement agencies on NDOT's EAF

system were migrated to NSP's TraCS system to consolidate electronic crash report into one state system.

Law enforcement agencies continued to implement electronic citations (E-Citations) software such as TraCS.

Nebraska has maintained a Traffic Records Coordinating Committee (TRCC) since 1994 that identifies and champions traffic records improvements. The TRCC has made major improvements during this time span and has additional projects planned. The TRCC developed the *Nebraska Traffic Safety Information System Strategic Plan*. This Plan is updated annually. The TRCC, along with the NDOT Highway Safety Office (HSO) and other traffic records system data collectors, custodians, operators, and users participated in a scheduled Traffic Records Assessment in 2020. Plans for improving the crash records system include upgrading and expanding electronic submittal of crash reports from law enforcement agencies, upgrading the database systems for the crash records and the Department of Motor Vehicles, and promoting the option for drivers to report crashes electronically.

The NDOT uses a Hazardous Location Analysis (HLA) program for the identification of high crash intersections, sections, and clusters on the state highway system. The formula to identify locations uses crash rate by type and volume of roadway, crash frequency, and crash severity. Although this process excluded local roads, a different procedure is used to analyze local roads. The Nebraska High Risk Rural Roads Program (HRRRP) Team uses local road crash data from all Nebraska counties to determine appropriate local and statewide safety projects.

NDOT developed a crash data query and mapping tool called Nebraska Transportation Information Portal (NTIP). NDOT provides a public version on the NDOT website for the public to search and map crash data. To transition to the predictive safety analysis of the Highway Safety Manual (HSM), NDOT has started implementing the new AASHTOWare Safety Powered By Numetric. The new AASHTOWare Safety software provides empirical bayes predictive analyses capabilities and network screening on the state and local roads that will replace NDOT's HLA tool.

The FHWA provided Roadway Safety Data Program (RSDP) technical assistance to the Nebraska Department of Transportation (NDOT) in 2018 to conduct a RSDP assessment. The RSDP is a FHWA program designed to be a collaborative effort between FHWA and States to support development of robust data-driven safety capabilities. It is intended to help improve the roadway data the State uses to develop their Strategic Highway Safety Plan (SHSP), which supports the State's Highway Safety Improvement Program (HSIP).

1.4 Highway Safety Conferences

To introduce the 2017-2021 SHSP to safety stakeholders, the IASC hosted a Nebraska Highway Safety Summit on March 21, 2017. As with the previous summits, representatives from the 4 E's (engineering, enforcement, education, and emergency medical services) addressed safety efforts and strategies for the five Critical Emphasis Areas identified in the SHSP. This was the state's 7th highway safety summit, with previous summits held in 2001, 2003, 2005, 2007, 2009, and 2012. The summit included speakers introducing the 2017-2021 plan, as well as the critical emphasis areas. The speakers presented successful current and past safety strategies for each of the five CEAs, as well as new strategies for the State to implement to reach the overall SHSP goal.

1.5 Legislation

During the years 2017-2020, the Nebraska Unicameral passed the following new legislative bills impacting highway safety:

- May 2, 2017 — LB 339: Change Nebraska Department of Roads to Nebraska Department of Transportation
- April 4, 2018 — LB 42: Child Safety Restraint Law
- April 17, 2018 — LB 1009: Speed Limit Change
- March 12, 2019 — LB 7: Counterfeit Airbag Prevention
- May 1, 2019 — LB 698: Change Load Provisions And Penalties For CMVs and Commercial Trailers
- August 18, 2020 — LB 944: Felony To Use A CMV With Human Trafficking
- March 17, 2021 — LB 174: Change Crash Reporting Requirements
- May 24, 2021 — LB 271: Adopt 24/7 Sobriety Program
- May 27, 2021 — LB 274: Sale Of To-Go Alcohol, Farmer's Market Tax

1.6 Nebraska Department of Transportation

1.6.1 Highway Safety Improvement Program

As a result of SAFETEA-LU, the NDOT implemented two internal teams, in addition to the long-standing Safety Committee, to develop highway safety projects funded through the HSIP. The Safety Committee reviews safety improvement projects submitted by counties and cities and recommends safety projects for locations identified through the Hazard Location Analysis Program. The Strategic Safety Infrastructure Projects Team reviews major and state-wide projects, such as roundabouts, cable median barriers, and statewide shoulder and centerline rumble strip projects.

Although MAP-21 eliminated the HRRRP funding category, the NDOT continues to maintain an HRRRP team which identifies and reviews projects on those roads that formerly qualified for HRRRP funding. High risk rural roads include those roadways that 1) have a national functional classification of rural Major or rural Minor Collector or 2) rural local roads which:

a. Feature roadway characteristics that are associated with specific crash types include, but not limited to: vertical alignment, horizontal alignment, sight distance, intersections, limited or no shoulders, narrow roadway width, and fixed objects along the roadside, or
b. Have been identified through crash types, field reviews, road safety assessments, or local knowledge and experience.

Projects developed by this team include statewide bridge object markers, horizontal curve signing, and intersection signing.

During 2017-2021, the NDOT safety teams obligated nearly $52 million for over 124 safety projects, including $12 million in statewide HRRRP projects. These projects included:

- Improving safety by modifying intersection geometrics
- Resurfacing bridges and curves with High Friction Surface Treatment
- Extending culverts to remove guardrail
- Installing countdown pedestrian signals and flashing yellow arrow (FYA) signal heads
- Building roundabouts at high crash intersections
- Restriping highways with more durable and wider marking materials

- Installing centerline, edgeline, and shoulder rumble strips on two-lane highways
- Providing flexible object markers on county road bridges
- Upgrading horizontal curve signing
- Install cable barrier in the median of freeways and rural interstates
- Constructing Restricted Crossing U-Turn (RCUT) intersections

In most cases, evaluations of safety projects require an economic analysis to determine whether or not a project was cost-effective. The NDOT uses the benefit cost (b/c) analysis technique, in which the equivalent uniform annual benefits derived from the project, usually from crash reduction, are compared with the equivalent uniform annual costs. A project with a benefit cost ratio exceeding 5.0 would be considered cost-effective, with results larger than 5.0 indicating even higher degrees of success.

The following are three examples of successful infrastructure projects that reduced crashes.

Lincoln – Intersection of S. Coddington Ave. & W. Van Dorn St. – This two-way stop-controlled intersection of S. Coddington Ave and W. Van Dorn St. is located in west Lincoln. S. Coddington Ave was the stop controlled approach with dual stop signs, dual bouncing red flashing beacons, and a supplemental "CROSS TRAFFIC DOES NOT STOP" sign mounted below. This location experienced a pattern of right-angle crashes involving vehicles on S. Coddington Ave failing to yield or running the stop sign. The safety project converted the intersection to a single lane roundabout to reduce the right-angle crashes. The project also included adding a five-foot wide sidewalk and ten-foot wide bikeway around the roundabout to accommodate future pedestrian traffic and trail expansions in the area. 23 crashes resulting in 8 injuries occurred at the intersection in the three years before the roundabout was constructed. Only 4 crashes and no injuries occurred afterwards. The benefit-cost ratio for the project was 4.82.

Statewide – 28' Top Rural Highways – A before-after review was conducted of two-lane rural highway projects that added 2' surface shoulder to make a 28' top roadway surface. The analysis showed that increasing the surface shoulder width from 0' to 2' reduced roadway departure crashes by 18%. The 28' top roads also experienced 31% fewer fatal and serious injury crashes. Benefit cost ratios were analyzed based on observed crashes for various traffic volumes. The analysis showed a benefit cost of over 3.5 for widening two-lane 24' roadway to 28' top if the traffic volume is at least 1,000 vehicles per day. This analysis led to a NDOT Roadway Design policy change to construct 28' top surface for all two-lane rural highways with at least 1,000 vehicles per day.

Platte County – Intersection of US-81 & N-91 – This two-way stop controlled intersection of US-81 & N-91 is located east of Humphrey. US-81 is four-lanes, and N-91 was the stop controlled two-lane approach. This location experienced a pattern of right-angle crashes involving vehicles on N-91 failing to yield during left-turns on to US-81. The safety project converted the intersection to a Restricted Crossing U-Turn (RCUT) intersection to reduce the right-angle crashes. This was the first RCUT constructed in Nebraska. 24 crashes resulting in 41 injuries occurred at the intersection in the five years before the RCUT was constructed. Only 1 crash and no injuries occurred in the two years afterwards.

In 2014, the NDOT, in conjunction with the multi-agency State Traffic Incident Management (TIM) Program Implementation Committee, implemented an HSIP project to provide first responders with quality training and the proper tools to clear roads faster and safer during traffic incidents. The traveling public also benefits by first responders providing a consistent statewide approach that meets driver expectations. The training course and device packages are available to fire/EMS departments, law enforcement, emergency management, and public works departments providing vital services to the citizens of Nebraska. Organizations with six members attending a four-hour Strategic Highway Research

Program TIM training course receive a $600 device package that includes two roll-up advance warning signs with stands; five collapsible traffic cones; and six Class 2 safety vests.

Nebraska was one of five initial states that elected to "flex" up to 10% of their HSIP funding as allowed by the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). In 2012, MAP-21, the Moving Ahead for Progress in the 21st Century Act, eliminated the flex option. However, the Act allowed states to use HSIP funding for non-infrastructure safety projects. At that time, the NDOT elected to budget $1 million per fiscal year for non-infrastructure safety projects.

Between 2017 and 2021, the NDOT Highway Safety Office obligated over $25 million for an average of 31 highway safety projects per year addressing the driver behavior CEAs of occupant restraint, impaired driving, older drivers, and younger drivers. The NDOT HSO participated in funding national and state "Click It or Ticket" mobilizations adding hours of overtime enforcement operations emphasizing seat belt and child restraint law compliance. NDOT also approved grants for "You Drink & Drive. You Lose." impaired driving crackdowns that utilized saturation patrols, sobriety checkpoints, underage party patrols, and alcohol license compliance checks to address alcohol-impaired driving.

Between 2016 and 2021, the Fixing America's Surface Transportation (FAST) Act did not allow HSIP funding for behavioral-type projects. The passage of the Infrastructure Investment and Jobs Act (IIJA) provides the option to "flex" up to 10% of their HSIP funds for non-infrastructure activities and behavioral safety projects, such as educational campaigns about traffic safety and enforcement activities.

1.6.2 Rural Roads

The NDOT has taken a unique approach in implementing the HRRRP by partnering with the Nebraska Local Technical Assistance Program (LTAP) and the Nebraska Highway Superintendents Association – an affiliate of the Nebraska Association of County Officials (NACO), as well as the FHWA, Nebraska Division. Representatives from LTAP and NACO meet quarterly with NDOT staff and an FHWA advisor to review crash data, develop safety projects, and examine project proposals from counties. Face-to-face communication has helped members understand the challenges and frustrations from each entity's perspective in addressing mutual safety concerns.

During the 2017-2021 timeframe, the HRRRP team implemented a variety of statewide projects, in addition to individual county projects, that have benefited a large majority of the state's 93 counties. These projects included:

- County bridge and culvert object markers
- Horizontal curve signing
- Intersection signing
- Railroad advance warning signs and posts
- Railroad crossing paved highway pavement markings
- Local roads safety plans
- Road closure barricade training and kits
- Traffic flagging training and kits
- Surface shoulder widening
- Intersection improvements

Although the FAST Act eliminated separate funding for rural roads, the HRRRP team continues to meet to identify and implement safety projects in rural areas. With counties often working on very limited budgets, these projects provide counties with the necessary tools and equipment to keep rural roadways safer for the traveling public. Some of the above-listed projects, such as the horizontal curve signing project, have had multiple phases in order to meet the needs of counties and will continue as a priority under the 2022-2026 SHSP.

1.6.3 Traffic Records

Under the authority and direction of the Nebraska Governor, the Governor's Highway Safety Representative (the Director of the Nebraska Department of Transportation) established a Nebraska Traffic Records Coordinating Committee (TRCC). This is an ad hoc group of key multi-disciplinary Nebraska highway safety and traffic records system data collectors, operators, and users that have authority with respect to Nebraska highway safety data and traffic records systems. This includes responsibility for technology to keep such systems current, TRCC membership, the TRCC Coordinator, and changes in Nebraska's multi-year Strategic Traffic Record System Plan.

The NDOT scheduled a NHTSA Traffic Records Assessment in 2021. The NHTSA concluded the assessment in June 2021.

1.6.4 Safety Technology

The IASC also recognizes the importance of advances in the safety technology to improve roadway safety. During the 2017-2021 time frame, the NDOT implemented a variety of intelligent transportation system (ITS) projects including Dynamic Message Signs (DMS), adaptive control signals, bridge anti-icing spray systems, and connected vehicle technology. Other notable achievements in this area include:

- Creation of a Statewide Operation Center for active traffic management
- Installation of automated ramp closure gates along I-80 from Omaha to Wyoming
- Installation of fiber optics in the Lincoln area of I-80 to improve communications to ITS devices
- Expansion of camera locations available on the NDOT 511 system website to allow travelers to view current road conditions
- Statewide replacement and expansion of DMS sites with hi resolution messaging to improve visibility of messages
- Friday safety messages on DMS signs across the state with short, easy-to-read messages pertaining to highway safety

1.6.5 Active Transportation Committee

In an effort to coordinate and improve active transportation in the state of Nebraska, the Nebraska Department of Transportation (NDOT) established the Active Transportation Committee (ATC) in 2019. The ATC is comprised of NDOT personnel from various divisions, the districts, and various external partners. These external partners include representatives from Bike Walk Nebraska, the Nebraska Health and Human Services (NHHS), the Nebraska Game and Parks Commission, the Federal Highway Administration (FHWA), the American Association of Retired People (AARP), the Metropolitan Area Planning Agency (MAPA – Omaha Metro MPO), and the Lincoln MPO. The ATC meets on an ad hoc basis to assist and advise Nebraska DOT on issues related to active transportation facilities, methods, safety, and policies to improve the mobility and quality of life for all Nebraskans.

1.7 Department of Motor Vehicles

The Nebraska Department of Motor Vehicles (DMV) is charged with the responsibility for the regulation, enforcement, and education of motor vehicle operators and vehicle requirements. The DMV ensures that licensed Nebraska drivers meet the eligibility requirements for operating a motor vehicle and those vehicles are properly titled and registered. In addition to verifying identification and testing for all types

of permits and operator licenses, the Driver Licensing Division provides oversight of driver training schools (adults 18 and over), driver safety courses (teen drivers), and the Motorcycle Safety Program (motorcycle operators). The division also certifies Commercial Driver's License (CDL) Third Party Examiners who administer CDL skills tests to applicants.

- Beginning in 2019, the DMV began the process of upgrading the driver licensing issuance and knowledge test systems to improve DMV efficiencies and services and expand functions and capabilities. The skills test system upgrade will be completed in 2022.
- The DMV moved to the Rider Skill Test (RST) for two and three-wheeled motorcycles in 2019. Tests were developed by the Motorcycle Safety Foundation to assist examiners in conducting fair, accurate, and objective evaluations of rider performance prior to obtaining a Class M (motorcycle) license or endorsement.
- Nebraska State Statute 60-4,118 allows the Director, when requested by a law enforcement officer, physician, or other individual concerned about a license holder's capability to operate a motor vehicle safely, to require the license holder to retest with the DMV. From January 1, 2017 – October 31, 2021, 4,579 individuals were asked to retest. 3,727 did not appear for retest, could not meet minimum medical and vision requirements, or failed the written or drive tests; and their licenses were cancelled. This equates to 81% of those asked to retest.
- The Nebraska Driver's Manual is updated each year. Emphasis in recent years has been on updating road signage and markings. Additional information was included on driving a roundabout.
- Electronic drive test tablets were deployed to all Commercial Driver's License (CDL) Third Party Examiners in 2017. Third Party Examiners use the tablets to score CDL skills tests. The tablets ensure that proper vehicles are used for testing and calculate whether individuals pass or fail the tests. The GPS feature ensures that Third Party Examiners are following approved drive test routes.
- The DMV Legal Division has been working with the Nebraska Crime Commission to get Administrative License Revocation (ALR) sworn reports of arrests related to DUI in an electronic format. This will allow officers to swipe the license after an arrest to enter basic information and allow various forms to be filled out from a single entry of information so that officers do not have to spend time filling various forms out by hand or entering the same information on multiple forms. This will also include CDL holders who are arrested for being over 0.04 Blood Alcohol Concentration (BAC) or refuse a test while driving a commercial motor vehicle.
- On October 15, 2019, DMV deployed a modernized vehicle title and registration system on time and on budget. The windows-based server solution replaced a 27-year old system with distributed processing architecture utilizing 95 separate as400 and mainframe databases. The modernized system has expanded online services to the public, organizations owning fleets of vehicles, and licensed dealers. The system has also delivered a number of other efficiencies, such as automating manual processes, and reducing the opportunity for errors. In addition, it has delivered a number of enhancements to improve fraud prevention and detection.

1.8 Nebraska State Patrol – Enforcement

The Nebraska State Patrol (NSP) regularly participates in national mobilizations designed to reduce highway traffic fatalities including the "Click It or Ticket" mobilizations and "You Drink & Drive. You Lose" impaired driving crackdowns. These mobilizations/crackdowns are scheduled during the year's busiest travel times which unfortunately equates to increased chances for vehicle crashes. In 2021, over 163,632

patrolling hours were devoted to routine patrolling along with mobilizations and safety campaigns on Nebraska roadways. This resulted in over 17,322 speeding citations, 723 restraint violations, 1,366 Driving While Impaired citations and 290 Minor in Possession of Alcohol citations.

Throughout the year the NSP prioritizes educating individuals on the importance of practicing safe driving habits in order to save lives and reduce injuries as a result of motor vehicle crashes. Approximately 2,776 traffic safety programs are facilitated to approximately 424,587 individuals statewide. Utilizing innovative resources such as the Patrol's mascot Trooper Buck L. Up, rollover simulators, seatbelt convincers, and virtual driving simulators enhance the agency's ability to engage and interact with the public.

In addition, in June of 2021 NSP consolidated five different locations into one 85,000 square foot facility by moving into a new building located at 4600 Innovation Drive in Lincoln. This has led to many divisions from Uniform Patrol, Carrier Enforcement, Dispatch to Grants, Accounting and various other support divisions enhancing daily communication, organization, and cooperation. NSP will utilize this teamwork to further enhance its capabilities in the area of highway safety.

1.9 State Patrol – Carrier Enforcement

The NSP Carrier Enforcement Division participated in 19 national commercial vehicle safety initiatives from 2017-2021 under the coordination of the Commercial Vehicle Safety Alliance and the Federal Motor Carrier Safety Administration. In the spring of each year, Operation Air Brake targets large commercial vehicles equipped with air brakes. In this annual single day event, 767 commercial vehicles were checked, with 197 vehicles (25%) being taken out of service. The summer safety initiative is focused on all commercial vehicles, again targeting brake components. Between 2017 and 2021, more than 1,952 commercial vehicles were checked, and 271 vehicles (19%) were taken out of service for defects related to brake system components. The annual fall enforcement effort is focused on drivers of commercial vehicles, and compliance with federal regulations and state law. Over the five-year period from 2017-2021, 1,537 drivers were stopped and checked with violations ranging from logbook violations to CDL requirements. In total, more than 4,256 drivers were contacted resulting in 1,020 citations issued. 197 drivers were identified for non-compliance with Federal Regulations and state law and were put out of service as a result.

The Carrier Enforcement Division organizes an annual statewide safety initiative, Metropolitan Aggressive and Prevention Selective (MAPS), which targets areas within the state which exhibit statistically high crash numbers involving commercial vehicles. At least 14 events are conducted each year. Between 2017 and 2021, approximately 1,895 vehicles were inspected. Of those, 778 (41%) were placed out of service due to safety violations. Additionally, more than 135 drivers (7%) were placed out of service, largely due to driver's license violations.

1.10 Department of Health & Human Services – Emergency Medical Services

In the 2016-2021 timeframe, the DHHS Office of Emergency Health Systems (OEHS) Program participated in following activities:

Traffic Information Management (TIM) training: The DHHS OEHS Program participated in this program by providing course information and contact information to the emergency medical services in the state and participated in planning meetings to incorporate better participation by EMS providers.

Emergency Vehicle Operations Courses: Provided funding for EMS Services and providers to bring host emergency vehicle operation training to include didactic and hands-on familiarity with what is involved

while operating an emergency vehicle. This information included but is not limited to liability, stress, and uniqueness of operating an emergency vehicle. During 2016-2021, 30 classes were held training over 500 in Emergency Vehicle Operator Course.

The National Emergency Medical Services Information System (NEMSIS) Version 3.4 (V3.4) is the data reporting standard for EMS. NEMSIS V3 provides a uniform EMS dataset broken into two major sections. The sections are Service Demographics and Emergency Medical Services. All incident and patient care information are standardized including crash and injury information. Of particular focus are the "Automated Collision Notification Data" and "Model Minimum Uniform Crash Criteria (MMUCC)". The Electronic Nebraska Ambulance Rescue Service Information System, a data collection system, is NEMSIS-compliant and included in the Nebraska EMS Data Dictionary. OEHS is in the process of developing an implementation plan for transitioning to NEMSIS Version 3.5 with a target time frame of quarter 1, 2023.

OEHS has been evaluating and implementing performance measures with the assistance of the Nebraska Board of Emergency Medical Services and other stakeholders. The goal is being developed with the ultimate goal of EMS providing effective, high-quality healthcare to patients at a statewide level. By developing performance measures, the initiative should help EMS providers, executives, and regulators recognize if they are achieving those goals. Nebraska will be evaluating these performance measures to determine which measure will best measure the quality and performance of EMS delivery in Nebraska.

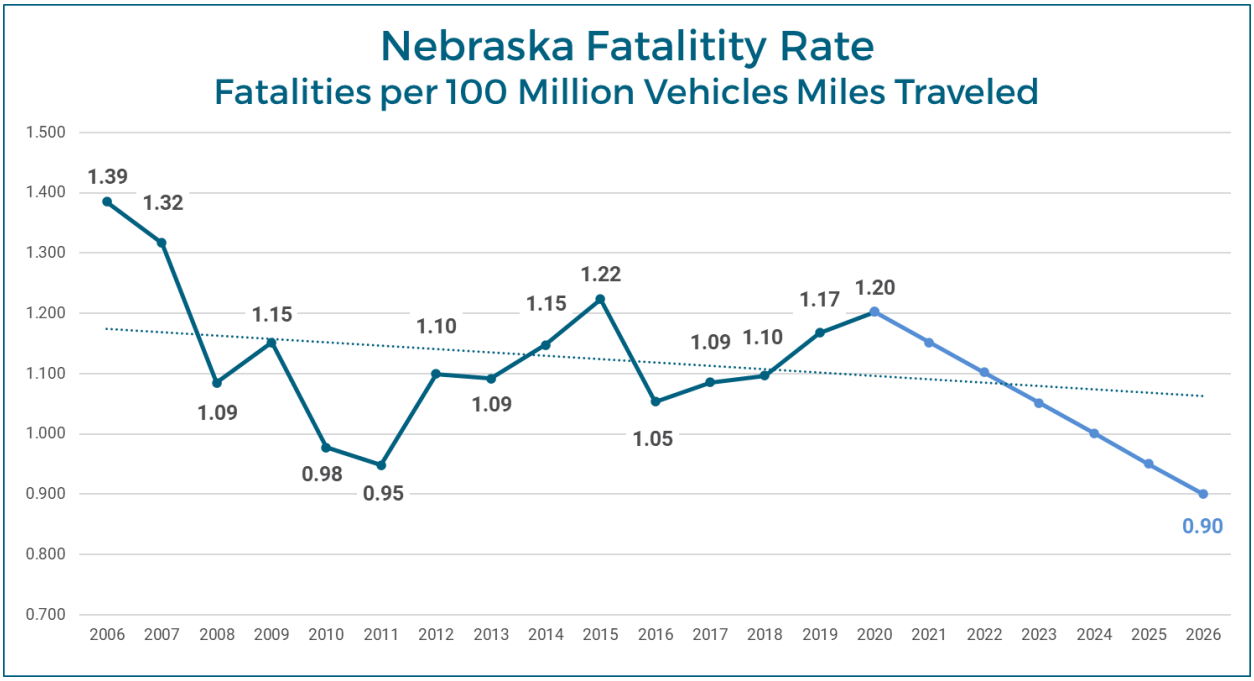
Participation in conferences provides the OEHS EMS and Trauma Programs the ability to remain current and plan for future needs of EMS incident and patient care documentation. Annually, NEMSIS and ImageTrend, the software vendor for Nebraska, hosts conferences that program staff attend to ensure Nebraska remains current with the software and national standards. This ongoing education maintains the integrity of the database, reporting standards, crash data, and other interested programs for EMS data.

2. 2022-2026 SHSP

2.1 2022-2026 SHSP Goals

In review of the outcomes of the first three SHSPs, the IASC has chosen to keep the same fatality goal from the 2017-2021 SHSP. The IASC has adopted a goal to reduce traffic fatalities per 100 million VMT from 1.122 (2016-2020 average fatality rate) to 0.90 fatalities by December 31, 2026. The State's ultimate goal is toward zero deaths.

The IASC estimates that achieving these new goals would save 138 lives over the next five years.



Nebraska data retrieved from the NDOT.

