Safety Program Overview

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Topics

- History of Highway Safety Improvement Program funding
- NDOT Process
- HSIP Project Implementations

Highway Safety Improvement Program (HSIP)

- The overall purpose of this program is to achieve a significant reduction in traffic fatalities and serious injuries on all public roads through the implementation of infrastructure-related highway safety improvements.

- Requires a data driven, strategic approach to improving highway safety on all public roads.

History of HSIP Funding

- Highway Safety Act of 1966
  - First major effort at the Federal level to reduce the number and severity of highway-related crashes
  - Required each state to develop and maintain a highway safety program that followed standards established by the Secretary of Transportation to reduce traffic crashes and their resulting fatalities, injuries and property damage.
- Highway Safety Act of 1973
  - Established categorical funding for five program areas:
    - Highway rail crossings, high hazard locations, pavement marking demonstration programs, elimination of roadside hazards, and Federal-aid safer roads demonstration

History of HSIP Funding

- Surface Transportation Assistance Act of 1978
  - Created Railway-Highway Crossings & Hazard Elimination Program
- HSIP- First included in SAFETEA-LU Legislation in 2005
- Infrastructure Investment and Jobs Act (IIJA) includes $3.2 billion in HSIP funds nationwide for FY26

FY	HSIP Apportionment
2017	$14,910,025
2018	$15,220,847
2019	$15,625,971
2020	$15,878,957
2021	$15,713,289
2022	$19,794,239
2023	$20,201,523
2024	$20,691,664
2025	$21,188,581
2026	$21,702,876

Nebraska HSIP Funds

- $21M in Federal Funding Annually For Nebraska
- $3M Annual Program For Local Agencies
  - Application Window Open From November To January
  - Approved Projects Announced In May

NDOT Safety Committee

- Multi-disciplinary committee
  - First formed in 1974

- NDOT Members
  - Traffic Engineering
  - Roadway Design
  - Districts
  - Local Assistance
  - Operations
  - Office of Highway Safety

- Non-NDOT Members
  - FHWA
  - City/ County representatives

HSIP Eligibility

- HSIP funds must be used to make improvements at locations which have demonstrated safety issues:
  - Vehicle occupants
  - Pedestrians
  - Bicyclists

- These improvements are measured by the frequency and severity of crashes
  - Crash Modification Factors
  - Societal Crash Costs

HSIP Eligibility – CMF's

- Countermeasure
- Crash type
- Crash severity
- Urban vs. Rural

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Nebraska Crash Modification Factors (CMFs)

TRAFFIC ENGINEERING

NDOT REFERENCE NUMBER	COUNTERMEASURE	AREA TYPE	EXISTING CONTROL TYPE	PRIOR CONDITION	CRASH TYPE	KABCO CRASH SEVERITY	SERVICE LIFE (Years)	CMF ID	CMF
INTERSECTION - Geometric									
1.1	**Roundabout - Single Lane**								
1.1.1	Two-Way Stop-Control (TWSC) to Single Lane Roundabout	Rural	Minor Road Stop-Control		All	All	20	229	0.290
1.1.2	Two-Way Stop-Control (TWSC) to Single Lane Roundabout	Urban	Minor Road Stop-Control		All	All	20	233	0.612
1.1.3	Signal Control to Single Lane Roundbout	Rural	Signal	CMF Area type = All, but NDOT uses for rural area	All	All	20	225	0.522
1.1.4	Signal Control to Single Lane Roundbout	Urban, Suburban	Signal	3-leg, 4-leg intsxs	All	All	20	4256	0.735
1.1.5	Signal Control to Single Lane Mini-Roundabout	Urban, Suburan	Signal		All	All	20	4184	0.790
1.1.6	All-Way Stop-Control to Single Lane Roundabout	Rural	All-Way Stop-Control		All	All	20	N/A	0.558
1.2	**Roundabout - Multilane**								
1.2.1	Two-Way Stop-Control (TWSC) to Multilane Roundabout	Rural	Minor Road Stop-Control	4-leg intsx, CMF Area type = All, but NDOT uses for rural area	All	All	20	227	0.560
1.2.2	Two-Way Stop-Control (TWSC) to Multilane Roundabout	Urban	Minor Road Stop-Control	4-leg intsx	All	All	20	231	0.710
1.2.3	Signal Control to Multilane Roundbout	Urban, Suburban	Signal	3-leg, 4-leg intsxs	All	All	20	4254	0.809
1.2.4	Signal Control to Multilane Roundbout	All	Signal	NDOT use for rural area	All	All	20	225	0.522
1.3	**Restricted Crossing U-Turn (RCUT)**								
1.3.1	Two-Way Stop-Control (TWSC) to Restricted Crossing U-Turn	Rural	Minor Road Stop-Control	3 leg, 4-leg intsxs	All	All	20	5555	0.652
1.3.2	Signal to Restricted Crossing U-Turn	Rural	Signal	3-leg, 4-leg intsxs	All	All	20	N/A	0.716
1.3.3	Signal to Restricted Crossing U-Turn	Urban	Signal or Minor Road Stop-Control	CMF Area type = All, but NDOT uses for urban area	All	All	20	10372	0.860
1.4	**Median U-Turn (MUT)**								
1.4.1	Two-Way Stop-Control (TWSC) to Median U-Turn	All	Minor Road Stop-Control	4-leg intsxs, divided by median. CMF Control Type = Signal, and Area Type = Urban/Suburban, but NDOT use for rural & urban TWSC intsxs.	All	All	20	10851	0.633
1.5	**Right-Turn Lane**								
1.5.1	Add Right-Turn Lane on One Major Road Approach	All	Minor Road Stop-Control	3-leg, 4-leg intsxs	All	All	20	285	0.860
1.5.2	Add Right-Turn Lane on One Major Road Approach	All	Signal	3-leg, 4-leg intsxs	All