Figure 4

To align with Nebraska's annual safety performance measures, the IASC introduced two new goals for the 2022-2026 SHSP. Using the ten-year linear trendline, the IASC has adopted a new goal to reduce traffic serious injuries per 100 million VMT from 6.916 (2016-2020 average serious injury rate) to 5.5 serious injuries by December 31, 2026. In support of the longer term outlook of the annual non-motorist safety performance targets, the IASC adopted a new goal to reduce non-motorist fatalities and serious injuries from 127 (2016-2020 average) to 110 fatalities and serious injuries by December 31, 2026. These two new goals will provide a longer term planning vision for supporting all the annual safety performance measures.

The IASC estimates that achieving these new goals would eliminate 1,181 serious injuries over the next five years.

2.2 Process for Updating the 2022-2026 SHSP

In updating the SHSP for the next five-year period starting in 2021, the IASWC reviewed crash data trends from 2016 through 2020 for the six previous CEAs. In addition, the group reviews other areas of concern as shown in Figure 5 below. The committee continued to use fatality, serious injury (Type A), and visible injury (Type B) crash data for their analysis to better reflect crash trends.

Because crash investigators can only code one driver-contributing factor for each vehicle in a crash, it is difficult to capture complete data on distracted driving and speed-related crashes. NDOT implemented a new MMUCC Version 5 compliant crash report in 2021 to improve the reliability and analysis of this data for future SHSP updates.

The IASWC then prepared a summary of fatal, serious injury, and visible injury crashes (2016-2020) to determine if the current CEAs were appropriate, or if crash data supported a change in the six previous CEAs. Based on the 2021 Safety Stakeholder Survey and 2016-2020 historical crash data, the IASC elected to continue four CEAs, modify of two CEAs, and add one new CEA for the 2022-2026 SHSP.

Nebraska has made continuous progress toward reducing alcohol impaired driving. However, recently drug impaired driving has been on the rise. The IASC modified the alcohol impaired driving CEA to encompass both alcohol impairment and drug impairment due to the similarities of safety improvement techniques and strategies. The IASC also modified the Roadway Departures CEA to also include lane departure crashes. These two crash types have similar strategies and safety countermeasures that can reduce lane departure and roadway departure crashes at the same time.

Non-motorist fatalities and serious injuries have been increasing nationally recently. Though Nebraska has not experienced this same trend, the IASC proactively identified the need to directly support improving safety for non-motorists. The creation of a new non-motorist CEA allows for a more direct impact on the annual non-motorist safety performance measure.

The IASWC included strategies within the CEAs to address other concerns such as distracted driving and excessive speed.

Possible Critical Emphasis Areas

Potential Critical Emphasis Areas	Total Related Crashes*				
	2016	2017	2018	2019	2020
Intersections	3,414	3,082	3,182	3,083	2,644
Unbelted Vehicle Occupants*	1,895	1,854	1,709	1,734	1,818
Roadway/Lane Departure	1,742	1,745	1,596	1,597	1,712
Young Drivers (Under 21)	1,513	1,397	1,372	1,338	1,278
Older Drivers (65+)	976	951	931	968	766
Alcohol/Drug Impaired Driving	716	666	628	572	582
Distracted Drivers	540	522	514	502	471
Pedestrians and Bicyclists*	477	453	403	413	303
Motorcycle	390	383	345	295	323
Commercial Motor Vehicles	361	373	377	423	367
Excessive Speed	277	230	308	288	260
Work Zone Safety	166	130	122	140	114
Fatigued Drivers	74	71	78	75	79
ATV/ROV	19	23	18	20	43
Highway Rail Crossings	2	3	8	8	3

*All figures are fatal, serious injury, and visible injury crashes, with the exception of seat belt usage, bicyclists, and pedestrians, which are fatalities, serious injuries, and visible injuries. Source: Nebraska Department of Transportation

Table 2.1

During October 2021, the IASWC conducted a survey of safety stakeholders statewide to obtain their input regarding the effectiveness of current strategies intended to address these emphasis areas. Stakeholders were also asked their opinion on Critical Emphasis Areas for the SHSP for 2022-2026. Highlights of the survey are as follows.

259 responses to the survey were received from safety stakeholders and the general public. Respondents represented one of five categories as follows:

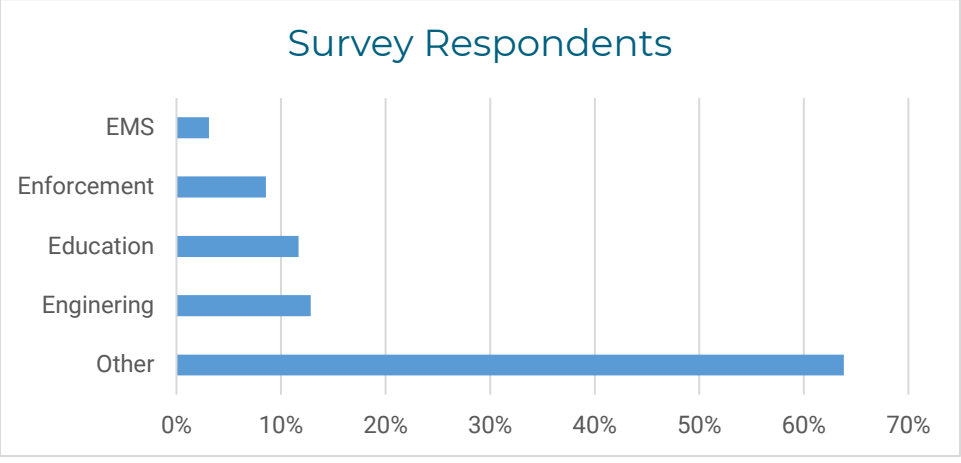


Figure 5

27% of respondents reported being familiar with the SHSP, while about half of respondents reported being familiar with the Toward Zero Deaths Initiative. 28% of the 4E respondents said that they currently use or refer to the SHSP in safety planning.

Of the strategies for the six Critical Emphasis Areas included in the 2017-2021 SHSP, respondents were asked which ones are working well to contribute to achieving the goals of reducing fatalities and serious injuries. The overwhelmingly most favorable opinion was for the edge line and centerline rumble strips. Respondents also expressed very favorable opinions for median barriers, shoulder widening, sobriety checkpoints, roundabouts, overhead street lighting, and a primary seat belt law.

Respondents were asked to choose a maximum of three highway safety areas from a list of 22 listed options where the 2022-2026 SHSP should direct its efforts (see Figure 5). Four of the top five responses were driver behavior concerns. The most frequently chosen options included:

- Distracted Drivers
- Excessive Speed
- Alcohol/drug Impaired Driving
- Aggressive Driving
- Intersections

The IASWC then compared the selected categories from the survey with 2016-2020 crash data (see Figures 6 and 7). Based on the survey data and crash data, the Working Committee chose to continue four CEAs, modify of two CEAs, and add one new CEA for the 2022-2026 SHSP. Nebraska has made continuous progress toward reducing alcohol impaired driving. However, recently drug impaired driving has been on the rise. The IASC modified the alcohol impaired driving CEA to encompass both alcohol impairment and drug impairment due to the similarities of safety improvement techniques and strategies. The IASC also modified the roadway departures CEA to also include lane departure crashes. These two crash types have similar strategies and safety countermeasures that can reduce lane departure and roadway departure crashes at the same time.

Guidance in the MAP-21 federal transportation act, requires that, if traffic fatalities and serious injuries per capita for drivers and pedestrians over the age of 65 in a State increases during the most recent two-year period for which data are available, that State shall be required to include, the subsequent Strategic Highway Safety Plan of the State, strategies to address the increases in those rates. The IASC has proactively added a CEA for older drivers and a CEA for pedestrians and bicyclist to address this requirement.

Non-motorist fatalities and serious injuries have been increasing nationally recently. Though Nebraska has not experienced this same trend, the IASC proactively identified the need to directly support improving safety for the non-motorists. The Infrastructure Investment and Jobs Act (IIJA) created a new requirement to obligate HSIP funds on non-motorist safety projects if the total annual fatalities of non-motorists are 15% or more of the total annual fatalities. The creation of a new non-motorist CEA allows for a more direct impact on the annual non-motorist safety performance measure and a direct way to meet this requirement.

The IASWC noted that driver behavioral concerns such as distracted driving and excessive speed overlap with many of the seven selected CEAs. The IASWC identified the need to include strategies within the CEAs to address distracted driving and excessive speed. NDOT will annually monitor crash data and advise the IASWC if changes to the SHSP are appropriate.

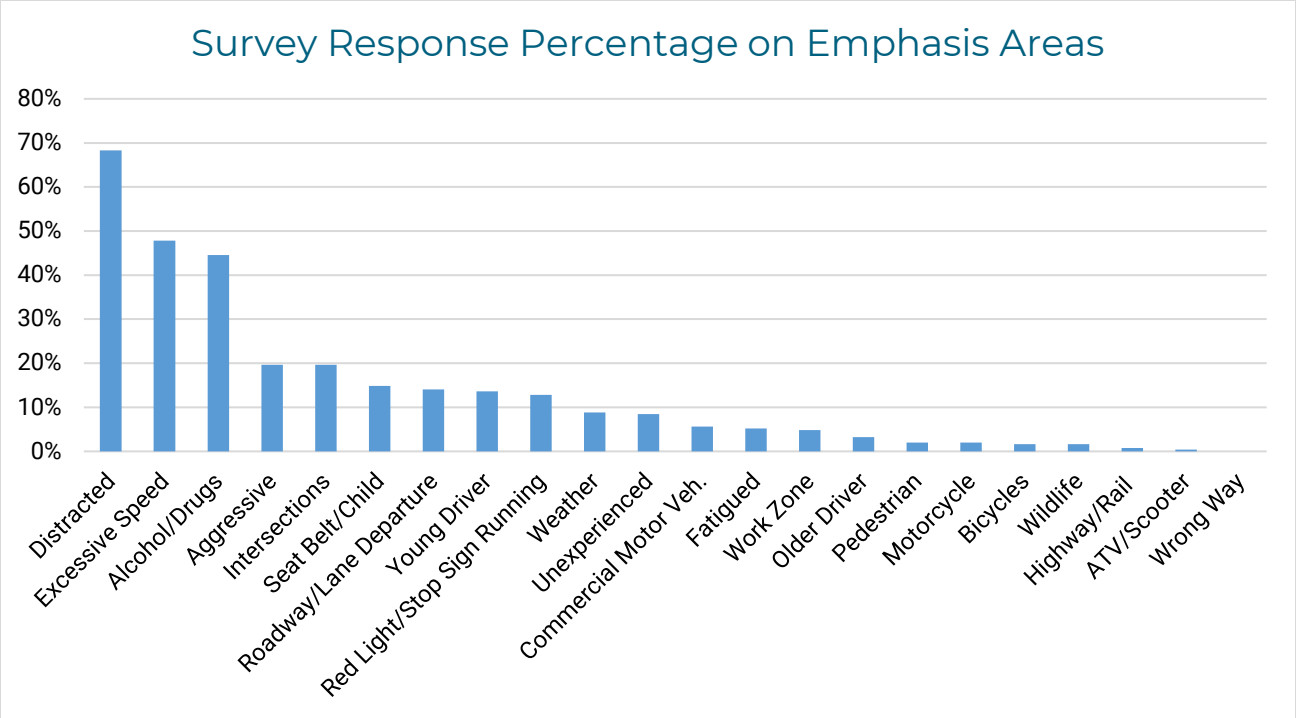
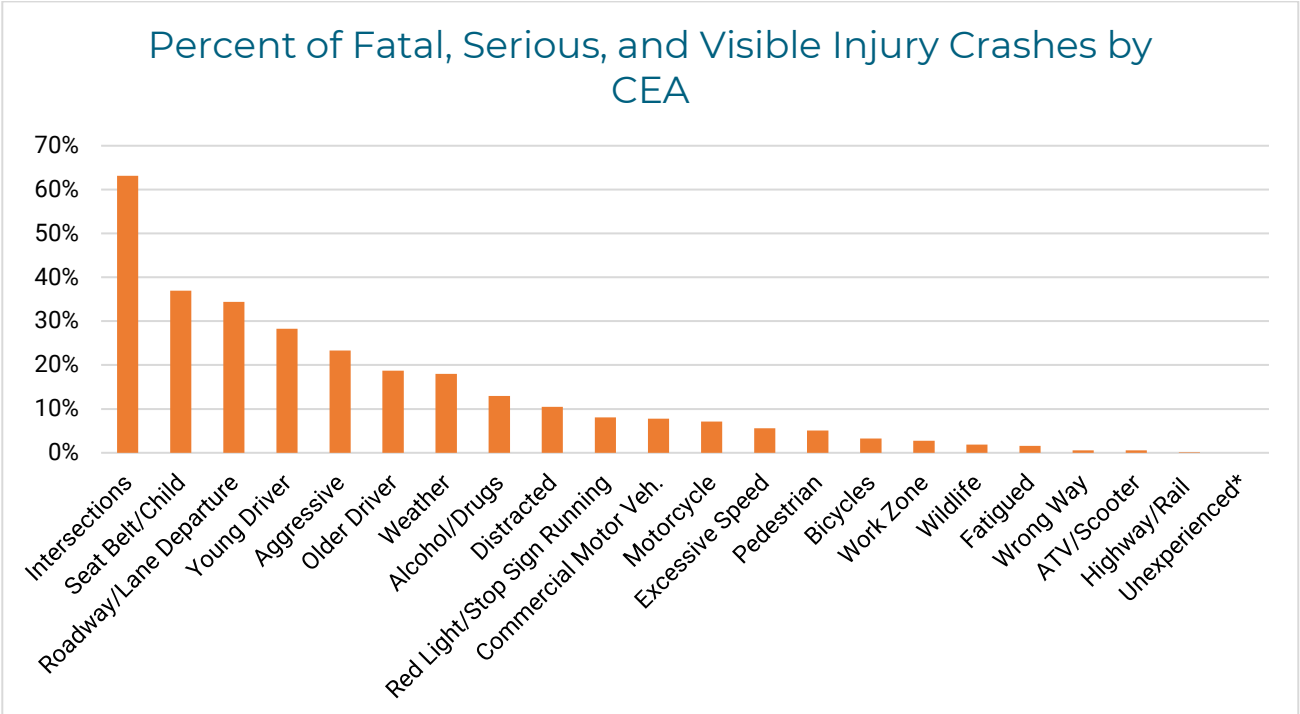


Figure 6



*All figures are fatal, serious injury, and visible injury crashes, with the exception of seat belt usage, bicyclists, and pedestrians, which are fatalities, serious injuries, and visible injuries. Crash data was not readily available for unexperienced drivers.
Source: Nebraska Department of Transportation

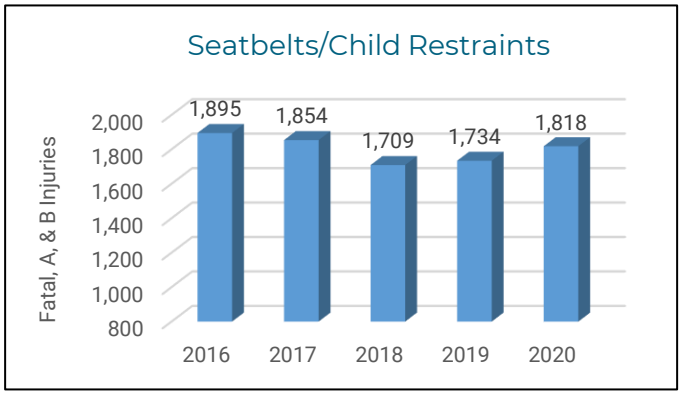
Figure 7

2.3 Crash Summaries for the Seven CEAs

In updating the SHSP for the next five-year period starting in 2021, the IASWC reviewed crash data trends from 2016 through 2020 for the seven CEAs. The following charts are based on number of crashes per CEA.

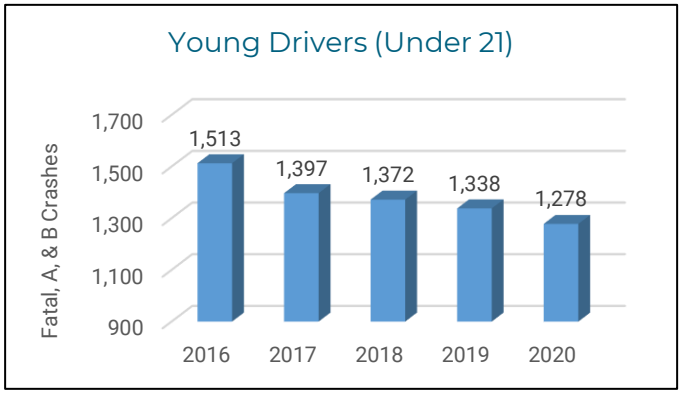
Seat belt usage decreased by 2.7 percentage points from 83.3% in 2016 to 80.6% in 2020.

Unbelted vehicle occupants accounted for 74% of all vehicle occupant deaths. While 70% of unbelted vehicle occupant fatalities occurred on rural roads.



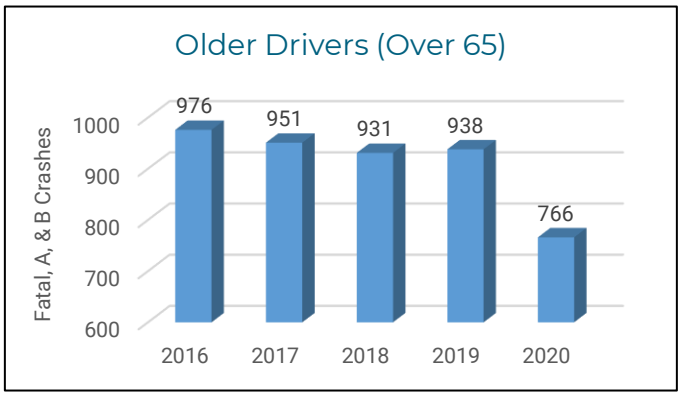
Youth-Involved (age 16 to 20) fatal, serious injury, and visible injury crashes decreased by 16% from 1,513 in 2016 to 1,278 in 2020.

The most common fatal and serious injury crash types involving a younger driver was the single vehicle run-off-the-road crash (33%), following by right angle collisions (25%).



Older Driver-Involved (age 65+) fatal, serious injury, and visible injury crashes decreased by 22% from 976 in 2016 to 766 in 2020.

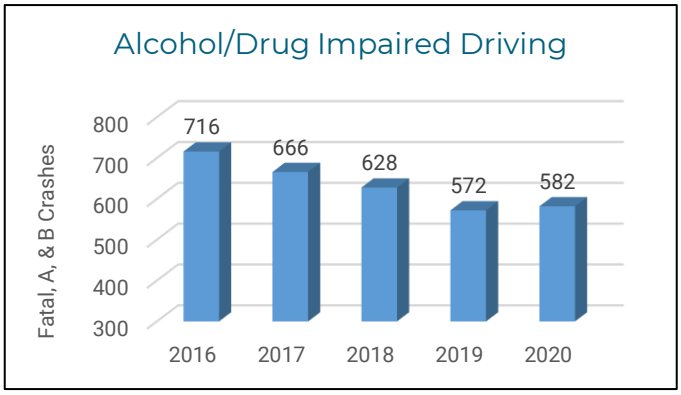
The most common crash type involving an older driver was the right angle collision (32%), following by rear-end and sideswipe same direction crashes (19%).



Impaired fatal, serious injury, and visible injury crashes decreased by 19% from 716 in 2016 to 582 in 2020.

Alcohol-impaired driving arrests dropped by 27% from 7,426 in 2016 to 5,425 in 2020.

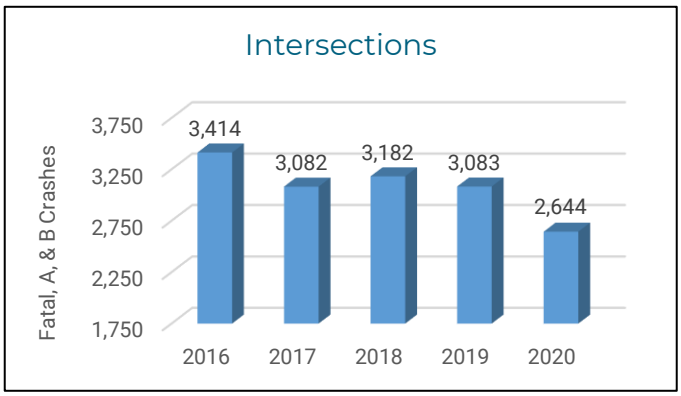
Alcohol or drug impairment accounted for approximately 34% of all traffic fatalities during the five-year period.



Intersection-related fatal, serious injury, and visible injury crashes decreased by 23% from 3,414 in 2016 to 2,644 in 2020.

From 2016 to 2020, 292 fatal crashes involved a collision at an unsignalized intersection, and 75 fatal crashes occurred at a signalized intersection.

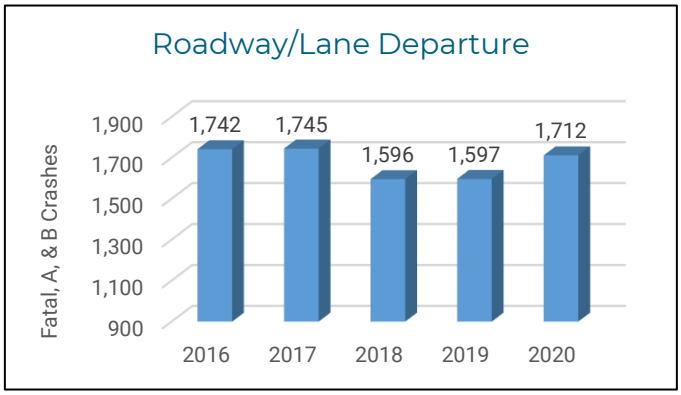
Intersection fatal and serious injury crashes were primarily in urban areas (2,438 of 3,556, 69%).



Roadway/lane departure fatal, serious injury, and visible injury crashes decreased by 2% from 1,742 in 2016 to 1,712 in 2020.

Roadway/lane departure fatal and serious injury crashes were primary in rural areas (2,150 of 3,133, 69%).

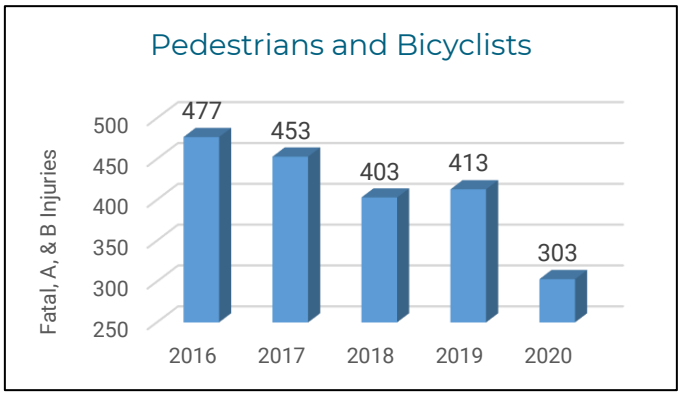
Most single vehicle run-off-the-road fatal crashes were overturned vehicles (201 of 414, 49%), following by vehicles striking trees (10%).



Fatal, serious injury, and visible injury crashes involving pedestrians and bicyclists decreased by 36% from 477 in 2016 to 303 in 2020.

Fatal and serious injury crashes involving pedestrians and bicyclists were primary in urban areas (524 of 623, 84%)

A majority of fatal crashes involving pedestrians and bicyclists were on local roads (55 of 99, 56%), followed by highways (37%).



In developing the 2022-2026 SHSP, the IASWC created the following fact sheets with 2016-2020 crash data for use in revising the plan. These pages are summaries of the characteristics of fatalities and serious injuries associated with the seven CEAs.

Crashes Involving Unbelted Vehicle Occupants

How Significant Is The Problem?

On Nebraska roadways, there were 653 unbelted vehicle occupant fatalities and 2,985 unbelted serious injuries during 2016-2020, which is an average of 131 fatalities and 597 serious injuries per year. Unbelted occupants accounted for 56% of all traffic fatalities during this five year period and 62% of all vehicle occupant fatalities.

During 2016-2020, seat belt usage in Nebraska ranged from 83.3% in 2016 to 80.6% in 2020 with an average seat belt usage of 83%. An unbelted occupant involved in a crash is 8 times more likely to result in a fatality than a belted occupant.

What is Nebraska's Goal?

To achieve Nebraska's fatality and serious injury goals, the number of annual unbelted fatalities needs to be reduced by 16. The number of unbelted serious injuries needs to be reduced by 99 per year.

What are the Contributing Factors?

Road and Area Type

- Unbelted vehicle occupant fatalities and serious injuries were slightly more likely to occur in rural areas (2,092 of 3,638, 58%).
- Local roads accounted for the greatest number of unbelted fatalities and serious injuries (1,884 of 3,638, 52%). Highways accounted for 39% of unbelted fatalities and serious injuries.

Jurisdiction Classification	Rural	Urban
Interstates	5%	4%
Highways	27%	12%
Local Roads	25%	27%
Total by Area Type	**58%**	**42%**

Location

- 42% (1,514 of 3,638) of unbelted vehicle occupant fatalities and serious injuries occurred at an intersection.
- The top 4 counties represent 41% (1,479 of 3,638) of unbelted vehicle occupant fatalities and serious injuries in Nebraska.

Top 4 Counties	Fatalities	Serious Injuries
Douglas	86 (13%)	835 (28%)
Lancaster	49 (8%)	247 (8%)
Sarpy	29 (4%)	113 (4%)
Hall	18 (3%)	102 (3%)

Crash Type

- 46% (1,687 of 3,638) of unbelted fatalities and serious injuries occurred during a single vehicle run-off-the-road (ROR) crash. Angle and left turn leaving crashes were the second most frequent crash types and accounted for 25% (921 of 3,638) of unbelted fatalities and serious injuries.

Crash Type	Fatalities	Serious Injuries
Single Vehicle: Run-off-the Road	325 (50%)	1,362 (46%)
Single Vehicle: Other	35 (5%)	194 (6%)
Rear End and Sideswipe (Same)	64 (10%)	371 (12%)
Head-On and Sideswipe (Opposite)	126 (19%)	230 (8%)
Angle and Left Turn (Leaving)	103 (16%)	818 (27%)

- Of the single vehicle ROR fatalities and serious injuries: 45% were overturn, 9% were in collisions with a ditch or embankment, 15% were in collisions with a tree, utility pole, or sign support.

The Passenger

- 63% (2,297 of 3,638) of the unbelted fatalities and serious were male.
- The drivers, age 25 to 34, had the most unbelted fatalities and serious injuries (598 of 2,634, 23%). The group with the second highest fatality and serious injury percentage was young drivers (age under 21), making up 15% of unbelted fatalities and serious injuries.

Occupant Fatalities and Serious Injuries		
Driver Age	**Male**	**Female**
≤ 20	445 (19%)	350 (27%)
21-24	274 (12%)	150 (11%)
25-34	504 (22%)	280 (21%)
35-44	313 (14%)	167 (13%)
45-54	266 (12%)	141 (11%)
55-64	260 (11%)	104 (8%)
65+	235 (10%)	124 (9%)
Totals by Gender*	**2,297 (63%)**	**1,316 (36%)**
* 25 Fatal and Serious Injuries Did Not Report Gender		
Population Total	**3,368 (100%)**	

- Alcohol was listed as a contributing factor in 28% (1,032 of 3,368) of unbelted fatalities and serious injuries.
- 762 (21%) of unbelted fatalities and serious injuries were totally ejected from their vehicles and 108 (3%) were reported as partially ejected.

Role of Seat Belt in Injury Severity

Between 2016 and 2020, 62% of the fatally injured drivers and passengers in vehicles were not using seat belts at the time of the crash.

Time of Day & Day of Week

- The highest 3-hour periods for unbelted vehicle occupant fatalities and serious injuries were 3:00 p.m. to 6:00 p.m.) with 19%. The early evening (6:00 p.m. to 9:00 p.m.) hours were second highest, with 14% of the fatalities and serious injuries. 40% of unbelted fatalities and serious injuries occurred during dark driving conditions (6:00 p.m. to 6:00 a.m.).

Time of Day	Fatalities & Serious Injuries	Percentage
Midnight to 02:59	362	10%
3:00 to 05:59	171	5%
6:00 to 08:59	346	10%
9:00 to 11:59	371	10%
12:00 to 14:59	456	13%
15:00 to 17:59	685	19%
18:00 to 20:59	521	14%
21:00 to 23:59	405	11%
Unknown	321	9%

- 49% (1,782 of 3,368) of unbelted fatalities and serious injuries occurred on Friday, Saturday, or Sunday. Saturday had the most unbelted fatalities and serious injuries (629 of 3,638).

Day of Week	Fatalities & Serious Injuries	Percentage
Sunday	548	15%
Monday	440	12%
Tuesday	470	13%
Wednesday	458	13%
Thursday	488	13%
Friday	605	17%
Saturday	629	17%

Safety Strategies

- Periodic Statewide Enforcement Operations
- Demonstration Units
- Primary Seat Belt Law
- Multi-Media Belt Use Campaign
- Child Passenger Protection Program

Roadway/Lane Departure Crashes

How Significant Is The Problem?

On Nebraska roadways, there were 3,133 fatal and serious injury crashes during 2016-2020 in which the crash was classified as a roadway or lane departure (2,563 run-off-the-road crashes, 367 sideswipe opposite crashes, and 203 head-on crashes). These crashes resulted in a 3,632 fatalities and serious injuries, which is an average of 726 fatalities and serious injuries per year. This accounts for 44% (3,133 of 8,302) of all traffic fatalities and serious injuries during the five year period.

What is Nebraska's Goal?

To achieve Nebraska's fatality and serious injury goals, the number of annual roadway/lane departure fatalities needs to be reduced by 16. The number of roadway/lane departure serious injuries needs to be reduced by 98 per year.

What are the Contributing Factors?

Road and Area Type

- Roadway/lane departure fatalities and serious injuries were primarily in rural areas (2,531 of 3,632, 70%).
- Local roads accounted for the greatest number of roadway/lane departure fatalities and serious injuries (1,722 of 3,632, 47%). Highways accounted for 40% of roadway/lane departure fatalities and serious injuries. 13 percent (472 of 3,632) of roadway/lane departure fatalities and serious injuries were on Interstate routes.

Jurisdiction Classification	Rural	Urban
Interstates	8%	5%
Highways	32%	8%
Local Roads	29%	18%
Total by Area Type	**70%**	**30%**

Location

- 20% (741 of 3,632) of roadway/lane departure fatalities and serious injuries occurred at an intersection.
- The top 5 counties represent 38% (1,364 of 3,632) of roadway/lane departure fatalities and serious injuries in Nebraska.

Top 5 Counties	Fatalities	Serious Injuries
Douglas	88 (13%)	612 (21%)
Lancaster	44 (7%)	258 (9%)
Sarpy	32 (5%)	129 (4%)
Hall	20 (3%)	81 (3%)
Lincoln	26 (4%)	74 (2%)

Crash Type

- 82% (2,563 of 3,133) fatal and serious injury roadway/lane departure crashes are single vehicle run-off-the-road (ROR) crashes. The most frequent fatal and serious injury single vehicle run-off-the-road crashes were overturned vehicles (1,198 of 2,561, 47%).

Crash Type	Fatalities	Serious Injuries
Overturn	211 (32%)	1,145 (29%)
Sideswipe (Opp.)	131 (20%)	372 (13%)
Head-On	92 (14%)	198 (7%)
Tree	47 (7%)	227 (8%)

Contributing Factors

- Alcohol was reported as a contributing factor in 29% (1,053 of 3,632) of roadway/lane departure fatalities and serious injuries.
- 56% of roadway/lane departure fatalities and serious injuries were vehicle occupants not using a seat belt.

The Driver

- 61% (2,212 of 3,362) of roadway/lane departure fatalities and serious injuries involved a male driver.
- Young drivers (age under 21) had the most roadway/lane departure fatalities and serious injuries (803 of 3,362, 22%). The group with the second highest fatality and serious injury percentage was drivers aged 25 to 34, making up 20% of roadway/lane fatalities and serious injuries.

Fatalities and Serious Injuries		
Driver Age	**Male**	**Female**
≤ 20	401 (18%)	402 (29%)
21-24	244 (11%)	148 (11%)
25-34	487 (22%)	255 (18%)
35-44	353 (16%)	169 (12%)
45-54	255 (12%)	174 (13%)
55-64	256 (12%)	129 (9%)
65+	216 (10%)	108 (8%)
Totals by Gender*	**2,212 (61%)**	**1,385 (38%)**
* 35 Fatal and Serious Injuries Did Not Report Gender		
Population Total	**3,362 (100%)**	

- The top driver contributing factors for fatal and serious injury roadway/lane departure crashes were:

Top 3 Contributing Factors	Fatalities & Serious Injuries
Failure To Keep In Lane Or Running Off Road	716 (20%)
Operating Vehicle In Erratic Manner	556 (15%)
Driving Too Fast For Conditions	273 (8%)

Weather & Road Surface Condition

- 86% (3,121 of 3,362) of roadway/lane departure fatalities and serious injuries occurred during good weather conditions (clear or cloudy). A majority (78%) of roadway/lane fatalities and serious injuries occurred during dry roadway surface conditions. The second most frequent road surface condition was snow, ice, or slush (367 of 3,362, 10%).

Time of Day & Day of Week

- 32% of roadway/lane departure fatalities and serious injuries occurred between 3:00 p.m. to 9:00 p.m.

Time of Day	Fatalities & Serious Injuries	Percentage
Midnight to 02:59	363	10%
3:00 to 05:59	211	6%
6:00 to 08:59	344	9%
9:00 to 11:59	338	9%
12:00 to 14:59	447	12%
15:00 to 17:59	622	17%
18:00 to 20:59	536	15%
21:00 to 23:59	399	11%
Unknown	372	10%

- 36% (1,314 of 3,362) of roadway/lane departure fatalities and serious injuries occurred on Saturday or Sunday. An additional 16% (626 of 3,362) occurred on Friday.

Day of Week	Fatalities & Serious Injuries	Percentage
Sunday	626	17%
Monday	423	12%
Tuesday	448	12%
Wednesday	406	11%
Thursday	456	13%
Friday	585	16%
Saturday	688	19%

Safety Strategies

- Edgeline and Centerline Rumble Strips
- Beveled Edge
- Add/Widen Surface Shoulders
- Widen Pavement Markings
- Curve Signing
- Median Barrier

Crashes Involving Alcohol Or Drug Impairment

How Significant Is The Problem?

On Nebraska roadways, 1,393 fatal and serious injury crashes during 2016-2020 were classified as involving alcohol or drug impairment. These crashes resulted in a total of 1,643 traffic fatalities and serious injuries, which is an average of 329 fatalities and serious injuries per year. This accounts for 20% of all traffic fatalities and serious injuries during the five year period.

What is Nebraska's Goal?

To achieve Nebraska's fatality and serious injury goals, the number of annual fatalities involving alcohol or drug impairment needs to be reduced by 9. The number of serious injuries in crashes involving alcohol or drug impairment needs to be reduced by 41 per year.

What are the Contributing Factors?

Road and Area Type

- Roadway/lane departure fatalities and serious injuries were primarily in rural areas (868 of 1,643, 53%).
- Local roads accounted for the greatest number of fatalities and serious injuries involving alcohol or drug impairment (887 of 1,643, 54%). Highways accounted for 38% of fatalities and serious injuries in impaired crashes.

Jurisdiction Classification	Rural	Urban
Interstates	4%	4%
Highways	25%	13%
Local Roads	24%	30%
Total by Area Type	**53%**	**47%**

Location

- 35% (582 of 1,643) of fatalities and serious injuries involving alcohol or drug impairment occurred at an intersection.
- The top 4 counties represent 72% (1,175 of 1,643) of alcohol or drug impairment involved fatalities and serious injuries in Nebraska.

Top 5 Counties	Fatalities	Serious Injuries
Douglas	89 (23%)	599 (48%)
Lancaster	37 (9%)	269 (21%)
Sarpy	23 (6%)	97 (8%)
Hall	9 (2%)	52 (4%)

Crash Type

- 64% (1,051 of 1,643) of the fatalities and serious injuries involving alcohol or drug impairment occurred during roadway/lane departure crash (run-off-the-road plus head-on plus sideswipe opposite). Angle and left turn leaving crashes accounted for 16% (258 of 1,643) of fatalities and serious injuries involving alcohol or drug impairment.

Crash Type	Fatalities	Serious Injuries
Single Vehicle: Run-off-the Road	219 (56%)	618 (49%)
Single Vehicle: Other	36 (9%)	129 (10%)
Rear End and Sideswipe (Same)	27 (7%)	138 (11%)
Head-On and Sideswipe (Opposite)	65 (17%)	149 (12%)
Angle and Left Turn (Leaving)	44 (11%)	214 (17%)

The Driver

- Of the 1,605 drivers involved in alcohol or drug impaired crashes with fatalities and serious injuries, 71% were male.
- 10% of the alcohol or drug impaired drivers in crashes resulting in fatal or serious injury were under the age of 21.

Fatalities and Serious Injuries		
Driver Age	**Male**	**Female**
≤ 20	92 (8%)	65 (14%)
21-24	150 (13%)	61 (13%)
25-34	339 (30%)	132 (28%)
35-44	215 (19%)	74 (16%)
45-54	148 (13%)	77 (17%)
55-64	134 (12%)	33 (7%)
65+	61 (5%)	24 (5%)
Totals by Gender*	**1,139 (71%)**	**466 (29%)**
Population Total	**1,605 (100%)**	

- Other than alcohol or drug use, the top driver contributing factors for fatal and serious injury crashes involving alcohol or drug impairment were:

Top 5 Contributing Factors	Fatalities & Serious Injuries
Operating Vehicle In Erratic Manner	356 (22%)
Failure To Keep In Lane Or Running Off Road	248 (15%)
Failed To Yield Right Of Way	71 (4%)
Disregarded Traffic Signs, Signals, Road Markings	52 (3%)
Exceeded Authorized Speed Limit	44 (3%)

The Passenger

- 44% (158 of 357) of vehicle passenger fatalities and serious injuries in crashes involving alcohol or drug impairment were unbelted.

Time of Day & Day of Week

- 39% of alcohol or drug impairment fatalities and serious injuries occurred between 9:00 p.m. to 3:00 a.m.

Time of Day	Fatalities & Serious Injuries	Percentage
Midnight to 02:59	326	20%
3:00 to 05:59	125	8%
6:00 to 08:59	70	4%
9:00 to 11:59	50	3%
12:00 to 14:59	95	6%
15:00 to 17:59	198	12%
18:00 to 20:59	300	18%
21:00 to 23:59	315	19%
Unknown	164	10%

- 44% (722 of 1,643) of fatalities and serious injuries in crashes involving alcohol or drug impairment occurred on Saturday or Sunday.

Day of Week	Fatalities & Serious Injuries	Percentage
Sunday	329	20%
Monday	164	10%
Tuesday	163	10%
Wednesday	167	10%
Thursday	180	11%
Friday	247	15%
Saturday	393	24%

Safety Strategies

- Periodic Statewide Enforcement Operations
- Conduct Sobriety Checkpoints
- Open Container and Repeat Offender Laws
- Judicial and Prosecution Training
- Drug Recognition Expert Training
- Alcohol Server/Seller Training
- Administrative License Revocation Law
- 0.08 BAC and Zero Tolerance Laws
- Underage Alcohol Enforcement Operations

Crashes at Intersections

How Significant Is The Problem?

3,556 fatal and serious injury crashes during 2016-2020 occurred at an intersection. These crashes resulted in a 4,140 fatalities and serious injuries, which is an average of 828 fatalities and serious injuries per year. This accounts for 50% (4,140 of 8,302) of all traffic fatalities and serious injuries during the five year period.

What is Nebraska's Goal?

To achieve Nebraska's fatality and serious injury goals, the number of annual fatalities at intersections needs to be reduced by 10. The number of serious injuries at intersections needs to be reduced by 123 per year.

What are the Contributing Factors?

Road and Area Type

- Fatalities and serious injuries at intersections were primarily in urban areas (2,772 of 4,140, 67%).
- Local roads accounted for the greatest number of fatalities and serious injuries at intersections (2,044 of 4,140, 49%). Highways accounted for 43% of fatalities and serious injuries at intersections. Seven percent (308 of 4,140) of fatalities and serious injuries at an intersection were on Interstate routes.

Jurisdiction Classification	Rural	Urban
Interstates	2%	5%
Highways	20%	23%
Local Roads	11%	39%
Total by Area Type	**33%**	**67%**

Location

- The top 4 counties represent 62% (2,564 of 4,140) of fatalities and serious injuries occurred at an intersection.

Top 4 Counties	Fatalities	Serious Injuries
Douglas	115 (29%)	1,318 (35%)
Lancaster	37 (9%)	592 (16%)
Sarpy	27 (7%)	298 (8%)
Hall	16 (4%)	161 (4%)

Crash Type

- 44% (1,677 of 3,830) of the fatal and serious injury crashes at intersections were angle crashes. Left turn leaving crashes were the second most frequent crash type and accounted for 19% (712 of 3,830) of intersection crashes.

Crash Type	Fatal Crashes	Serious Injury Crashes
Single Vehicle	68 (19%)	615 (18%)
Rear End	30 (8%)	483 (14%)
Sideswipe (Same)	14 (4%)	99 (3%)
Head-On and Sideswipe (Opposite)	32 (9%)	93 (3%)
Angle	170 (46%)	1,507 (44%)
Left Turn (Leaving)	53 (14%)	659 (19%)

Weather & Road Surface Condition

- 91% (3,784 of 4,140) of fatalities and serious injuries at intersections occurred during good weather conditions (clear or cloudy). A majority (86%) of fatalities and serious injuries at intersections occurred during dry roadway surface conditions. The second most frequent road surface condition was wet (406 of 1,140, 10%).

The Driver

- 55% (2,108 of 3,830) of the drivers in fatal and serious injury crashes at an intersection were male.
- Drivers aged 25 to 34 were most frequently involved in fatal and serios injuries crashes at an intersection (702 of 3,830, 18%). The group with the second highest fatality and serious injury percentage was young drivers (under age 21), making up 17% of intersection fatalities and serious injuries.

Fatalities and Serious Injuries		
Driver Age	**Male**	**Female**
≤ 20	329 (16%)	332 (20%)
21-24	225 (11%)	128 (8%)
25-34	406 (19%)	296 (17%)
35-44	262 (12%)	226 (13%)
45-54	280 (13%)	213 (13%)
55-64	309 (15%)	193 (11%)
65+	297 (14%)	307 (18%)
Totals by Gender*	**2,108 (55%)**	**1,695 (44%)**
* 27 Fatal and Serious Injuries Did Not Report Gender		
Population Total	**3,830 (100%)**	

- The top driver contributing factors for fatal and serious injury crashes at intersections were:

Top 5 Contributing Factors	Fatalities & Serious Injuries
Failure To Yield Right Of Way	596 (16%)
Operating Vehicle In Erratic Manner	342 (9%)
Disregarded Traffic Signs, Signals, Road Markings	327 (9%)
Failure To Keep In Lane Or Running Off Road	180 (5%)
Inattention	169 (4%)

Time of Day & Day of Week

- 41% of fatalities and serious injuries at intersections occurred between 12:00 p.m. to 6:00 p.m.

Time of Day	Fatalities & Serious Injuries	Percentage
Midnight to 02:59	229	6%
3:00 to 05:59	129	3%
6:00 to 08:59	433	10%
9:00 to 11:59	504	12%
12:00 to 14:59	736	18%
15:00 to 17:59	950	23%
18:00 to 20:59	636	15%
21:00 to 23:59	401	10%
Unknown	122	3%

- 33% (1,354 of 4,140) of intersection fatalities and serious injuries occurred on Friday or Saturday.

Day of Week	Fatalities & Serious Injuries	Percentage
Sunday	493	12%
Monday	547	13%
Tuesday	565	14%
Wednesday	578	14%
Thursday	603	15%
Friday	707	17%
Saturday	647	16%

Safety Strategies

- Red Light Running Enforcement Campaigns
- Roundabouts
- Advance Warning Detection
- Enhance Signing And Post Reflective Sheeting
- Restricted Crossing U-Turns
- Educational Materials On Intersection Traffic Control Devices

Crashes Involving Younger Drivers

How Significant Is The Problem?

On Nebraska roadways, there were 1,522 fatal and serious injury crashes during 2016-2020 that involved a young driver (age under 21). These crashes resulted in 1,880 fatalities and serious injuries, which is an average of 376 fatalities and serious injuries per year. This accounts for 23% (1,880 of 8,302) of all traffic fatalities and serious injuries during the five year period.

What is Nebraska's Goal?

To achieve Nebraska's fatality and serious injury goals, the number of annual traffic fatalities involving a young driver needs to be reduced by 5. The number of serious injuries from crashes involving young drivers needs to be reduced by 55 per year.

What are the Contributing Factors?

Road and Area Type

- Fatalities and serious injuries involving young drivers were primarily in rural areas (1,009 of 1,880, 54%).
- Local roads accounted for the greatest number of fatalities and serious injuries involving young drivers (1,120 of 1,880, 60%). Highways accounted for 34% of fatalities and serious injuries in crashes involving young drivers.

Jurisdiction Classification	Rural	Urban
Interstates	4%	3%
Highways	24%	10%
Local Roads	26%	34%
Total by Area Type	**54%**	**46%**

Location

- 26% (1,089 of 4,140) of intersection fatalities and serious injuries involved a young driver.
- The top 4 counties represent 52% (977 of 1,880) of fatalities and serious injuries from crashes involving younger drivers in Nebraska.

Top 4 Counties	Fatalities	Serious Injuries
Douglas	25 (12%)	455 (27%)
Lancaster	23 (11%)	262 (16%)
Sarpy	14 (7%)	138 (8%)
Buffalo	9 (4%)	51 (3%)

Crash Type

- 40% (602 of 1,522) fatal and serious injury crashes involving a young driver are angle or left turn leaving crashes. Single vehicle run-off-the-road crashes accounted for 32% (492 of 1,522) of involving young drivers.

Crash Type	Fatalities	Serious Injuries
Single Vehicle: Run-off-the Road	60 (29%)	470 (28%)
Single Vehicle: Other	15 (7%)	41 (2%)
Rear End and Sideswipe (Same)	34 (16%)	271 (16%)
Head-On and Sideswipe (Opposite)	45 (22%)	184 (11%)
Angle and Left Turn (Leaving)	55 (26%)	700 (42%)
Backing	0 (0%)	5 (1%)

Contributing Factors

- Of the fatal and serious injury crashes involving a young driver, 15% involved an impaired driver.

The Driver

- 58% (1,096 of 1,906) of young driver fatalities and serious injuries involved a female driver.
- There is a noticeable increase in the involvement of young drivers at the age of 16.

Fatalities and Serious Injuries		
Driver Age	**Male**	**Female**
≤ 14	24 (3%)	32 (3%)
15	31 (4%)	52 (5%)
16	123 (17%)	203 (19%)
17	128 (16%)	173 (16%)
18	170 (21%)	227 (21%)
19	142 (19%)	227 (21%)
20	192 (20%)	182 (17%)
Totals by Gender*	**810 (42%)**	**1,096 (58%)**
Population Total	**1,906 (100%)**	

- The top driver contributing factors for fatal and serious injury crashes involving young drivers were:

Top 5 Contributing Factors	Fatalities & Serious Injuries
Operating Vehicle In Erratic Manner	235 (12%)
Failed To Yield Right Of Way	216 (11%)
Disregarded Traffic Signs, Signals, Road Markings	139 (7%)
Failure To Keep In Lane Or Running Off Road	138 (7%)
Inattention	96 (5%)

Weather & Road Surface Condition

- 89% (1,678 of 1,880) of fatalities and serious injuries involving young drivers occurred during good weather conditions (clear or cloudy). A majority (84%) of fatalities and serious injuries involving young drivers occurred during dry roadway surface conditions. The second most frequent road surface condition was snow, ice, or slush (77 of 1,880, 5%).

Time of Day & Day of Week

- 41% of fatalities and serious injuries involving young drivers occurred between 3:00 p.m. to 9:00 p.m.

Time of Day	Fatalities & Serious Injuries	Percentage
Midnight to 02:59	108	6%
3:00 to 05:59	57	3%
6:00 to 08:59	152	8%
9:00 to 11:59	156	8%
12:00 to 14:59	282	15%
15:00 to 17:59	438	23%
18:00 to 20:59	339	18%
21:00 to 23:59	259	14%
Unknown	89	5%

- 33% (620 of 1,880) of fatalities and serious injuries involving young drivers occurred on Saturday or Sunday. An additional 16% (294 of 1,880) occurred on Friday.

Day of Week	Fatalities & Serious Injuries	Percentage
Sunday	296	16%
Monday	246	13%
Tuesday	210	11%
Wednesday	255	14%
Thursday	255	14%
Friday	294	16%
Saturday	324	17%

Safety Strategies

- Underage Alcohol Enforcement Operations
- Underage Drinking Tip Line
- Teens in the Driver's Seat Program
- Graduated Driver's Licensing
- 0.08 BAC and Zero Tolerance Laws

Crashes Involving Older Drivers

How Significant Is The Problem?

On Nebraska roadways, there were 1,329 fatal and serious injury crashes during 2016-2020 that involved an older driver (age 65 or older). These crashes resulted in 1,725 fatalities and serious injuries, which is an average of 345 fatalities and serious injuries per year. This accounts for 31% (1,725 of 8,302) of all traffic fatalities and serious injuries during the five year period.

What is Nebraska's Goal?

To achieve Nebraska's fatality and serious injury goals, the number of annual traffic fatalities involving an older driver needs to be reduced by 6. The number of serious injuries from crashes involving older drivers needs to be reduced by 48 per year.

What are the Contributing Factors?

Road and Area Type

- Fatalities and serious injuries involving older drivers were primarily in rural areas (898 of 1,725, 52%).
- Highways accounted for the greatest number of fatalities and serious injuries involving older drivers (891 of 1,725, 52%). Local roads accounted for 39% of fatalities and serious injuries in crashes involving an older driver.

Jurisdiction Classification	Rural	Urban
Interstates	7%	2%
Highways	34%	18%
Local Roads	11%	28%
Total by Area Type	**52%**	**48%**

Location

- 65% (1,117 of 1,725) of fatalities and serious injuries involving an older driver occurred at an intersection.
- The top 4 counties represent 41% (701 of 1,725) of fatalities and serious injuries from crashes involving older drivers in Nebraska.

Top 4 Counties	Fatalities	Serious Injuries
Douglas	27 (10%)	288 (20%)
Lancaster	13 (5%)	195 (13%)
Sarpy	15 (6%)	96 (7%)
Hall	11 (4%)	56 (4%)

Crash Type

- 46% (616 of 1,329) fatal and serious injury crashes involving an older driver are angle or left turn leaving crashes. Rear-end and sideswipe same direction crashes accounted for 19% (249 of 1,329) of crashes involving older drivers.

Crash Type	Fatalities	Serious Injuries
Single Vehicle: Run-off-the Road	53 (21%)	190 (13%)
Single Vehicle: Other	13 (5%)	96 (7%)
Rear End and Sideswipe (Same)	39 (15%)	308 (21%)
Head-On and Sideswipe (Opposite)	57 (22%)	152 (10%)
Angle and Left Turn (Leaving)	96 (37%)	721 (34%)

Contributing Factors

- Of the fatal and serious injury crashes involving an older driver, 7% involved an impaired driver.

The Driver

- 65% (2,150 of 3,306) of older driver fatalities and serious injuries involved a female driver.

Fatalities and Serious Injuries		
Driver Age	**Male**	**Female**
65-69	202 (19%)	435 (20%)
70-74	131 (12%)	238 (11%)
75-79	97 (8%)	179 (8%)
80-84	68 (6%)	120 (6%)
85-89	39 (4%)	83 (4%)
90+	11 (1%)	20 (1%)
Totals by Gender*	**1,156 (35%)**	**2,150 (65%)**
Population Total	**3,306 (100%)**	

- The top driver contributing factors for fatal and serious injury crashes involving older drivers were:

Top 4 Contributing Factors	Fatalities & Serious Injuries
Failed To Yield Right Of Way	311 (19%)
Disregarded Traffic Signs, Signals, Road Markings	109 (7%)
Failure To Keep In Lane Or Running Off Road	83 (5%)
Inattention	83 (5%)

Weather & Road Surface Condition

- 90% (1,555 of 1,725) of fatalities and serious injuries involving older drivers occurred during good weather conditions (clear or cloudy). A majority (86%) of fatalities and serious injuries involving older drivers occurred during dry roadway surface conditions. The second most frequent road surface condition was snow, ice, or slush (88 of 1,725, 5%).

Time of Day & Day of Week

- 51% of fatalities and serious injuries involving older drivers occurred between 12:00 p.m. to 6:00 p.m.

Time of Day	Fatalities & Serious Injuries	Percentage
Midnight to 02:59	26	2%
3:00 to 05:59	33	2%
6:00 to 08:59	169	10%
9:00 to 11:59	302	18%
12:00 to 14:59	413	24%
15:00 to 17:59	466	27%
18:00 to 20:59	204	12%
21:00 to 23:59	64	4%
Unknown	48	3%

- 34% (580 of 1,725) of fatalities and serious injuries involving older drivers occurred on Thursday or Friday. An additional 16% (268 of 1,725) occurred on Wednesday.

Day of Week	Fatalities & Serious Injuries	Percentage
Sunday	174	10%
Monday	234	14%
Tuesday	254	15%
Wednesday	268	16%
Thursday	273	16%
Friday	307	18%
Saturday	215	12%

Safety Strategies

- Roundabouts
- Advance Warning Detection
- Wider Pavement Markings
- Larger Signs and Signal Heads
- Restricted Crossing U-Turns
- Edgeline and Centerline Rumble Strips
- Median Barriers
- Beveled Edge

Crashes Involving Non-Motorists

How Significant Is The Problem?

On Nebraska roadways, there were 623 fatal and serious injury crashes during 2016-2020 that involved a non-motorist. These crashes resulted in a 636 fatalities and serious injuries, which is an average of 127 fatalities and serious injuries per year. This accounts for 8% (636 of 8,302) of all traffic fatalities and serious injuries during the five year period. Additional information on non-motorist crashes is available in the Vulnerable Road User Assessment in Appendix A.

What is Nebraska's Goal?

To achieve Nebraska's fatality and serious injury goals, the number of annual non-motorist fatalities needs to be reduced by 2. The number of non-motorist serious injuries needs to be reduced by 18 per year.

What are the Contributing Factors?

Road and Area Type

- Non-motorist fatalities and serious injuries were primarily in urban areas (534 of 636, 84%).
- Local roads accounted for the greatest number of non-motorist fatalities and serious injuries (437 of 636, 69%). Highways accounted for 27% of non-motorist fatalities and serious injuries. Four percent (26 of 636) of non-motorist fatalities were on Interstate routes.

Jurisdiction Classification	Rural	Urban
Interstates	2%	2%
Highways	7%	21%
Local Roads	8%	61%
Total by Area Type	**16%**	**84%**

Location

- 49% (310 of 363) of non-motorist fatalities and serious injuries occurred at an intersection.
- The top 3 counties represent 65% (412 of 363) of non-motorist fatalities and serious injuries in Nebraska.

Top 3 Counties	Fatalities	Serious Injuries
Douglas	34 (33%)	220 (41%)
Lancaster	13 (13%)	105 (20%)
Sarpy	6 (6%)	34 (6%)

Crash Type

- 78% (498 of 636) non-motorist fatal and serious injuries were pedestrians. The second most frequent fatal and serious injuries were bicyclists (134 of 636, 21%).

Non-Motorist Type	Fatalities	Serious Injuries
Pedestrian	95 (93%)	1,145 (29%)
Bicyclist	6 (6%)	372 (13%)
Other Non-Motorist	1 (1%)	198 (7%)
Total	**102 (100%)**	**534 (100%)**

Contributing Factors

- The top 3 non-motorist locations prior to impact for non-motorist fatal and serious injury crashes were:

Top 3 Non-Motorist Locations Prior To Impact	Fatalities	Serious Injuries
In Roadway	54 (53%)	244 (46%)
Marked Crosswalk At Intersection	12 (12%)	87 (16%)
At Intersection But No Crosswalk	7 (7%)	39 (7%)

The Non-Motorist

- 68% (432 of 636) of non-motorist fatalities and serious injuries involved a male non-motorist.
- Young non-motorists (age under 21) had the most non-motorist fatalities and serious injuries (176 of 636, 28%). The group with the second highest fatality and serious injury percentage was non-motorists aged 45 to 54, making up 14% of non-motorist fatalities and serious injuries.

Fatalities and Serious Injuries		
Non-Motorist Age	**Male**	**Female**
≤ 20	119 (28%)	57 (28%)
21-24	28 (6%)	12 (6%)
25-34	59 (14%)	30 (15%)
35-44	57 (13%)	25 (12%)
45-54	63 (15%)	29 (14%)
55-64	59 (14%)	25 (12%)
65+	47 (11%)	18 (9%)
Totals by Gender*	**432 (68%)**	**204 (32%)**
* 8 Fatal and Serious Injuries Did Not Report Gender		
Population Total	**636 (100%)**	

- The top 3 non-motorist contributing circumstances for non-motorist fatal and serious injury crashes were:

Top 3 Non-Motorist Contributing Circumstances	Fatalities & Serious Injuries
Improper Crossing	126 (20%)
Darting	61 (10%)
Failure To Obey Traffic Signs, Signal, Officer	37 (6%)

The Driver

- The top driver contributing factors for fatal and serious injury crashes involving non-motorist were:

Top 3 Contributing Factors	Fatalities & Serious Injuries
Failed To Yield Right Of Way	59 (9%)
Inattention	54 (9%)
Operating Vehicle In Erratic Manner	37 (6%)

Light/Dark Condition

- 54% (346 of 636) of non-motorist fatalities and serious injuries occurred during daylight. The second most frequent light/dark condition for non-motorist fatalities and serious injuries was dark with lighted roadway (197 of 636, 31%). Eight percent of non-motorist fatalities and serious injuries occurred under dark roadway not lighted conditions.

Time of Day & Day of Week

- 41% of non-motorist fatalities and serious injuries occurred between 3:00 p.m. to 9:00 p.m.

Time of Day	Fatalities & Serious Injuries	Percentage
Midnight to 02:59	46	7%
3:00 to 05:59	34	5%
6:00 to 08:59	70	11%
9:00 to 11:59	57	9%
12:00 to 14:59	74	12%
15:00 to 17:59	135	21%
18:00 to 20:59	125	20%
21:00 to 23:59	82	13%
Unknown	13	2%

- 35% (218 of 636) of non-motorist fatalities and serious injuries occurred on Wednesday or Friday.

Day of Week	Fatalities & Serious Injuries	Percentage
Sunday	81	13%
Monday	82	13%
Tuesday	75	12%
Wednesday	99	16%
Thursday	89	14%
Friday	119	19%
Saturday	91	14%

Safety Strategies

- High Visibility Crosswalk Markings
- Rectangular Rapid Flashing Beacons
- Roundabouts
- Road Diets
- ADA Ramps & Curb Extensions
- Crosswalk Overhead Lighting

2.4 HSIP and Safety Performance Management Measures

The FHWA published the Highway Safety Improvement Program (HSIP) and Safety Performance Management Measures (Safety PM) Final Rules in the Federal Register on March 15, 2016. The HSIP Final Rule updated the HSIP regulation under 23 CFR Part 924 to be consistent with MAP-21 and the FAST Act clarified existing program requirements. The Safety PM Final Rule added regulations to implement the performance management requirements in 23 U.S.C. 150. The Safety PM rule established safety performance measures to carry out the HSIP and to assess serious injuries and traffic fatalities on all public roads. Together, these regulations will improve data, foster transparency and accountability, and allow safety progress to be tracked at the national level.

2.4.1 HSIP Final Rule

The HSIP is a core Federal-aid program with the purpose to achieve reductions in fatalities and serious injuries on all public roads. The HSIP Final Rule contains three major policy changes related to: (1) the HSIP report content and schedule, (2) the Strategic Highway Safety Plan (SHSP) update cycle, and (3) the subset of the model inventory of roadway elements (MIRE), also known as the MIRE fundamental data elements. To comply with the regulation, the IASC will continue to update the Nebraska SHSP on a five-year cycle.

2.4.2 Safety PM Final Rule

The Safety PM Final Rule established five performance measures to carry out the HSIP: the five-year rolling averages for: (1) Number of Fatalities, (2) Rate of Fatalities per 100 million VMT, (3) Number of Serious Injuries, (4) Rate of Serious Injuries per 100 million VMT, and (5) Number of Non-motorized Fatalities and Non-motorized Serious Injuries. These safety performance measures are applicable to all public roads regardless of ownership or functional classification. The Safety PM Final Rule also established a common national definition for serious injuries.

2.4.3 State Targets

States establish statewide targets for each of the safety performance measures. These targets have been established annually beginning with calendar year 2018. For three performance measures (number of fatalities, rate of fatalities, and number of serious injuries), targets must be identical with the HSO's Highway Safety Plan's performance measures.

The NDOT establishes safety performance targets for the five performance measures, which NDOT includes in the State's annual Highway Safety Plan (HSP) and the HSIP Report. The safety performance management target information is available on the FWHA Performance Target website. The NDOT coordinates with the metropolitan planning organizations in the state on the establishment of targets annually.

2.4.4 Metropolitan Planning Organization (MPO) Targets

MPOs establish targets for the same five safety performance measures for all public roads in the MPO planning area within 180 days after the State establishes each target. The targets are established in coordination with the State. Each MPO can either agree to support the NDOT target or establish a numerical target specific to the MPO planning area. MPOs' targets are reported to NDOT, which must be able to provide the targets to FHWA.

2.4.5 Met or Made Significant Progress Determination

A state is considered to have met or made significant progress toward meeting its safety targets when at least 4 of the 5 targets are met or the outcome for the performance measure is better than the baseline performance the year prior to the target year. Optional urbanized area or non-urbanized area targets will not be evaluated. Each year that FHWA determines a state has not met or made significant progress toward meeting its performance targets, the state will be required to use HSIP funding obligation authority equal to the baseline year HSIP apportionment only for safety projects. States must also develop a HSIP Implementation Plan.

The NDOT has elected to develop a HSIP Implementation Plan each year even if Nebraska has met or made significant progress toward meeting its safety targets.

3. Achieving the SHSP Goal

3.1 Identified Deployment Strategies

The IASWC and a wide variety of safety partners will continue to seek potential safety strategies for new and innovative ways to help achieve the state's overall goal. There are hundreds of potential investment strategies. However, experience suggests that only a combination of a few strategies will be the most effective at achieving the stated fatal and serious injury crash reduction goals.

This section identifies overall programs and plans for various State agencies that provide countermeasures and guidance on where and how to invest safety funds and resources in order to achieve the safety goal and to provide proof that the goal is, in fact, attainable.

Nebraska Highway Safety Improvement Program (HSIP) Committees

The NDOT utilizes three internal safety teams to develop highway safety projects funded through the HSIP. Each team evaluates safety projects for their benefit-cost to select projects with higher degrees of success. The NDOT Highway Safety Committee will continue to review safety improvement projects submitted by counties and cities and recommend safety projects for locations identified through the Hazardous Location Analysis Program. The Strategic Safety Infrastructure Projects Team will review major and statewide projects, such as roundabouts, cable median barriers, and statewide shoulder and centerline rumble strip projects. The High Risk Rural Roads Team will continue to identify and review projects on non-state highways that formerly qualified for HRRRP funding. The team will continue to focus on statewide projects such as bridge object markers, horizontal curve signing, and intersection signing, as well as individual county projects.

The HSIP Implementation Plan

In support of the annual safety performance measures, the Nebraska Department of Transportation (NDOT) has created a new annual HSIP Implementation Plan that replaced the HSIP Expenditures Plan. The FHWA and the NDOT have collaborated on a list of countermeasures to sustain consistent obligations of federal HSIP funds. Use of these funds helps promote NDOT's strategic goal for safety by developing projects to reduce the frequency and severity of crashes on Nebraska's roads. The strategic implementation plan also supports NDOT's strategic goal of fiscal responsibility by providing the framework for the prudent selection of projects. The plan describes proposed safety countermeasures, as well as a list of proposed projects to implement these countermeasures. The plan also incorporates planned projects and funding for the Rail Highway Crossing Program (RHCP), an integral part of NDOT's Safety Program.

Local Roads Safety Plans

Since 70% of traffic fatalities occurred on rural roadways during the 2016-2020 time period, the NDOT, in compliance with the Nebraska SHSP, has been seeking technical assistance in prioritization and deployment of safety countermeasures within various county agencies throughout the State. The intention of these Local Road Safety Plans (LRSP) is to assist counties in identifying corridors that may benefit from systemic, low cost safety improvements. The primary focus is to provide direction to the county in terms of prioritization of roadway safety needs within their county. Whenever possible, members of the "4 E's" (Engineering, Enforcement, Emergency Medical Services, and Education) and cities in the county will be encouraged to participate in the development of the LRSP. NDOT believes this plan will assist the county in delivering specific roadway safety projects in accordance with the SHSP.

NDOT has piloted local road safety plans for four counties (Adams, Lancaster, Platte, & Scotts Bluff) in hopes of expanding this program to additional counties in the future.

Highway Safety Office Plan

The annual Nebraska Performance-Based Strategic Traffic Safety Plan (HSP) identifies and prioritizes Nebraska's safety problems contributing to traffic-related fatalities and injuries. The Plan establishes those priority problems and identifies the best opportunities to reduce traffic-related fatalities and injuries. The plan also includes those system support activities necessary to carry out direct impact projects.

In addition to three driver behavior CEAs in the SHSP (occupant restraint use, young drivers, and alcohol impairment), the NDOT HSO has also identified speed-related crashes as a priority emphasis area. Based on an annual evaluation of crash data, the HSO identifies counties for priority consideration for grant awards and project activity. The remaining counties receive consideration for special programs and assistance. Using five-year historical data, the HSO determines measurable targets and objectives. Annual targets are selected based upon expected trends. The HSO awards individual grants based upon the quality of problem identification and the outcome performance expected while implementing strategies and activities.

Nebraska State Patrol – Community Policing Services

The Nebraska State Patrol Community Policing Services is a partnership between law enforcement agencies and the communities they serve. Community Policing focuses on problem identification and solving. Troopers assigned to provide Community Policing Services work closely with schools, businesses, organizations, and groups to focus on fatality reduction efforts and crime prevention. The Nebraska State Patrol utilizes a variety of tools such as the rollover simulator, seat belt convincer, distracted driving simulator, and other safety-related programs.

Nebraska Carrier Enforcement Plan

The Carrier Enforcement Division will continue to conduct Metropolitan Aggressive Preventative Selectives (MAPS) during the summer months in identified high crash corridors throughout the state in cooperation with local police and sheriff's departments to target vehicles and drivers who do not normally come through our scale facilities. The Division utilizes social media to leverage technology and disseminate safety messages related to commercial vehicles and awareness of potential hazards to subscribers and news organizations regularly.

NCHRP Report 500

For this SHSP, as well as the previous three SHSPs, the IASWC referenced the NCHRP Report 500, "Guidance and Implementation of the AASHTO SHSP." The plan includes strategies and an outline of what is needed to implement each strategy to address each CEA for the 4E's (Engineering, Education, Enforcement, and Emergency Medical Services).

NHTSA – Countermeasures That Work

This reference guide, used by State Highway Safety Offices, identifies effective, evidence-based countermeasures for traffic safety problem areas. These include many of the areas the IASWC studied in developing this SHSP. The guide summarizes strategies and countermeasures for the seven CEAs in this SHSP, as well as other safety concerns. In addition to major strategies, the guide addresses effectiveness, costs, and implementation time. The guide also points to important research summaries and individual studies regarding areas such as drug or alcohol impaired driving, seat belts and child restraints, aggressive driving, speeding, distracted and drowsy driving, motorcycle safety, young drivers, older drivers, pedestrians, and bicyclists.

AASHTO Highway Safety Manual (HSM)

This manual, published in 2010, provides management, planners, designers, operations, maintenance, and safety analysts with information and tools to develop a safer, more efficient roadway transportation system. The HSM allows for quantitative safety performance evaluation to help the above professionals with decision-making processes to identify possible improvements and their potential impact on safety and predict changes in the crash pattern or severity. This plan also allows agencies to focus on safety improvements with the highest potential for safety improvements in the most cost effective manner.

FHWA Handbook for Designing Roadways for the Aging Population

This reference guide is the 3rd edition, under a new title, of older driver specific design guidance. The handbook describes 51 proven or promising traffic control and design elements for improving safety for aging drivers and pedestrians. This guide explains how planners and designers select and document treatments with supportive evidence.

FHWA Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations

This reference guide was updated in 2018 and provides guidance to agencies on best practices for selecting countermeasures for improving pedestrian safety. This report assists State or local transportation or traffic safety departments with developing policies or guides to define the steps for installation of countermeasures at uncontrolled pedestrian crossing locations.

NDOT ADA Transition Plan

To meet the requirements of the Americans with Disabilities Act (ADA) that was enacted in 1990, NDOT developed a plan that evaluates the NDOT facilities and describes the methods to make the facilities accessible. The ADA transition plan outlines the schedule for taking the steps necessary to achieve compliance.

Links to the some of the above-mentioned documents are available on the NDOT website (see link below).

https://dot.nebraska.gov/safety/

3.2 Projections

The IASC has adopted a goal to reduce traffic fatalities per 100 million VMT from 1.122 (2016-2020 average fatality rate) to 0.90 fatalities by December 31, 2026. The IASC estimates that achieving this goal will save 138 or more lives over the next five years.

	2022	2023	2024	2025	2026	Total
Projected at current 1.122	249	251	254	257	260	1,271
Projected Reduction to 0.90	244	236	227	218	208	1,133
Lives Saved	**5**	**15**	**27**	**39**	**52**	**138**

Projections assume an annual increase of 244.3 million VMT and a projected trend to a fatality rate of 0.90 deaths per hundred million vehicle miles traveled by December 31, 2026.

Figure 8

The IASC has adopted a goal to reduce serious injuries per 100 million VMT from 6.916 (2016-2020 average fatality rate) to 5.5 serious injuries by December 31, 2026. The IASC estimates that achieving this goal will eliminate 1,181 serious injuries over the next five years.

	2022	2023	2024	2025	2026	Total
Projected at current 6.916	1,533	1,550	1,567	1,584	1,601	7,835
Projected Reduction to 5.5	1,387	1,359	1,332	1,303	1,273	6,654
Serious Injuries Eliminated	**146**	**191**	**235**	**281**	**328**	**1,181**

Projections assume an annual increase of 244.3 million VMT and a projected trend to a serious injury rate of 5.5 per hundred million vehicle miles traveled by December 31, 2026.

Figure 9

The IASC adopted a new goal to reduce non-motorist fatalities and serious injuries from 127 (2016-2020 average) to 110 fatalities and serious injuries by December 31, 2026.

	2022	2023	2024	2025	2026	Total
Projected at current 127	127	127	127	127	127	635
Projected Reduction to 110	121	119	116	113	110	578
Non-motorist Lives Saved and Serious Injuries Eliminated	**6**	**9**	**11**	**14**	**17**	**57**

Projections assume a projected trend to 110 non-motorist fatalities and serious injuries by December 31, 2026.

Figure 10

The process for the 2022-2026 SHSP focuses on using Nebraska's crash records to incorporate strategies most directly linked to the factors contributing to fatal and serious injury crashes. In addition, the IASWC and a wide variety of safety partners will continue to seek potential safety strategies for new and innovative ways to help achieve the state's overall goals. As a result, the final component of the Nebraska SHSP and the objective of this chapter will be to provide guidance on how to invest safety funds and resources among the critical strategies in order to offer insight on how to achieve these safety goals.

3.3 Implementing, Evaluating, Revising, and Reporting on the Nebraska SHSP

To guide implementation of HSIP projects and to maximize safety benefits, the IASWC will annually review fatal, serious injury, and visible injury crashes to determine if changes or additions to the CEAs in the SHSP are appropriate. If needed, they will forward their recommendations to the IASC's Leadership Committee for their review and approval. Additionally, NDOT will continue to work on implementing the Highway Safety Manual (HSM) methodology. As stated in the introduction to the manual, "The HSM introduces a science-based technical approach that takes the guesswork out of safety analyses. The HSM provides tools to conduct quantitative safety analyses, allowing for quantitative evaluation of safety alongside other transportation performance measures such as traffic operations, environmental impacts, and construction costs."

After the completion of the SHSP, the IASWC will continue to meet regularly to set priorities for and to oversee implementation of the safety program. IASC member agencies will select individual projects to further the goals of the SHSP and assign a responsible agency to each project. This agency will be responsible for implementation of the project, reporting on the progress of the project at future IASWC meetings, and, after the project is completed, performing an evaluation of the effectiveness of the project. NDOT will attempt to evaluate all HSIP projects chosen based on actual crash data. Evaluation results should help guide the committee in making future project decisions.

The majority of the CEAs and critical strategies identified in the Nebraska 2017-2021 SHSP appear to be relevant for the next five years. The stakeholder survey responses and review of safety improvement

nationally informed the addition of new and innovative strategies to the SHSP. The IASWC will continue to meet regularly to assess the critical strategies for opportunities to improve implementation of the safety program. The expectation is that no drastic changes in the highway safety problems identified will happen in the near term. In addition, time will be needed to implement the new projects identified, and to determine their effectiveness. The Interagency Safety Committee will periodically review the crash data to look for new safety initiatives.

The NDOT will report annually to FHWA on the HSIP. This will include types of projects initiated, funds expended, and evaluation results.

4. Key Conclusions

Zero is the only acceptable number of fatalities on Nebraska roads. Every strategy, every goal, and every statistic in this plan is focused on Nebraska's goal toward zero deaths. Safety is a shared responsibility among road users and road stewards. The Critical Emphasis Areas outlined in the Nebraska Strategic Highway Safety Plan are opportunities to take individual and agency action towards our shared goal of zero deaths on Nebraska roads. We can achieve this goal together.

Nebraska's 2022-2026 Strategic Highway Safety Plan was prepared in accordance with the FHWA guidance, using an analytical process driven by crash data. State safety partners representing enforcement, education, engineering, and emergency medical services participated in the entire process. The SHSP addresses the following three key items:

4.1 Statewide Safety Goals

The IASC has adopted a goal to reduce traffic fatalities per 100 million VMT from 1.122 (2016-2020 average fatality rate) to 0.90 fatalities by December 31, 2026. The IASC estimates that achieving this goal will save 138 or more lives over the next five years. The State's ultimate goal is toward zero deaths.

To align with Nebraska's annual safety performance measures, the IASC introduced two new goals for the 2022-2026 SHSP. Using a ten-year linear trendline, the IASC has adopted a new goal to reduce traffic serious injuries per 100 million VMT from 6.916 (2016-2020 average serious injury rate) to 5.5 serious injuries by December 31, 2026. The IASC estimates that achieving this goal will eliminate 1,181 serious injuries over the next five years.

In support of the longer term outlook of the annual non-motorist safety performance targets, the IASC adopted a new goal to reduce non-motorist fatalities and serious injuries from 127 (2016-2020 average) to 110 fatalities and serious injuries by December 31, 2026. These two new goals will provide a longer term planning vision for supporting all the annual safety performance measures.

4.2 Critical Emphasis Areas

Nebraska used crash records to identify the areas emphasized in the SHSP based on the number of related fatal and serious injury crashes. These CEAs represent the greatest opportunity for successfully reducing the number of traffic fatalities and serious injuries. The IASC then used the same screening process as in the 2017-2021 SHSP that ultimately resulted in the continuation of four areas, the modification of two areas, and the addition of one new CEA for the 2022-2026 SHSP.

Nebraska has made continuous progress toward reducing alcohol impaired driving. However, recently drug impaired driving has been on the rise. The IASC modified the alcohol impaired driving CEA to encompass both alcohol impairment and drug impairment due to the similarities of safety improvement techniques and strategies. The IASC also modified the roadway departures CEA to also include lane departure crashes. These two crash types have similar strategies and safety countermeasures that can reduce lane departure and roadway departure crashes at the same time.

Non-motorist fatalities and serious injuries have been increasing nationally recently. Though Nebraska has not experienced this same trend, the IASC proactively identified the need to directly support improving safety for the non-motorists. The creation of a new non-motorist CEA allows for a

more direct impact on the annual non-motorist safety performance measure. The Vulnerable Road User Assessment in Appendix A aligns with and expands upon the non-motorist CEA.

The CEAs for the 2022-2026 SHSP are:

1. Increasing Seat Belt Usage
2. Reducing Roadway/Lane Departure Crashes
3. Reducing Impaired Driving Crashes
4. Reducing Intersection Crashes
5. Reducing Young Driver Crashes
6. Reducing Older Driver Crashes
7. Reducing Non-Motorist Crashes

4.3 Development Strategies

The agencies within the IASC, as well as a wide variety of safety partners, will continue to look for potential new safety strategies and innovative ways to help achieve the state's overall goal of reducing traffic fatalities and serious injuries on Nebraska roadways. Individually and collectively, the agencies within the IASC will focus on projects that address each of the CEAs in a fiscally responsible way. Using crash data whenever possible, agencies will attempt to evaluate safety projects and initiatives on their success in helping reduce traffic fatalities and serious injuries. These plans will provide guidance on where and how to invest safety funds and resources in order to achieve the overall goal of the SHSP.

5. References

List of Acronyms

AARP	American Association of Retired Persons
AASHTO	American Association of Highway and Transportation Officials
ADA	Americans with Disabilities Act
ALR	Administrative License Revocation
ATC	Active Transportation Committee
BAC	Blood Alcohol Concentration
BUPD	Buckle Up Phone Down
CBC	Contributing Circumstance
CDC	Centers for Disease Control and Prevention
CDL	Commercial Driver's License
CEA	Critical Emphasis Area
CEQ	Council on Environmental Quality
CMV	Commercial Motor Vehicle
DHHS	Nebraska Department of Health and Human Services
DMS	Dynamic Message Signs
DMV	Nebraska Department of Motor Vehicles
DUI	Driving under the Influence (of alcohol or drugs)
EAF	Electronic Accident Form
EMS	Emergency Medical Services
EPA	Environmental Protection Agency
FARS	Fatality Analysis Reporting System
FAST	Fixing America's Surface Transportation Act
FHWA	Federal Highway Administration
FTA	Federal Transit Authority
FYA	Flashing Yellow Arrow
GPS	Global Positioning System
HLA	Hazardous Location Analysis
HPMS	Highway Performance Monitoring System
HRA	High-Risk Area
HRRRP	High Risk Rural Roads Program
HSIP	Highway Safety Improvement Program
HSM	AASHTO's Highway Safety Manual
HSO	Highway Safety Office
HSP	Highway Safety Plan
IASC	Interagency Safety Committee
IASWC	Interagency Safety Working Committee
IIJA	Infrastructure Investment and Jobs Act
ITS	Intelligent Transportation Systems
LRSP	Local Road Safety Plans
LTAP	Local Technical Assistance Program
LPI	Leading Pedestrian Interval
MAP-21	Moving Ahead for Progress in the 21st Century Act
MAPA	Metropolitan Area Planning Agency

MAPS	Metropolitan Aggressive and Prevention Selective
MIRE	Model Inventory of Roadway Elements
MMUCC	Model Minimum Uniform Crash Criteria
MPO	Metropolitan Planning Organization
NACO	Nebraska Association of County Officials
NCC	Nebraska Crime Commission
NCHRP	National Cooperative Highway Research Program
NDOT	Nebraska Department of Transportation
NEMSIS	National Emergency Management System Information System
NHHS	Nebraska Health and Human Services
NHTSA	National Highway Traffic Safety Administration
NSP	Nebraska State Patrol
NTIP	Nebraska Transportation Information Portal
OEHS	Office of Emergency Health Systems
PDO	Property Damage Only
RCUT	Restricted Crossing U-Turn
RHCP	Railroad Highway Crossing Program
ROR	Run-Off-the-Road
RRFB	Rectangular Rapid Flashing Beacon
RSDP	Roadway Safety Data Program
RST	Rider Skill Test
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SHSP	Strategic Highway Safety Plan
SSA	Safe Systems Approach
SVI	Social Vulnerability Index
TCD	Traffic Control Device
TIM	Traffic Incident Management
TraCS	Traffic and Crime Software
TRCC	Traffic Records Coordinating Committee
USDOT	U.S. Department of Transportation
VMT	Vehicle Miles Traveled
VRU	Vulnerable Road User

Appendix A:

Vulnerable Road User Assessment

NEBRASKA

Good Life. Great Journey.

TOWARD ZERO DEATHS — NEBRASKA —

APPENDIX A:
Strategic Highway Safety Plan Vulnerable Road User Assessment

NOVEMBER 2023

Table of Contents

1. Introduction and Background

The Nebraska Department of Transportation (NDOT) Vulnerable Road User (VRU) Assessment provides a quantitative analysis of statewide crash data involving vulnerable road users. This assessment is an appendix to the Nebraska Strategic Highway Safety Plan (SHSP) and synthesizes statewide crash data with land use, demographic, and roadway asset data to provide insights related to VRU safety. The terms vulnerable road user and non-motorist are used interchangeably in the SHSP and VRU Assessment. The assessment follows the Federal Highway Administration's (FHWA) Safe Systems Approach (SSA) and is a data-driven, systemic approach to develop strategies for reducing fatalities and serious injuries for VRU. The assessment provides further insight to trends of VRU crashes as compared to overall crashes, provides greater specificity as to areas with the greatest opportunities for improvement, and identifies strategies to reduce fatalities and serious injuries for VRU.

1.1 Connection to SHSP

Nebraska's current SHSP provides a depth of historical crash data and draws conclusions from the 2016-2020 calendar years. The VRU Assessment data analysis used the same 2016-2020 crash data. The SHSP identified reducing VRU crashes as one of its seven Critical Emphasis Areas (CEAs). VRUs account for 8% of all traffic fatalities and serious injuries in Nebraska. In the SHSP, the Interagency Safety Committee adopted a goal to reduce annual VRU fatalities and serious injuries from 120 to 110 by the end of 2026.

The SHSP discusses crashes involving VRUs on page 32 and 33 and identified six strategies for improving VRU safety.

- High Visibility Crosswalk Markings
- Rectangular Rapid Flashing Beacons
- Roundabouts
- Road Diets
- ADA Ramps & Curb Extensions
- Crosswalk Overhead Lighting

This assessment is an opportunity for further analysis to identify additional actionable strategies for reducing VRU crashes. The SHSP touches on some attributes (age, lighting conditions, location, contributing factors, time of day). This assessment will expand upon the SHSP work further by reviewing other factors relevant to VRU crashes such as the demographic data, land use data, hit and run crashes, traffic volumes, month of crash, and other data relevant to VRU crashes.

1.2 Safe Systems Approach (SSA)

The FHWA SSA is an effective process used to address traffic safety focusing on implementing highly effective strategies across an agency's footprint while acknowledging that reduction in traffic crashes is the shared responsibility of several stakeholders such as law enforcement, emergency services, engineers, vehicle manufacturers, and the individual user. The SSA identifies five focus areas as shown in **Figure 1**. These five focus areas are encompassed by the six safe system principles.

Viewing data through the SSA lens also provides opportunities to identify proactive safety improvements that can effectively reduce fatalities and serious injuries. A roundabout is a great example of a safe systems approach safety improvement. The roundabout adjusts how vehicles approach the intersection and reduces vehicle speeds to a level that when people make mistakes and a crash occurs, the human body can tolerate the energy in the crash, so death or serious injury don't occur. Recognizing that certain types of roadway crashes occur randomly along the length of the system, a proactive systemic approach to project implementation will be used. In these cases, the data may apply to the system as a whole and not to site specific projects. The systemic safety approach and demographic data help identify safety improvement opportunities without requiring a history of crashes at a specific location.

Source: FHWA.

Figure 1 – Safe Systems Approach Diagram

Another example of SSA is the implementation of leading pedestrian intervals, restricting right turns on red, or separated bike lanes to separate users in time and space. This multi-layer method of traffic safety follows the SSA, which has been successful in reducing fatalities and serious injuries across the U.S. and in other countries. NDOT plans to continue implementing the strategy of prevention, minimization, and mitigation of fatal and serious injury crashes on Nebraska roadways.

1.3 Description of the Process

This VRU Assessment was prepared in accordance with the requirements of the Infrastructure Investment and Jobs Act (IIJA) and in alignment with the SHSP. The VRU Assessment is an appendix to the SHSP, which provides the eligibility criteria for Highway Safety Improvement Program (HSIP) funds. The assessment was completed in the four steps noted below, as defined by the FHWA *Vulnerable Road User Safety Assessment Guidance* (October 2022). In following the SSA, the primary focus of the VRU Assessment will be on fatal and serious injury crashes, herein described as severe crashes.

VRU Safety Performance

Describe VRU crashes as related to all crashes and distinguish where VRU safety performance deviates from the overall dataset. The primary output in this step is to identify focus areas to carry into the Quantitative Analysis.

Quantitative Analysis

The FHWA guidance allows for several strategies by which a state DOT can accomplish this analysis. For consistency with the SHSP, this VRU Assessment follows a SSA approach by cross referencing several related focus areas to understand where High-Risk Areas (HRAs) exist that can help NDOT further refine their approach to solving the challenges of VRU crashes.

Stakeholder Consultation

NDOT engaged the public as the primary stakeholders as well as traditional roadway safety stakeholders such as AAA Nebraska, Nebraska Department of Health and Human Services, law enforcement, and Metropolitan Planning Organizations (MPOs). The goals of this step were to verify observations from users and practitioners compared to the conclusions being drawn from the data analysis, gather input on potential strategies, and discover strategies that have been the most successful in mitigating VRU crashes. With the national data showing higher VRU fatality rates for Native Americans, specific outreach was also conducted for tribal communities in Nebraska.

Identification of Strategies

Using the results of the previous steps which culminated in the identification of HRAs, a series of strategies built around countermeasures and best practices outlined in the SHSP and reference material from the SHSP were used to develop strategies to reduce severe VRU crashes in Nebraska.

1.4 Data Used

Nebraska crash data from 2016-2020 was used in this analysis to match the analysis time period of the SHSP. Over that period, there were 3,194 total VRU crashes and 617 fatal and serious injury VRU crashes in the state. Fatal and serious injury crashes are the focus of this analysis. In some cases, the dataset was expanded to include other injury or property damage only (PDO) crashes to discern trends in the data.

For this assessment, and as defined by FHWA guidance, VRU crashes are crashes involving a pedestrian or pedal cyclist. Note that federal guidance also includes other rolling modes such as scooters, however, it was assumed that this remains a low total of the crash data for the years included in this assessment or that these crashes would be coded as one of the two mentioned above.

The VRU Safety Assessment Guidance Memo also specifies that land use and demographic information be included in the assessment. These data sets were not previously used in the SHSP. Land use data sets were located from the following data sources:

- Parks (ParkServe): https://www.tpl.org/parkserve
- Public/Private/Post-Secondary Schools (National Center for Education Statistics): https://nces.ed.gov/programs/edge/geographic/schoollocations
- Cemeteries, Government Offices, Hospitals/Clinics, Libraries, Places of Worship, (ESRI USA Institutions): https://www.arcgis.com/home/item.html?id=007ff07891e34e339a6da82a5c44fd31
- Lincoln StarTran Transit Stops (City of Lincoln Public Works and Utilities Department): https://beta-lincolnne.opendata.arcgis.com/datasets/LincolnNE::startran-bus-stops/about

These were compiled in ArcGIS and provided to the analysis team as a single data set. This data was associated with crashes by creating buffers for each land use that were 0.1 miles (~500 feet) in radius. Then crash data were associated with these buffers and provided for analysis as tables.

For demographic data, the VRU Safety Assessment Guidance Memo recommended the following data sources:

- EJScreen: Environmental Justice Screening and Mapping Tool (EPA)
- FHWA – HEPGIS Maps: Socioeconomics and Equity Analysis (FHWA)
- Transportation Disadvantaged Census Tracts (arcgis.com) (USDOT)
- The Climate and Economic Justice Screening Tool (CEQ)
- Social Vulnerability Index (CDC)

NDOT has been piloting safety analysis using the demographic data from the Centers for Disease Control (CDC) Social Vulnerability Index (SVI). This index data set is readily available from the CDC and was created to help identify at risk populations to inform disaster response. The SVI includes demographic data, such as race, ethnicity, income, age, and disability, that can be used to proactively and equitably improve safety for underserved communities. Data are provided at the census tract level. The index is a percentile rank of the number of residents of that census tract that are considered high risk. The SVI data were associated with crashes using a similar process as the land use data. More information on SVI is provided in Section 2.3.2.

Several characteristics of VRU crashes were considered to discern patterns in their occurrence and therefore identify focus areas that would in turn be used to develop the list of High-Risk Areas (HRA).

VRU Crash Characteristics Considered

Who	When	Why	What	Where
Age of VRU	Time of Day	VRU CBC	Median Type	Facility Type
Gender	Year	Driver CBC	AADT	County
Social Vulnerability	Month of Year	Alcohol Related	Vehicle Body Type	Functional Class
	Day of Week	Lighting Condition	Speed Limit	Land Use
		Hit & Run	No. of Thru Lanes	Area Type

CBC = contributing circumstance
AADT = Average Annual Daily Traffic

2. VRU Safety Performance

The first step in addressing VRU crashes in Nebraska is to understand the context in which crashes occur among VRU as compared to all road users. Primarily, this task uses various factors affecting VRU crashes to draw comparisons between motorist and non-motorist (VRU) crashes. This will demonstrate the focus areas by which VRU crashes can be distinguished among the larger dataset and in turn define the HRA and strategies to mitigate them.

2.1 Historical Trends

Despite a historical decrease in traffic fatalities from a peak in the 1970s, data from the Fatality Analysis Reporting System (FARS) show the most recent ten years have seen an upward trend in fatalities nationally, including VRU fatalities as shown in **Figure 2**. A contributing factor to this fatality increase was the steady rise in vehicle miles traveled (VMT) throughout this period.

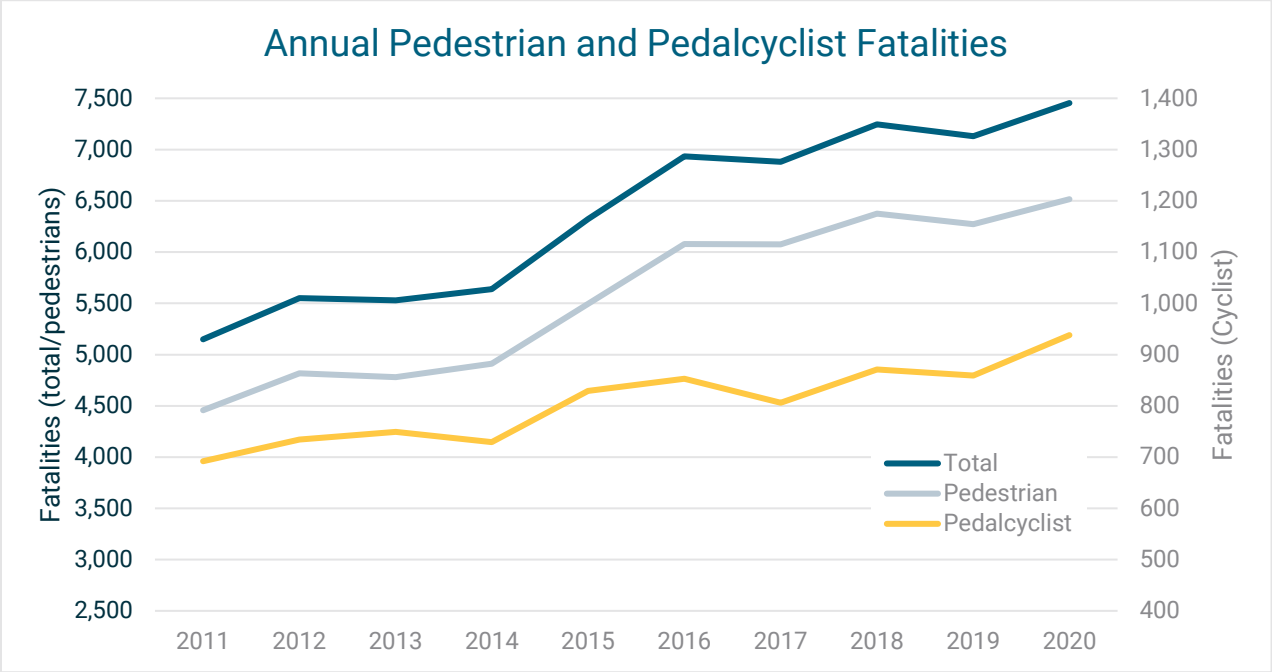


Figure 2

Data retrieved from the NHTSA FARS database.

The SHSP summarizes the trend in fatalities in Nebraska as increasing with the national trend. **Figure 3** below shows annual crash rates (expressed as crashes per hundred million vehicle miles traveled) in Nebraska between 2016 and 2020.

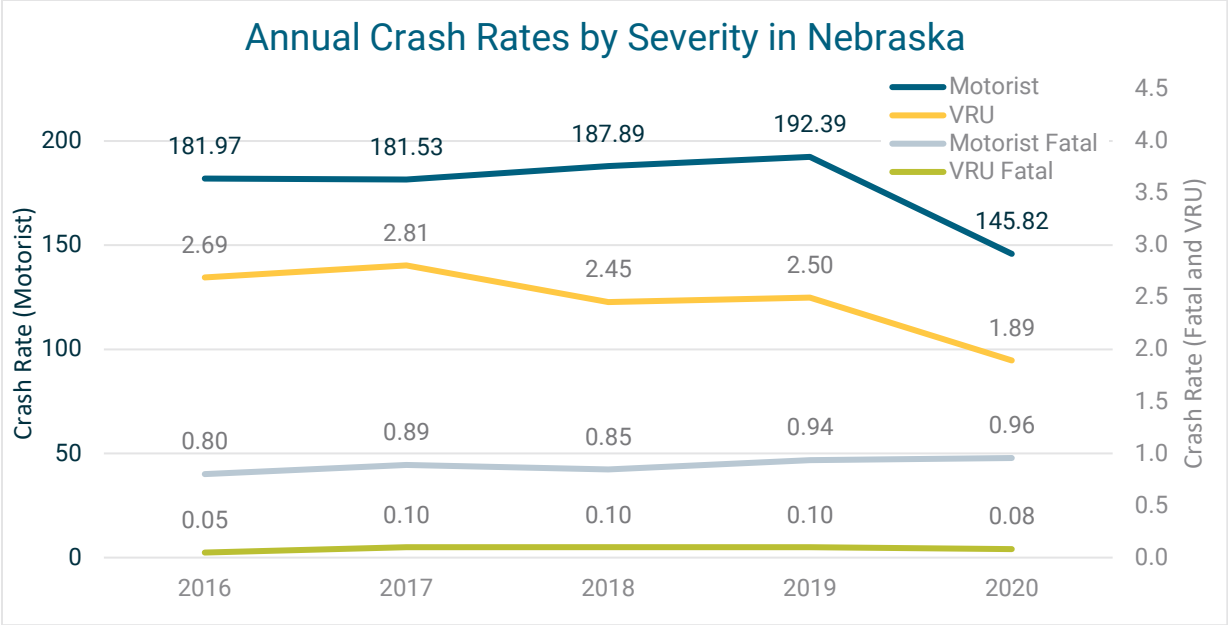


Figure 3

In this same time period, crashes involving VRU were more likely to result in injury or fatality than motorist crashes as shown in **Figure 4**.

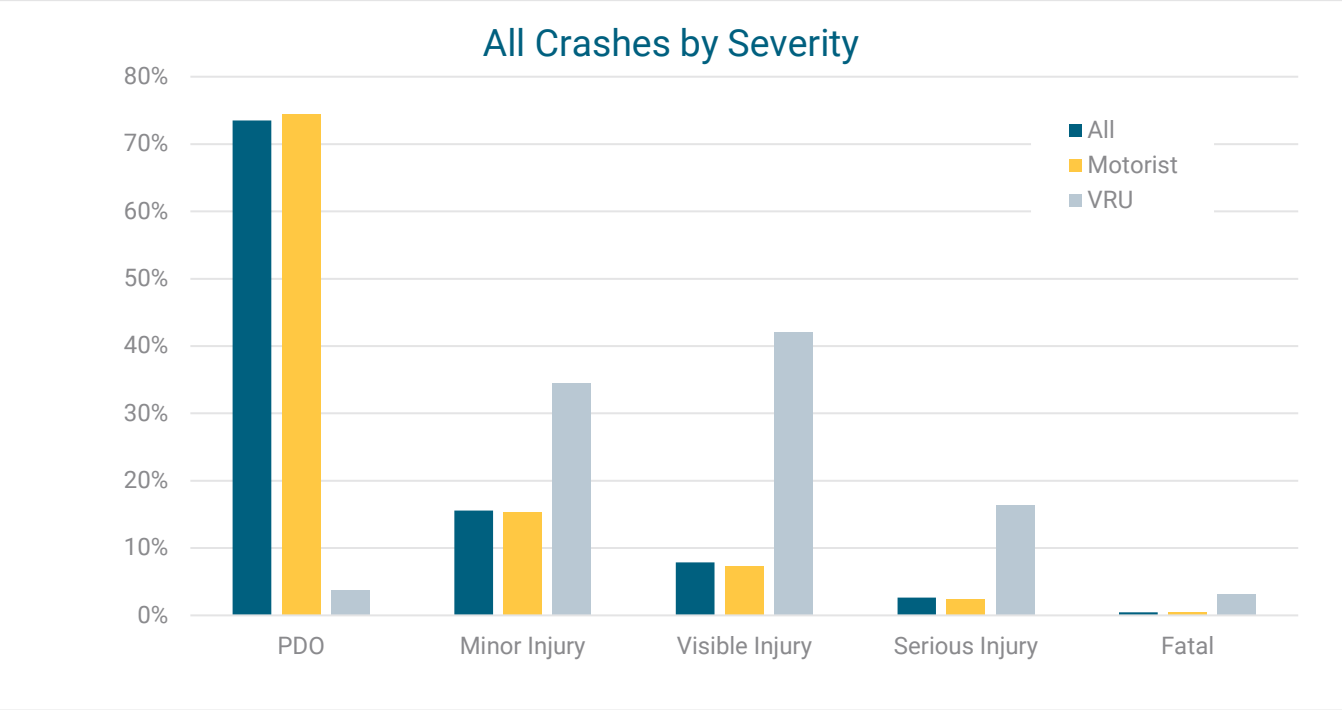


Figure 4

The crash data from 2016 to 2020 included over 200,000 crashes across Nebraska and was analyzed by various factors. The items identified for further analysis are performance by date and time, demographics, location, and relevant crash circumstances.

2.2 Performance by Date and Time

2.2.1 Month of Year

Figure 5 shows the crash data (all crash severities) is roughly equal month to month with between 7% and 9% of crashes occurring in each month. When only accounting for fatal and serious injury crashes, between 9% and 11% occurring in each month between June and October.

When further filtering for only VRU crashes, this trend continues with a high point of 13% of crashes occurring in September and a low point of 5% of crashes in February. The trend is similar when considering only VRU severe crashes; however, the data show a dip in August. These trends in monthly distribution of VRU crashes may be due to increased VRU activity around the summer months and the first part of the school year.

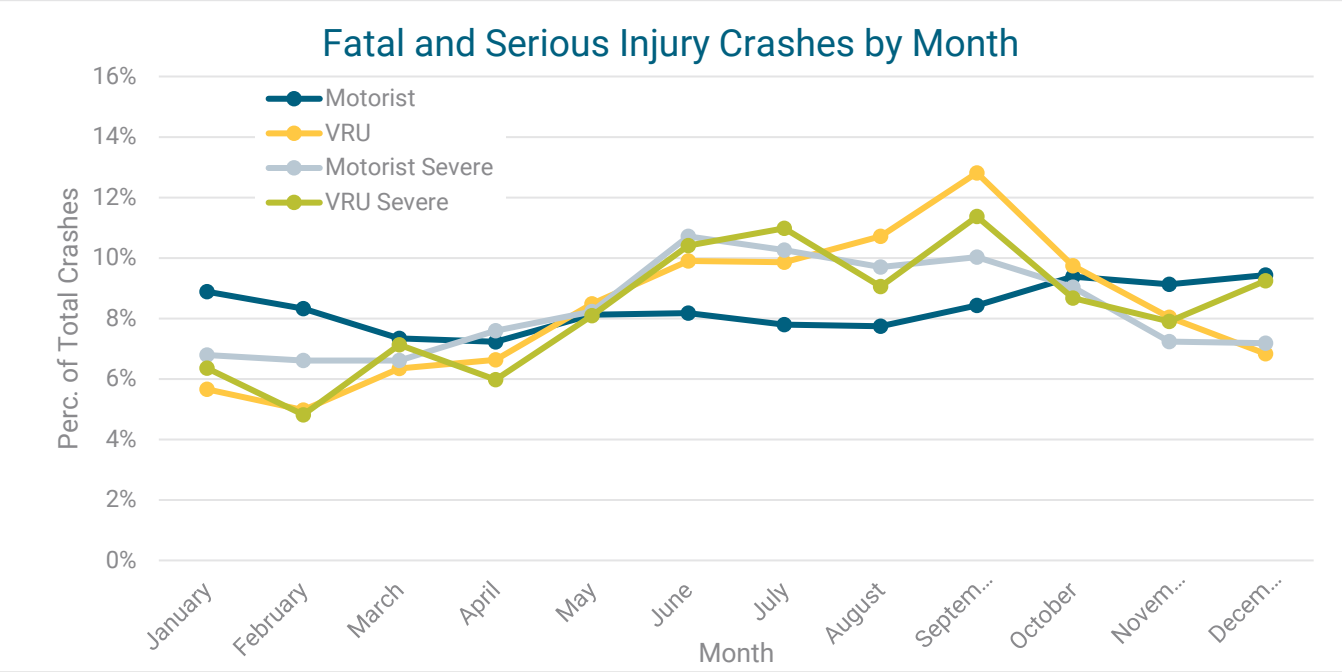


Figure 5

2.2.2 Time of Day

The time of day was broken into three-hour segments from midnight to 3:00AM, 3:00AM to 6:00AM, 6:00AM to 9:00AM, etc. The total crash count follows a trend of fewer crashes through the overnight hours 9:00PM-6:00AM, with a peak in the PM commute (3:00PM-6:00PM). The PM commute accounts for 24% of all crashes, 20% of fatal and serious injury crashes, and 21% of VRU fatal and serious injury crashes as shown in **Figure 6.** Severe VRU crashes are more common as compared to all VRU crashes in the evening and overnight time (6:00PM-6:00AM).

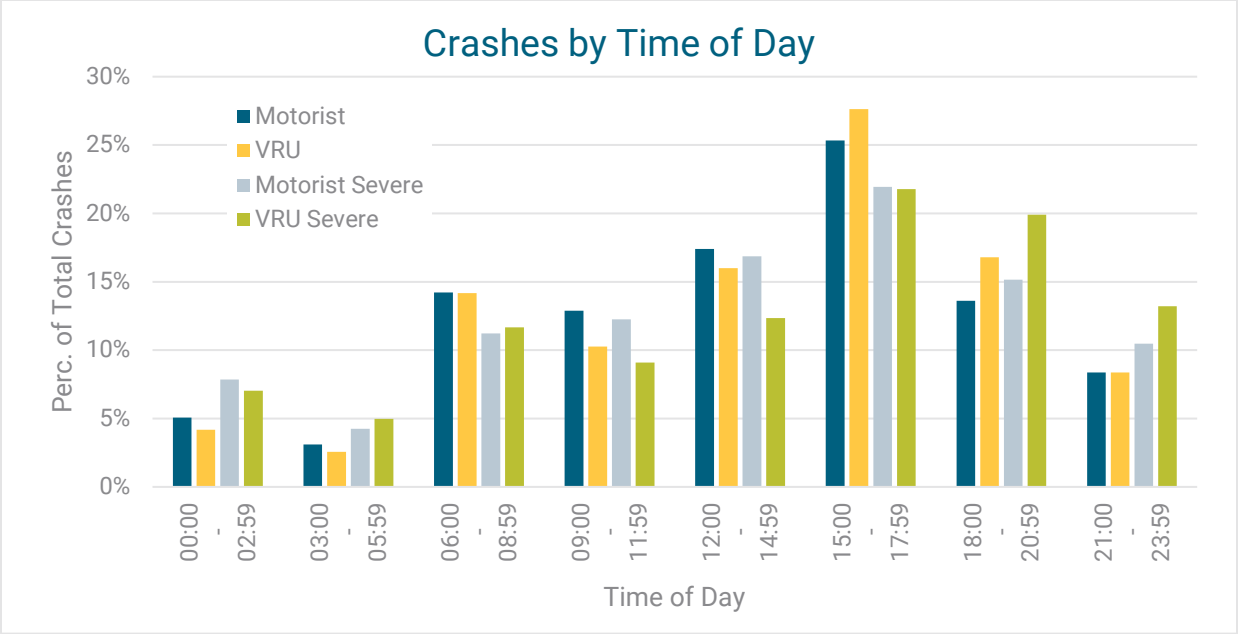


Figure 6

2.3 Performance by Demographics

2.3.1 Age

The age range with the highest percent of fatal and serious injury VRU crashes were people aged 15-24 (17%). The next closest ranges were under 15, 25-34, and 45-54 with the age range with the lowest percent of total crashes being 65+ (10%).

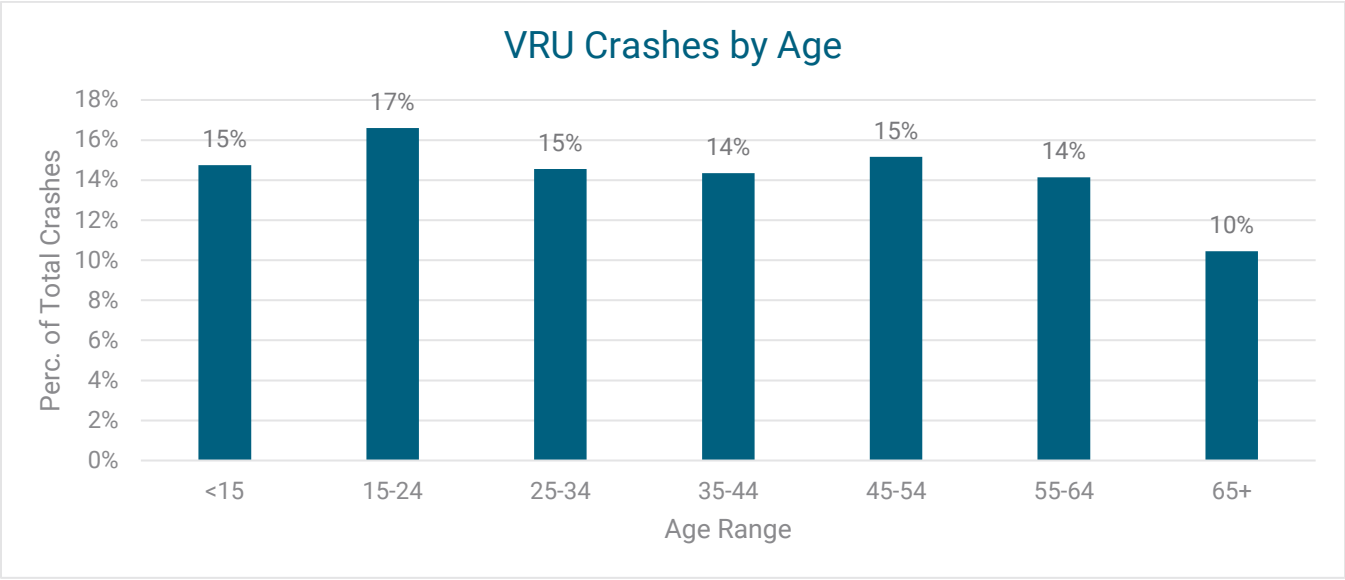


Figure 7

2.3.2 Social Vulnerability

The Social Vulnerability Index (SVI) is an index that refers to the resilience of communities when confronted by external stresses on human health, natural or human-caused disasters, and disease outbreaks. Factors within the index are socioeconomic status (below 150% poverty, unemployment, housing cost burden, no high school diploma, no health insurance), household composition (age over 65, age under 18, disability, single-parent household, English language proficiency), racial and ethnic minority status, and housing type/transportation (multi-unit structures, mobile homes, crowding, no vehicle, group quarters). More information on SVI can be found on the CDC website.

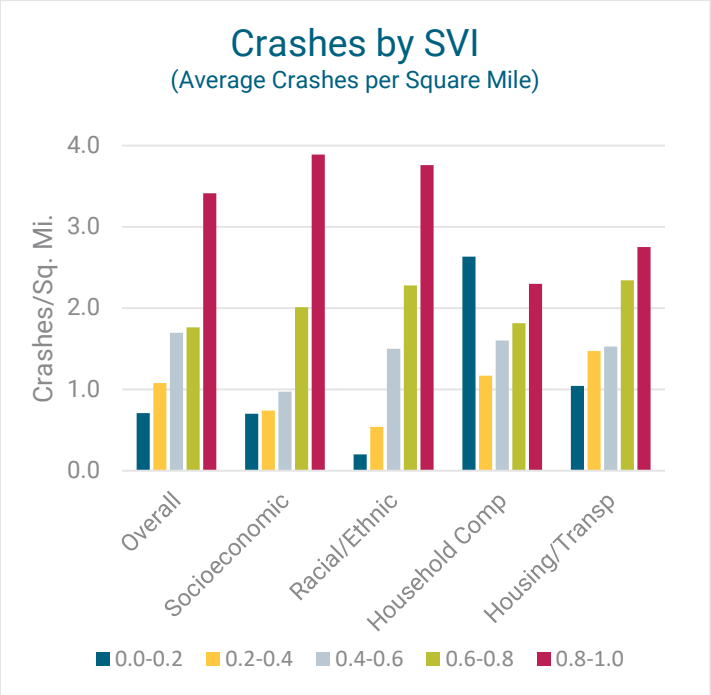


Figure 8

Across several SVI variables, the 2016-2020 crash data points to a higher number of fatal and serious injury crashes in communities that are higher on the racial/ethnic index, higher on the socioeconomic index (low income), and higher on the housing/transportation index. The household composition index showed a mixed trend. Each of these examples points to communities with residents that are more socially vulnerable and, as shown in the crash data, are more likely to be involved in a fatal or serious injury VRU crash.

The two strongest indicators of a higher frequency of severe VRU crashes appear to be the socioeconomic index and the racial/ethnic index with a clear upward trend in crashes as the percentile of vulnerable populations increase. Data were analyzed against the size of the census tracts as shown in **Figure 8**. These data were also analyzed against population density and the same trends were found to be true as demonstrated by **Figure 9**.

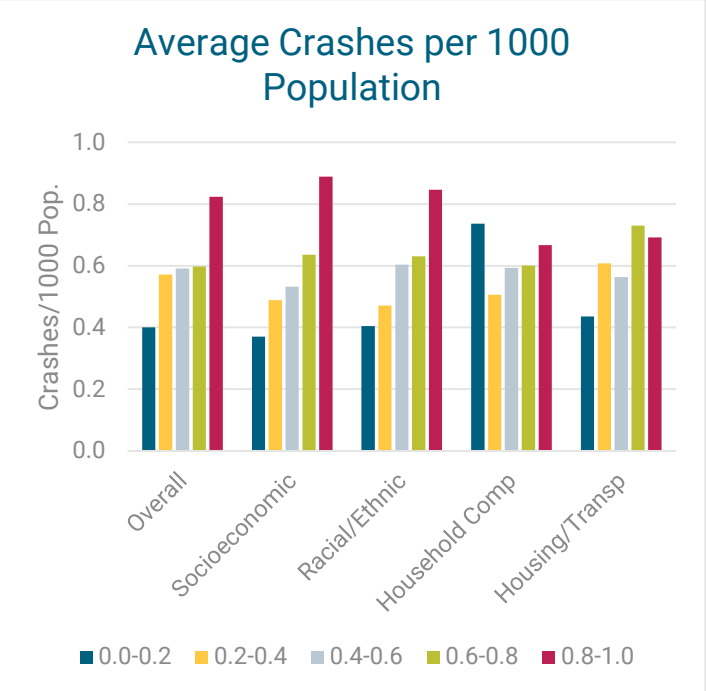


Figure 9

2.4 Performance by Location

2.4.1 Area Type

Nebraska has a variety of rural and urban settings across the state. Within the 2016-2020 crash data, patterns were identified between these settings. The raw crash data indicated that 78% of all crashes occurred in urban areas with 22% occurring in rural areas. Conversely motorist fatal and serious injury crashes are evenly distributed between urban and rural settings.

The data further indicates a trend when only analyzing VRU crashes. Of all VRU crashes occurring in Nebraska, 94% were in urban areas and 6% were in rural areas. Of the VRU fatal and serious injury crashes, 85% occurred in urban areas and 15% occurred in rural areas.

In Nebraska, urban areas provide greater safety improvement opportunities for both motorists and VRUs. At baseline, the percent of rural crashes doubles when comparing total crashes with fatal and serious injury crashes (22% to 50%) and (6% to 15%) for VRUs. So, while motorists and VRUs are much more likely to be involved in a crash in an urban setting, if involved in a rural crash, the chances of it being a fatal or serious injury crash double.

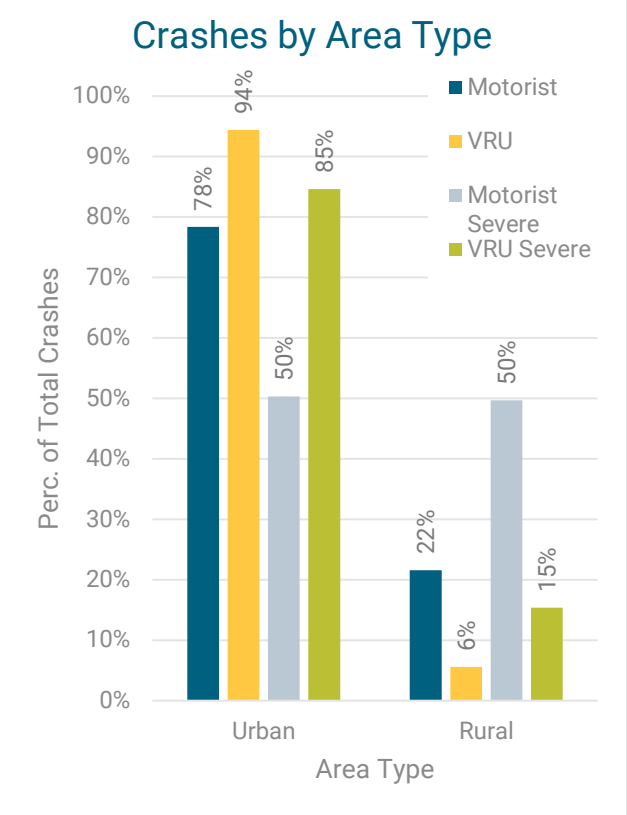


Figure 10

2.4.2 County

The county data supports the findings in the rural versus urban section above. Over half of Nebraska's population resides in three counties (Douglas, Lancaster, and Sarpy). The graph below summarizes crashes by county and as a percentage of total county crashes from 2016-2020 for the top 8 counties. Douglas County has the highest percentage of total crashes and highest percentage of VRU severe crashes. This is consistent with Douglas County's large densely populated metropolitan area. Lancaster County has a higher percentage of VRU crashes compared to the other crash types. The trend for less populated counties (Hall, Buffalo, Scottsbluff, Madison, and Dodge) is roughly even across the board between crash type and severity.

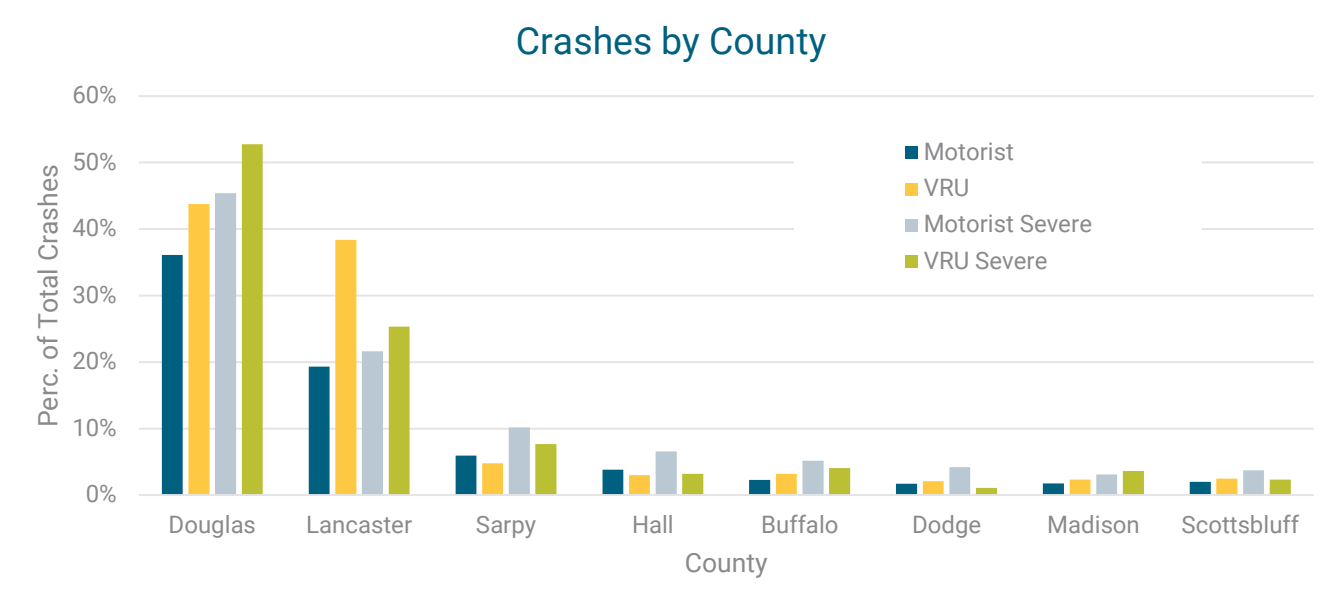


Figure 11

2.4.3 Land Use

The crash data was parsed into user characteristics including the land use where the crash occurred. The land use categories were cemeteries, government offices, social services, hospitals/clinics, libraries, parks, places of worship, colleges, private schools, public schools, and transit stops. The highest percentage of fatal and serious injury crashes involving VRUs occurred at transit stops (34%), parks (25%), and places of worship (19%). The land uses with the highest density of severe VRU crashes were social services (2.8), transit stops (2.3), and post-secondary schools (2.1).

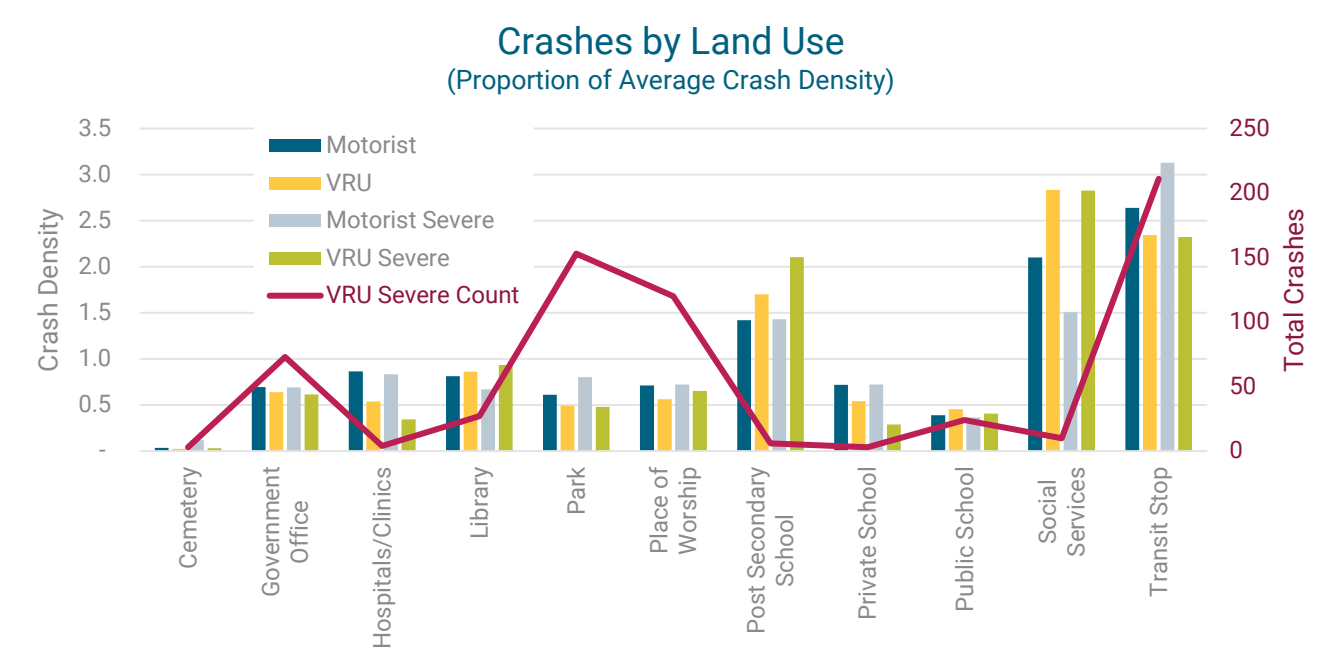


Figure 12

2.4.4 Functional Classification

Nebraska's roadways are consolidated into functional classifications based on the FHWA's roadway classification system. The hierarchy is: interstates, other freeways and expressways, other principal arterials, minor arterials, major and minor collectors, and local roads. Interstates operate at high speeds and focus on moving a large volume of motorists (without serving VRUs) whereas local roads operate at low speeds and focus on moving a small volume of motorists while also serving VRUs.

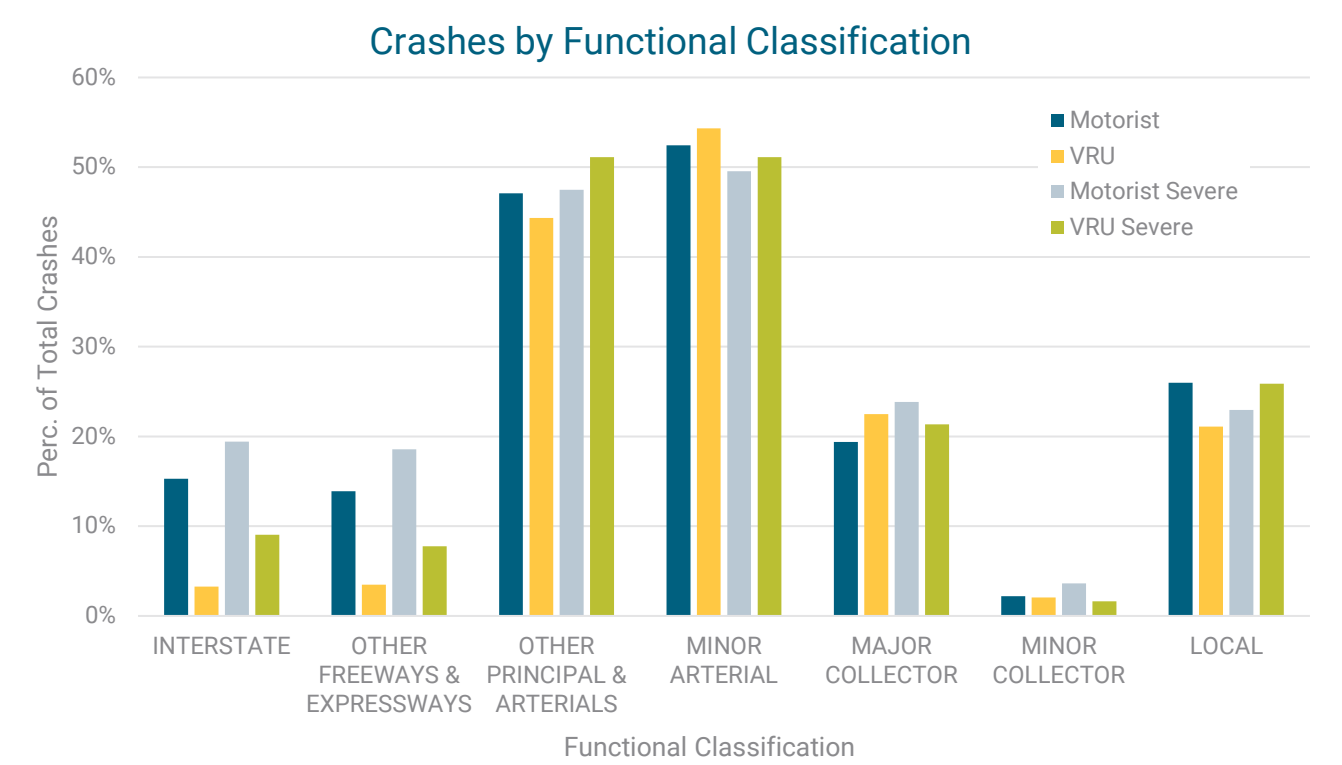


Figure 13

The highest proportion of crashes across these criteria were other principal arterials and minor arterials. The number of VRU fatal and serious injury crashes occurring on interstates and other freeway/expressways was lower than the percent of total crashes. The trend shows there are relatively fewer VRU severe crashes on access controlled higher speed roads (interstate and other freeway/expressway) and more VRU severe crashes on medium speed streets with more intersections (other principal arterials and minor arterials).

2.4.5 Intersection Type

Intersection type can be a factor in crash outcomes. **Figure 14** below shows the difference in crash occurrence between different intersection types. Most severe VRU crashes occur at non-intersection locations, and account for a higher percentage as compared to all VRU crashes. 4-leg intersections are the most common intersection crash location and the most common intersection type.

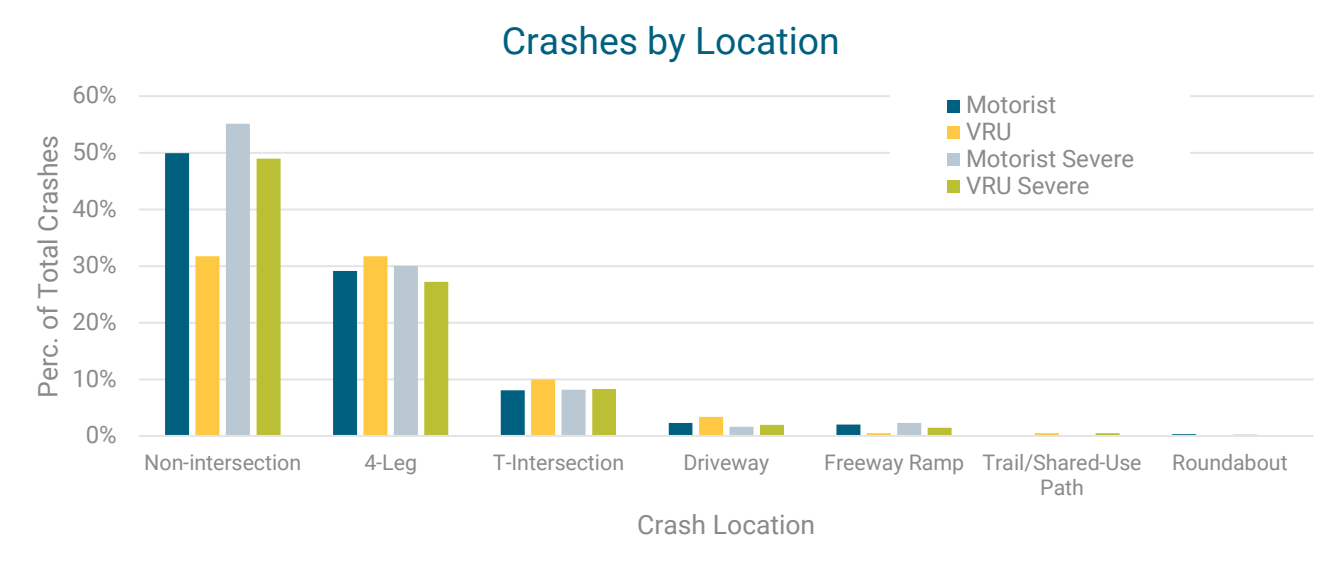


Figure 14

2.5 Performance by Crash Circumstances

Contributing factors are essential to review during crash data analysis to better understand the circumstances of each crash. Lighting, alcohol involvement, and hit and run were three factors identified as contributing to the crash outcome and can provide insight into the impacts on VRUs.

2.5.1 Driver Contributing Circumstance

Of the reports that captured driver contributing circumstances, Failure to Yield and Distracted Driving were most common while Reckless driving, Run off the Road, and Speed Related showed the greatest disparity between severe VRU crashes and all VRU crashes.

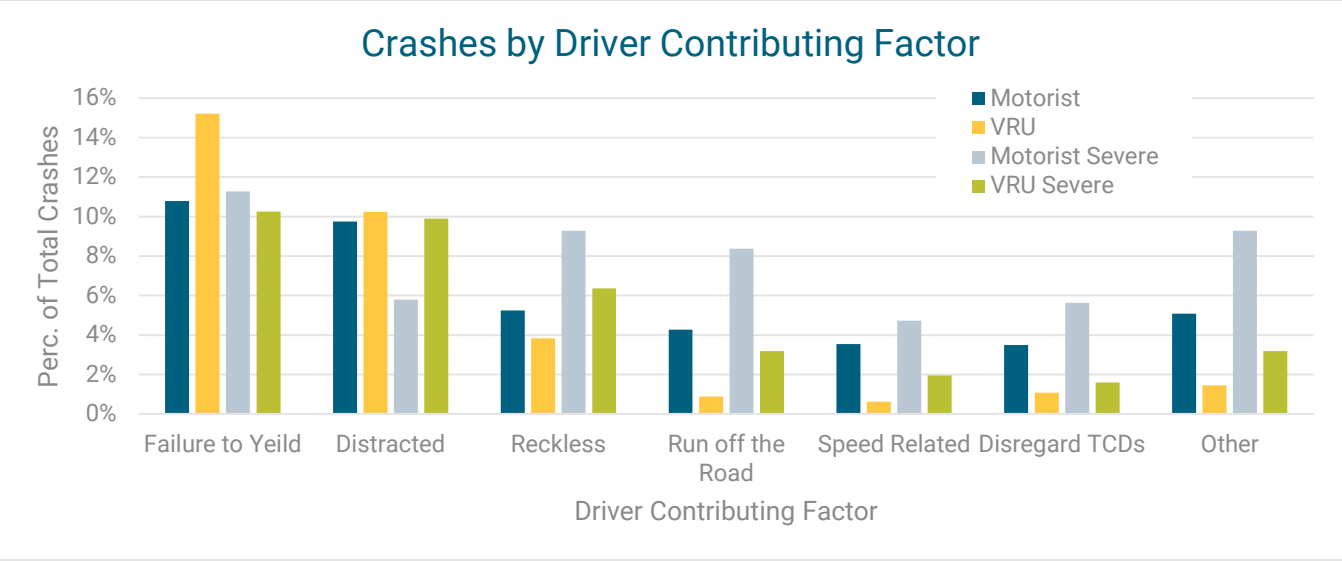


Figure 15

2.5.2 Non-Motorist Contributing Circumstance

For the reports that documented non-motorist contributing circumstances, Improper Crossing, Darting and Failure to Yield/Obey Traffic Control Devices (TCDs) are most common. Among these, Improper Crossing and Darting represent the non-motorist contributing circumstance where severe VRU crashes are a higher proportion of their total as compared to all VRU crashes. Improper Crossing is most common along arterial streets between 5PM and 8PM, whereas darting is most common along minor arterial streets and local roads between 3PM and 5PM. The latter also correlates to more crashes among pedestrians under 15 years old.

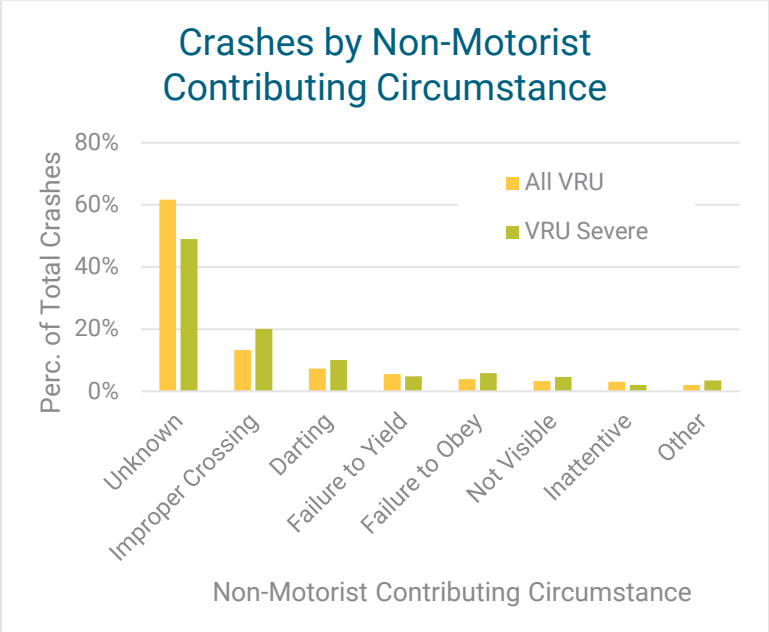


Figure 16

2.5.3 Lighting Condition

The lighting condition types were based on time of day (daylight, dawn, dusk, and dark) and if the roadway was lighted. Since most road users access the road network during daylight hours, it is not surprising that most crashes took place during daylight hours. **Figure 17** shows the national statistics on nighttime pedestrian fatalities from 2008-2018.

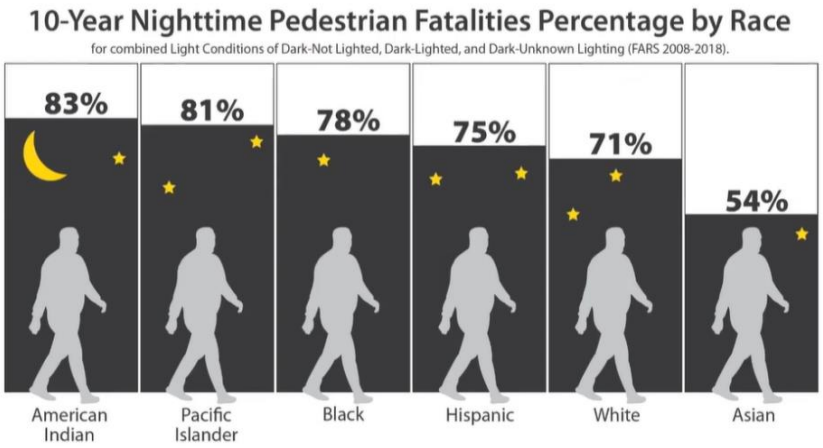


Figure 17

The dark (lighted) lighting condition is a safety improvement opportunity for VRU as both total VRU crashes and severe VRU crashes are more prevalent as compared to motorist crashes. Dark (lighted) severe VRU crashes are most prevalent in November and December, between 5 pm and 11 pm, along arterial streets. These crashes are most associated with reckless driving with 44% being related to this driver contributing circumstance.

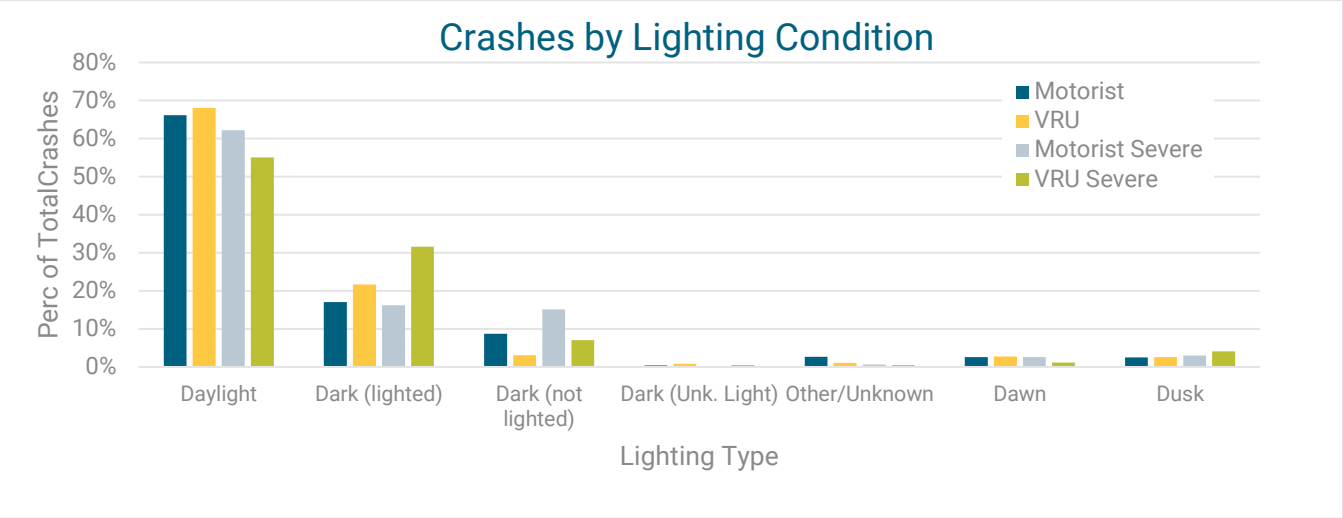


Figure 18

2.5.4 Alcohol Involvement

Most crashes do not involve alcohol; however, fatal and serious injury crashes have a greater proportion that involve alcohol. When reviewing VRU crashes, 6% of all VRU crashes involved alcohol. 17% of fatal and serious injury VRU crashes involved alcohol. For both motorist and VRU crashes, severe crashes are three to four times more likely to involve alcohol. Furthermore, alcohol related crashes for VRUs tend to be more prevalent on Saturday and Sunday and are more likely to be a Hit & Run (27%) as compared to all VRU crashes (18%).

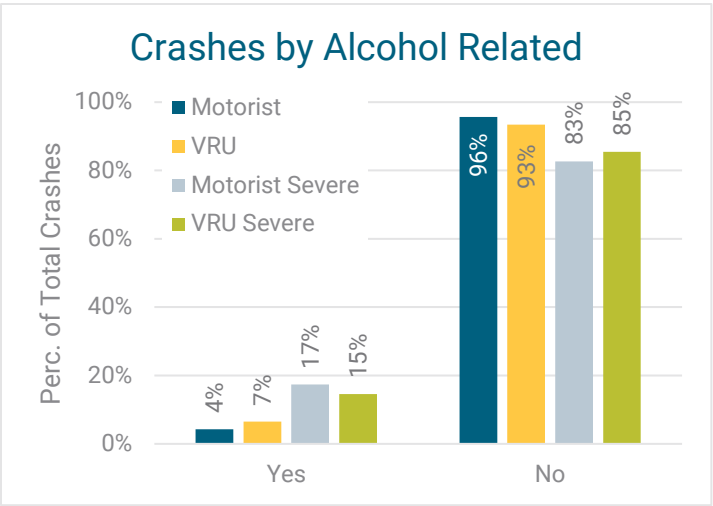


Figure 19

2.5.5 Hit & Run

The crash data from 2016-2020 indicates VRU crashes are more likely to be a Hit & Run compared to motorist crashes. Severe crashes are less likely to be a Hit & Run.

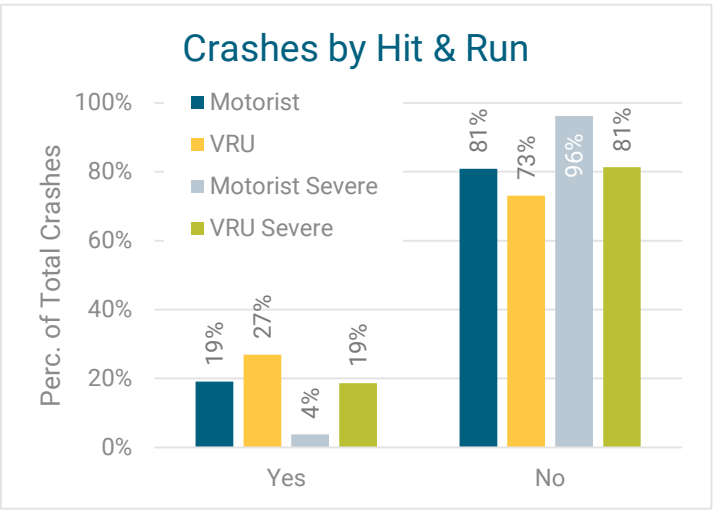


Figure 20

3. Quantitative Analysis

The final step before developing mitigation strategies is to identify the high-risk areas (HRAs) from which the selection of strategies can be grounded. These were developed by layering the demographics, date and time, location, and contributing circumstance data from the previous step to determine if there are combinations that provide greater opportunities for reducing severe VRU crashes.

Crash trees were primarily used to identify the HRAs. A crash tree diagram breaks down the crashes into progressively more detailed categories and helps focus on smaller groups of crash factors. A HRA can be a physical location or facility type, as well as a theme centered around trends in the data. In general, no more than three factors were considered or once a subset was below 10% of the overall severe VRU crashes. Where possible, the analysis controlled for related factors. For example, crashes along facilities were controlled against centerline miles and vehicle miles traveled (VMT).

The following categories were considered for this analysis:

Focus Areas for HRA Quantitative Analysis

Facility Type	Lighting	Land Use & Demographics	Contributing Circumstance
Area Type (Urban/Rural)	Lighting Condition	Land Use	Non-Motorist CBC
Functional Classification	Functional Classification	Socioeconomic Index	Age of Non-Motorist
AADT	Crash Location	Racial/Ethnic Index	Time of Day

CBC = contributing circumstance

3.1 Facility Type

Of the total severe VRU crashes, 62% occur on 5% of the centerline miles of Nebraska roads. These facilities only account for 20% of the vehicle miles traveled in Nebraska. A summary and further breakdown of these facilities is presented in the table below.

At least three of these categories have AADT ranges that would be under the capacity for that functional classification, suggesting generally free flow conditions and higher propensity for speeding. Trends among these crashes, based on the focus areas identified above, include the following:

Functional Classification to VRU Quantitative Analysis

Area	Nat. Func. Class	Average Daily Traffic	VRU Severe Crash Rate[1,2]	Annual VMT[2]		Severe Crashes	
				Total (1 mil)	Pctg	Total	Pctg
Urban	Minor Arterial	0 – 10,000	5.94	1,447	3.4%	86	13.9%
Urban	Other Princ. & Arterials	20,000 – 30,000	8.59	699	1.6%	60	9.7%
Urban	Major Collector	0 – 10,000	2.29	2,536	6.0%	58	9.4%
Urban	Other Princ. & Arterials	10,000 – 20,000	7.35	667	1.6%	49	7.9%
Urban	Local	0 – 10,000	5.18	947	2.2%	49	7.9%
Urban	Minor Arterial	10,000 – 20,000	4.90	920	2.2%	45	7.3%

1. Crash rate expressed as crashes per hundred million VMT.
2. VMT is estimated by centerline miles of road segments in that category times an average AADT of facility type.

Urban Minor Arterials (0-10,000)

- 16 crashes (10% of severe VRU crashes) occurred on 2-lane undivided streets
- Most common driver contributing circumstance is failure to yield (14 crashes)
- Most common non-motorist contributing circumstance is improper crossing (17 crashes)

Urban Principal Arterials (20,000-30,000)

- 49 crashes (8% of severe VRU crashes) occurred on 4-lane undivided streets
- Most common non-motorist contributing circumstance is improper crossing (20 crashes)

Urban Major Collectors (0-10,000)

- 22 crashes occur near either a park or transit stop

Urban Principal Arterials (10,000-20,000)

- 38 crashes (6% of severe VRU crashes) occurred on four-lane streets
- 22 crashes (4% of severe VRU crashes) occurred within 500 feet of a transit stop

Urban Local (0-10,000)

- 18 crashes are pedestrians under 15 years old

Urban Minor Arterials (10,000-20,000)

- 19 crashes occur near either a park or transit stop

If considering only rural facilities, Minor Arterial Streets under 10,000 vehicles per day show the greatest disparity with only 6% of rural VMT accounting for 23% of rural severe VRU crashes.

3.2 Lighting Condition

Lighting condition is a factor in crashes nationwide. As shown in the table below, VRU crashes in Nebraska demonstrate this trend with these four conditions representing 29% (176) of severe VRU crashes. Correlating focus areas include functional classification and crash location.

Lighting Condition to VRU Quantitative Analysis

Lighting Condition	Nat. Func. Class	Location	Severe Crashes		
			Total	Pctg (dark-lighted)[1]	Pctg (VRU Sev.)[2]
Dark (Lighted)	Minor Arterial	Non-Intersection	57	23.4%	9.2%
Dark (Lighted)	Other Princ. & Arterials	Non-Intersection	49	20.1%	7.9%
Dark (Lighted)	Other Princ. & Arterials	4-Leg	48	19.7%	7.8%
Dark (Lighted)	Minor Arterial	4-Leg	35	14.3%	5.7%

1. Compared to total dark (lighted), severe VRU crashes of 244.
2. Compared to total severe VRU crashes of 599.

Trends among these crashes, based on the focus areas identified above include the following:

Non-Intersection Locations along Arterials

- 50% of dark(lighted) (26 crashes) occur in the winter months, likely related to higher exposure with dark hours extending into commute times
- Primary non-motorist contributing circumstance is improper crossing (30 crashes)
- Arterials with 20,000-30,000 AADT saw the highest percentage of severe VRU crashes

4-Leg Intersection Locations along Arterials

- 15 crashes (33% of dark(lighted)) occur in the months of October and November, likely related to higher exposure with dark hours extending into commute times
- 31 crashes (13% of dark(lighted)) occur at Transit Stops
- Arterials with 0-20,000 AADT saw the highest percentage of severe VRU crashes

3.3 Land Use and Demographics

Land use and demographics were found to have a correlation regarding the frequency of severe VRU crashes. Severe VRU crashes were summarized with an emphasis placed on the census tracts with percentile ranks above 0.8 as those were found to be a focus area. Similarly, crashes occurring near transit stops, parks, social services, and schools were a focus area. The table below summarizes the correlation between the two focus areas, showing a total of 153 severe VRU crashes (26%). These occurred in less than 1% of the total area and 20% of the population encompassed by census tracts with severe VRU crashes.

Among the SVI indices, all factors within the Socioeconomic Status and Racial & Ethnic Minority Status indices ranked among the strongest correlations between higher vulnerability (0.8 – 1.0) census tracts and crash occurrence. While the Housing Type & Transportation and Household Characteristics indices did not show as strong a correlation, individual factors within them did. The categories of Limited English Proficiency, No-Vehicle Households, and Crowding showed strong correlation.

Land Use to VRU Quantitative Analysis

Land Use	Socioeconomic Index	Racial/Ethnic Index	Total Area[1]	Total Pop.[1]	Severe Crashes
Transit Stop	0.8-1.0	0.8-1.0	34.5 sq. mi. (0.32%)	136k (9.4%)	91 (15.2%)
Park	0.8-1.0	0.8-1.0	29.6 sq. mi. (0.27%)	94.7k (6.5%)	46 (7.7%)
Social Services[2]	0.8-1.0	0.8-1.0	9.32 sq. mi. (0.09%)	15.0k (1.0%)	6 (1.0%)
Post Secondary Schools[2]	0.8-1.0	0.8-1.0	0.4 sq. mi. (nom.)	3.9k (0.3%)	1 (0.2%)
Public and Private Schools[2]	0.8-1.0	0.8-1.0	9.8 sq. mi. (0.09%)	36.7k (2.50%)	9 (1.5%)

1. Total area or population of the census tracts with severe VRU crashes.
2. Totals provided as these were shown to have a disproportionate number of crashes as compared to other land uses.

Transit Stops

- Severe VRU crashes around transit stops are more common (82 crashes) on Principal Arterials with 10,000-30,000 AADT and a posted speed of 30-40 mph.
- 97 severe VRU crashes (46% of severe VRU crashes near transit stops), occurred under dark (lighted) conditions. Dark (lighted) conditions account for 30% of all severe VRU crashes.
- Severe VRU crashes are most common for age ranges are 35-44 and 45-54. These are 32% of the subset as compared to 24% of all severe VRU crashes.

Parks

- 56 severe VRU crashes, 35% of the subset occurred under dark (lighted) conditions. Dark (lighted) conditions account for 30% of all severe VRU crashes.
- Most common for age ranges are 16-24 and 25-34. These are 44% of the subset as compared to 38% of all severe VRU crashes.

Social Services

- Most common for age ranges are 16-24 and 25-34. These are 48% of the subset as compared to 38% of all severe VRU crashes.

Schools (Post Secondary, Public, Private)

- Combined, these account for 33 severe VRU crashes, 10 of which are in the SVI tracts discussed above.
- When considering Public and Private (primary and secondary) schools for all VRU crashes, 35% of crashes are pedestrians or cyclists under 15 years old and 26% are between 15 and 24 years old.

3.4 Non-Motorist Contributing Circumstance

Non-motorist contributing circumstance demonstrated correlation with VRU age and time of day. Specifically, when isolating for the most common non-motorist contributing circumstances, differences in the proportion of crashes by age and by time of day appear. These are summarized in the table below.

Cont. Circum.	VRU Age Ranges	Time of Day	Crashes
Darting	<15	15:00 to 17:59	47
Improper Crossing	<15	15:00 to 17:59	37
Darting	<15	18:00 to 20:59	24

This HRA is based on all VRU crashes due the need for a larger data set and the limited number of crashes that are spread across several potential non-motorist contributing circumstances.

Among all HRA summarized above:

- Nearly all (106 out 108 VRU crashes) occurred in an urban area.
- 61 crashes are visible injury crashes.

4. Stakeholder Consultation

4.1 Public Stakeholder Meeting

NDOT held an open house meeting for public stakeholders on August 8, 2023, from 5:00-7:00 pm at the NDOT Auditorium, 1500 Nebraska Parkway in Lincoln to share information about the VRU Assessment and gather feedback to include in the VRU Assessment. Email notifications about the open house meeting were sent to previous participants in the SHSP development, the NDOT Complete Street Policy stakeholder list, and contacts for Nebraska's tribal communities. In addition, NDOT distributed a press release about the project open house meeting and survey and shared the information on NDOT's Twitter and Facebook accounts.

The meeting format included a brief presentation by NDOT to provide a project overview including the VRU definition, goals of the assessment, and its connection to the overarching SHSP goals and plan. Current crash data and several mitigation strategies that have been successful in other places were also presented prior to asking for attendees' participation in the subsequent small group discussions and online survey. The presentation wrapped up with how the input will be used in the VRU Assessment and incorporated into the current SHSP. The presentation slides were shared on NDOT's SHSP website.

The presentation was followed by small-group topical discussions with project team members focused on barriers and safety concerns encountered by VRUs and typical destinations VRUs currently travel to and destinations that they currently cannot get to by walking, biking, or rolling. Attendees also provided input where educational efforts could be focused and their familiarity with current safety initiatives and approaches. Each station was staffed with project team members to share information, answer questions, and provide guidance as to how to give input using sticky notes and sticky dots.

4.2 Tribal Community Meetings

To further NDOT's commitment to engage Nebraska's tribal communities, four separate workshop sessions were offered for tribes headquartered in Nebraska on August 9 and 10, 2023. Invitation emails were sent to each of the tribes' leadership and / or NDOT contacts. Due to scheduling conflicts or lack of interest, the schedule was modified to one session on August 10 from 10:00AM – 12:00PM with the Winnebago Tribe of Nebraska. The meeting was held at the South Sioux City Marriott Riverfront, 385 E. 4th Street in South Sioux City. Representatives from NDOT, FHWA, Winnebago Tribe, and the consultant team were present.

NDOT shared a similar slide presentation as was given at the public stakeholder meeting. The presentation was followed by a roundtable discussion of safety concerns, barriers to destinations, and possible safety improvement countermeasures. Additionally, the tribal members shared several roadway, trail, and development projects that are planned or currently underway. The posters with public input from the public stakeholder meeting were also available for reference and discussion prompts. Attendees did not add their input to the posters, rather input was gathered in a roundtable discussion format.

4.3 Public Survey

As a statewide assessment, a survey tool was developed to broaden the reach of project information and opportunity for public input across Nebraska. Announcements for the survey were included in the joint media release for the public stakeholder meeting, in email invitations to stakeholders and tribal communities, and on NDOT's Twitter and Facebook accounts.

The survey, which received 563 responses, included a brief project introduction and overview of the survey. The results of the survey were used to inform the safety strategies and countermeasures included in the VRU Assessment. Of the 563 responses, 71% identified themselves as a VRU and an additional 5% represented a safety interest or advocacy group. 17% of the respondents identified as traditional safety stakeholders in the enforcement, education, engineering, and emergency medical services professions.

Responses were received from 43 zip codes across the state with the highest concentrations being in more urban areas or rural areas with established biking communities and infrastructure.

Figure 21 - Respondent Count by Zip Code

4.4 Meeting and Survey Results

The VRU Assessment Survey questions were written with consideration to the goals of the VRU Assessment to develop strategies to mitigate VRU crashes and to identify High-Risk Areas to apply the proactive safety strategies for reducing VRU fatalities and serious injuries. The survey results were condensed into four categories: land use, infrastructure, education, and general themes.

4.4.1 Education

The education themed survey questions focused on two main points: familiarity with traffic safety initiatives and focus for safety education. Related to questions about traffic safety initiatives, 32% were familiar with the Towards Zero Deaths Initiative; 41% were familiar with the Vision Zero Initiative; and 22% were familiar with the Safe Systems Approach. **Figure 22** shows respondents input for where to focus education efforts, which overwhelmingly favored driver education. Support for drivers' education programs was a strategy that received attention during the public meetings.

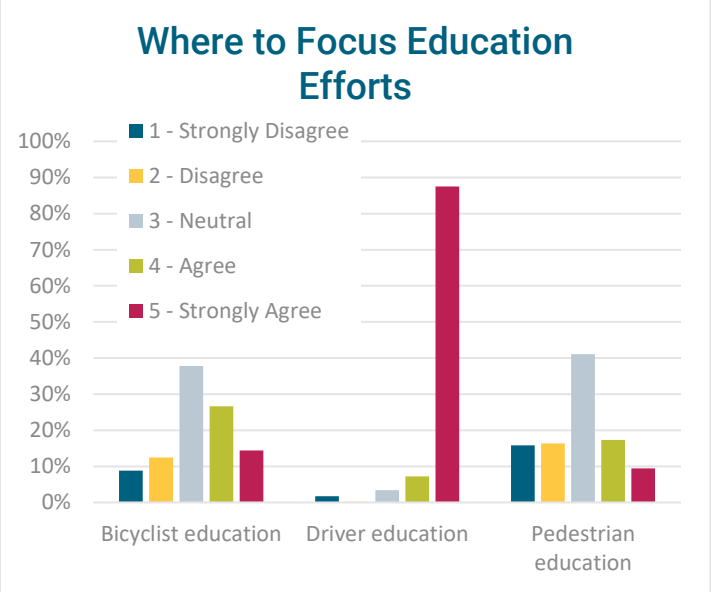


Figure 22

4.4.2 Land Use

The primary focus of the land use themed survey questions was on trip destination. As VRUs, the highest percentage of respondents said their typical destination was recreation (96%), shopping (52%), work (52%), and entertainment (43%).

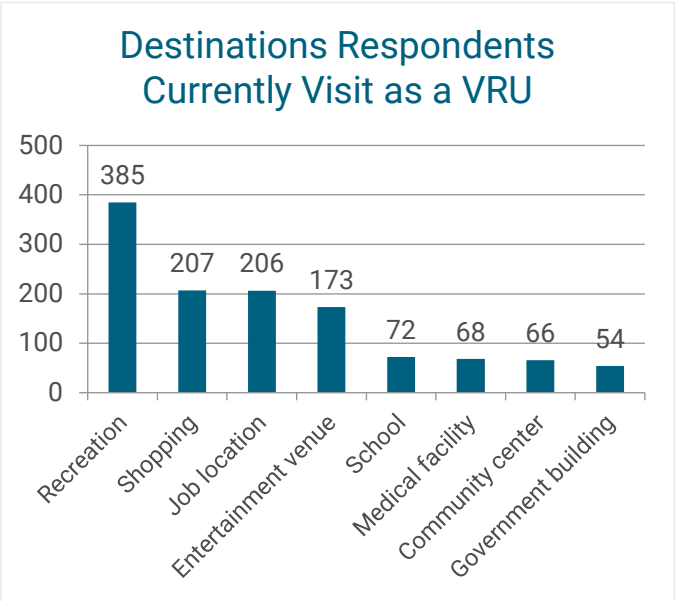


Figure 23

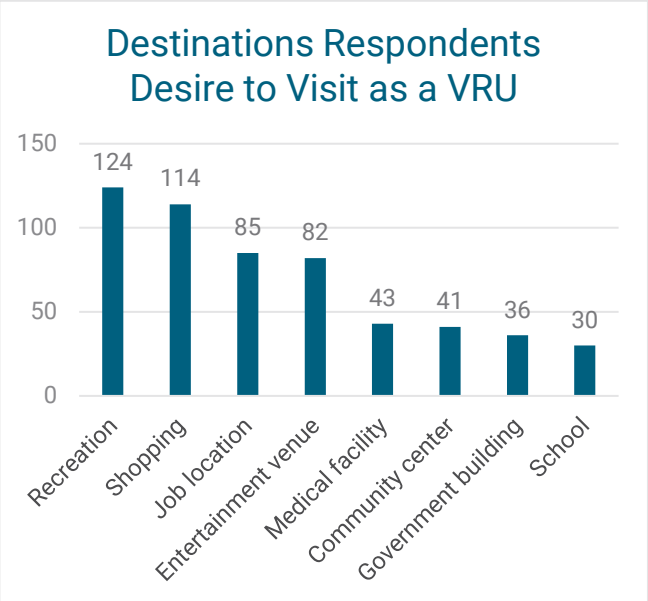


Figure 24

4.4.3 Infrastructure

The infrastructure themed questions reviewed safety measures and current critical emphasis strategies as they pertain to pedestrians and cyclists. In terms of facility type, pedestrians felt most comfortable with a dedicated 5-10' sidewalk whereas cyclists felt most comfortable with an on-street bicycle lane (separated by vertical barriers). Cyclists were least comfortable with on-street bicycle lanes with no separation. Respondents view roundabouts, ADA curb ramps/extensions, and overhead lighting as the most effective strategies listed in the SHSP for improving VRU safety.

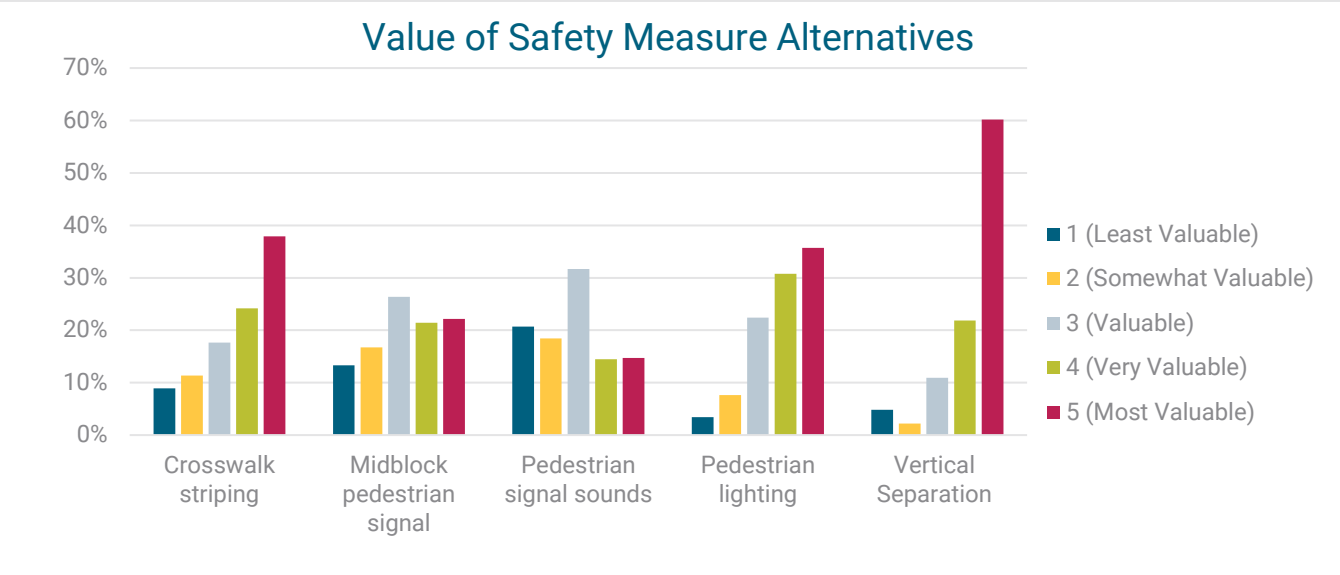


Figure 25

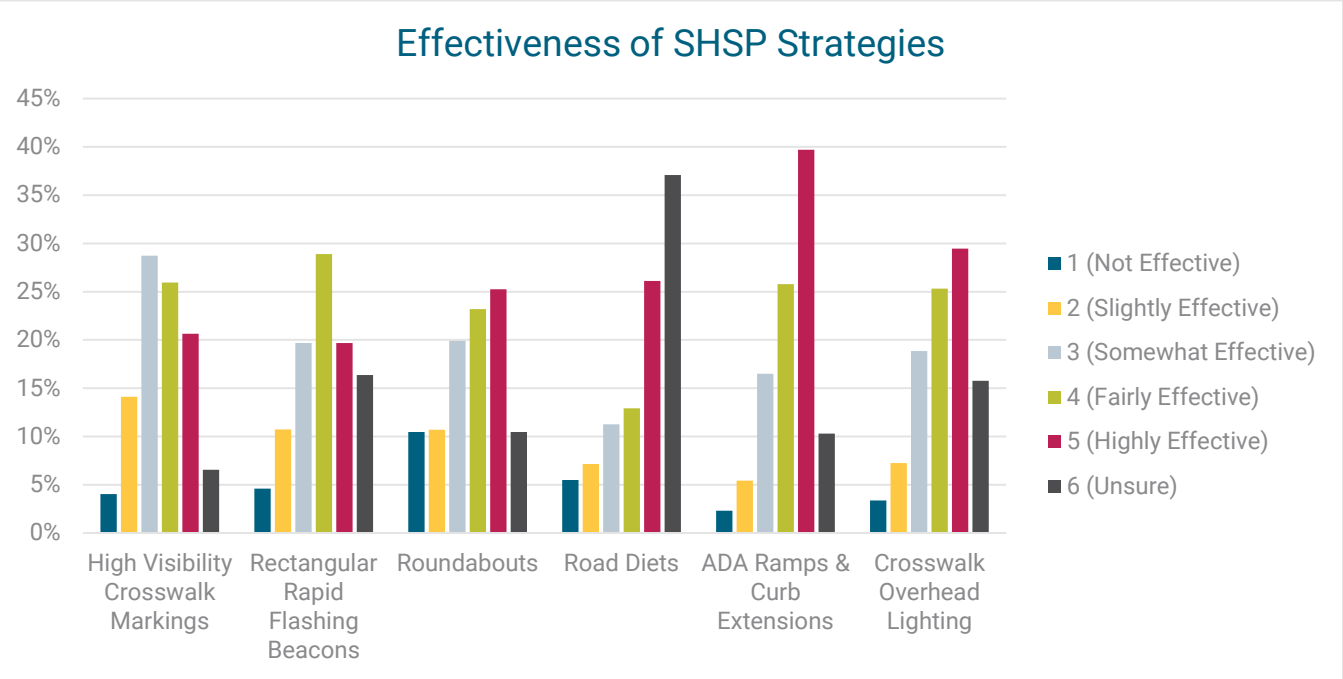


Figure 26

4.4.4 VRU Experience

The remaining survey questions discussed past experiences as a VRU and future hopes for VRU safety improvements. To identify barriers to active transportation, survey participants selected the three most common VRU barriers as shown in **Figure 27**.

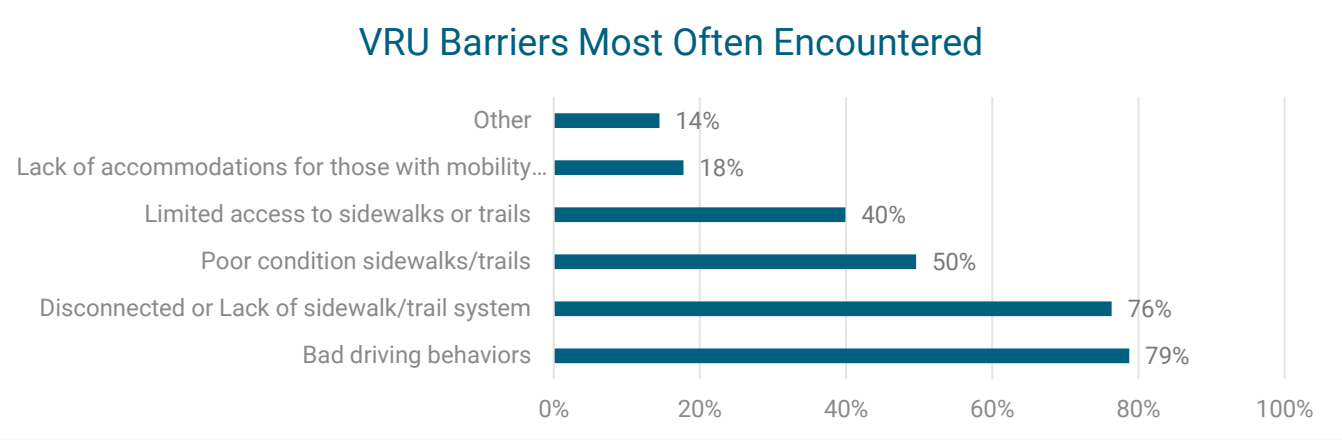


Figure 27

Furthermore, survey participants selected what VRU safety concerns they had experienced as shown in **Figure 28**.

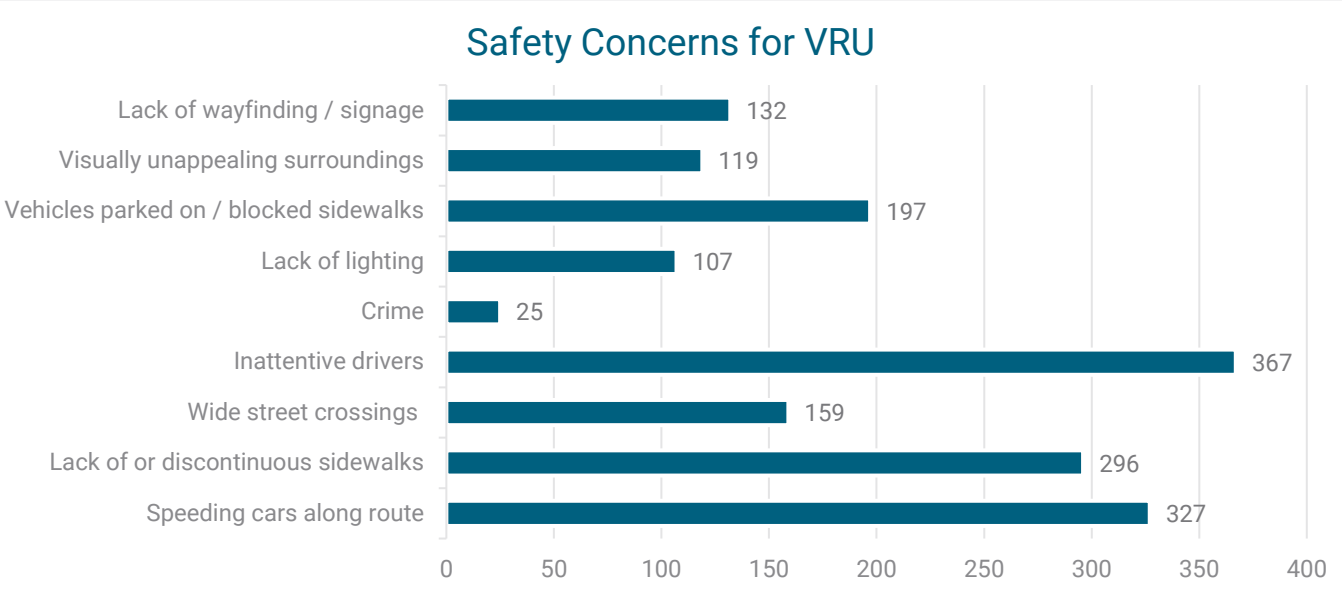


Figure 28

5. Program of Strategies

The Interagency Safety Committee, as part of the VRU Critical Emphasis Area in the SHSP, has set a goal to reduce annual VRU fatalities and serious injuries from 127 to 110 by the end of 2026. SHSP lists strategies for reducing VRU crashes.

- High Visibility Crosswalk Markings
- Rectangular Rapid Flashing Beacons
- Roundabouts
- Road Diets
- ADA Ramps & Curb Extensions
- Crosswalk Overhead Lighting

This VRU Assessment has furthered the conclusions drawn in the SHSP to provide greater specificity on how to meet the SHSP's goal. Several references are cited in the SHSP as foundations for further strategies related to improving traffic safety. Relevant documents include, but are not limited to, *Countermeasures that Work* (NHSTA), *Highway Safety Manual* (AASHTO), the *Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations* (FHWA), and NDOT's ADA Transition Plan.

Each of these documents was used as the foundation to develop the strategies listed below, which are categorized by HRA. These strategies can be combined and implemented as safety improvement projects in the identified High-Risk Areas. Furthermore, the Safe Systems Approach prescribes a multi-disciplinary approach to solving the challenges surrounding traffic fatalities and serious injuries. This involves developing a layered approach, employing participation from engineers, first responders, law enforcement, vehicle manufacturers, and users to mitigate negative outcomes of crashes.

5.1 Facility Types

Arterial streets, as well as specific collector and local facility types, are identified as the locations where severe VRU crashes are occurring at the highest frequency and where that frequency is most disproportionate from the centerline miles and VMT of those facility types. There also appears to be a relationship between lower volume under-capacity streets and higher frequency of crashes, ostensibly related to free flowing traffic with reduced attention from drivers as compared to more congested environments. Strategies below are effective and self-reinforcing countermeasures to reduce speed-related crashes.

- Identify and implement locations for road diet projects, especially in communities with higher VRU activity land uses along arterial streets. A notable focus area related to this HRA was daily traffic volumes under the capacity of the facility, suggesting a propensity for speed or inattention as contributing factors to crashes due to free-flowing conditions. These below capacity facilities may be strong candidates for lane reductions as a safety countermeasure.
- Install other traffic calming strategies such as roundabouts.
- Reduce the VRU crossing time and distance by adding curb extensions, raised medians, and pedestrian refuge islands.

5.2 Lighting Condition

Lighting condition is discussed throughout this assessment, particularly crashes involving "dark (lighted)" conditions. These crashes appear to present a HRA surrounding dark (lighted) conditions with respect to arterial roadways and non-intersection locations. This crash attribute also revealed itself as disproportionate related to severity and frequency with respect to VRU crashes around parks and transit stops.

- Improve conspicuity for VRU in low-light conditions through use of proven safety countermeasures such as:
    - Leading Pedestrian Intervals (LPI) at signalized intersections
    - Removable in-street pedestrian crossing signs
    - Improved lighting at crossings
    - Enhanced yield to pedestrian signs
    - High-visibility crosswalk markings.
- As appropriate, additional traffic control such as right-turn-on-red restrictions and rectangular rapid flashing beacons (RRFB) could be considered.
- Update lighting standards to include improved pedestrian level lighting instead of only vehicle level intersection lighting or non-directional architectural lighting. Review current quality control/quality assurance measures for lighting installation and maintenance.

5.3 Land Use and Demographics

These factors, while not previously considered in safety planning in Nebraska, appear to provide additional clarity on where VRU crashes are occurring. Among the land uses, severe VRU crashes are most common around transit stops, which matches national trends noted by the Federal Transit Authority (FTA). The SVI used in this assessment appears to show a correlation between socially vulnerable census tracts and frequency of severe VRU crashes.

- Develop partnerships with Nebraska transit agencies to improve crosswalks and infrastructure around transit stops. The FTA has released an advisory memo that included recommendations to improve transportation infrastructure around transit stops to reduce the likelihood of bus-to-person collisions in these first mile/last mile areas. In addition to the other safety countermeasures, a transit stop specific countermeasure could be parking restrictions near stops.
- Proactive installation of VRU safety improvements in areas with a higher SVI Socioeconomic Index or higher SVI Racial/Ethnic Index can systemically reduce VRU crashes with a Safe Systems Approach. Completing gaps in sidewalk and pedal cyclist networks and providing connected marked crossing opportunities creates a more complete VRU infrastructure network to support safety.

5.4 Contributing Circumstances

This assessment defines an emerging correlation between what is documented as the most frequent non-motorist contributing circumstances and the age of the VRU. This analysis identified young children as being at higher involvement in VRU crashes with most of these crashes involving darting or improper crossing and occurring in the hours after school is dismissed. NHTSA and PEDBIKESAFE provide countermeasure selection tools specific to these crash types related to both infrastructure improvements and programming.

- Continue support for and collaboration with the Safe Routes to School program. This is an effective conduit for identifying infrastructure improvements for young pedestrians and bicyclists. This strategy overlaps with the safety improvement strategies by facility type when schools are located along or near arterial streets.
- Education was endorsed by several stakeholders. NHSTA describes multiple education strategies as highly effective, low-cost solutions to improve VRU safety and aligns with SSA.
    - Develop partnerships with school districts to develop bike and pedestrian safety education campaigns.
    - Support more driver education programs to develop the skills of young drivers.

5.5 Data Management

While data has always been foundational to safety planning, the supply of data and data management tools continues to improve and evolve. The following data management strategies were identified which will allow for further improvement in data analysis in future iterations of this assessment.

- Further collaboration with law enforcement to ensure crash records are recorded as completely and accurately as possible and reinforcing the importance of attention to crash circumstances.
- Pursue other relevant data sources, such as travel speed, commercial or employment centers, and VRU volumes.

6. Conclusions

This VRU Assessment was conducted to further the understanding of contributing factors and mitigation strategies specific to the non-motorist (VRU) CEA in the Strategic Highway Safety Plan. This assessment was done in accordance with the FHWA *Vulnerable Road User Safety Assessment Guidance* (October 2022) and follows the principals of the Safe Systems Approach (SSA). The SSA is a concept that focuses on developing strategic plans to mitigate fatal and serious injury crashes under the philosophies that improving safety is a shared responsibility among many stakeholders and that mitigating crashes is most effective when layering multiple strategies using a systemic and proactive approach across an agency's transportation network. This assessment was performed with the SSA underscoring the methodology in each of the four main steps which include:

- Assess VRU Safety Performance
- Perform a Quantitative Analysis to Identify High-Risk Areas
- Consult Stakeholders
- Develop a Program of Strategies to Address Crashes in High-Risk Areas

The VRU safety performance and quantitative analysis revealed several focus areas where fatal and serious injury VRU crashes were overrepresented in the data. The highest occurrence of severe VRU crashes is within census tracts with a Social Vulnerability Index greater than 0.8, in urban settings, along arterial streets with low volumes as compared their capacity, at non-intersection locations, or near transit stops, parks, social services, and schools.

A stakeholder consultation process was conducted that fielded input from stakeholders using a combination of online and in-person tools. This effort revealed a preference to use active modes to travel to or from recreation, retail, employment, and entertainment. Respondents expressed lack of infrastructure and inattentive or aggressive driving behavior as the largest barriers to travel as a VRU. Strategies that were discussed and most supported were driver education and infrastructure improvements that provided separation from traffic or enhanced visibility of VRU.

From these analyses, a program of strategies was developed that include several infrastructure improvements, education programs, and prioritization options to systemically reduce severe VRU crashes. Leading pedestrian intervals (LPI), raised median, parking restrictions, right-turn-on-red restrictions, enhanced signs, and pedestrian refuge islands were new additions to the list of VRU safety countermeasures previously identified under the SHSP's VRU CEA. The benefits of the SHSP strategies, and these additional strategies, can be enhanced by focusing implementation around VRU land uses like transit stops, parks, social services, and schools that are located along lower-volume arterial streets in socially vulnerable areas.

VRU fatalities and serious injuries have been increasing nationally. Though Nebraska has not experienced this same trend, the Interagency Safety Committee proactively identified the need to directly support improving safety for the non-motorists with the creation of a new non-motorist Critical Emphasis Area. The VRU Assessment continues and enhances this goal to reduce non-motorist fatalities and serious injuries from 127 to 110 fatalities and serious injuries by December 31, 2026. The strategies outlined in the VRU Assessment are opportunities to take action to achieve the shared goal of zero deaths on Nebraska roads. We can achieve this goal together.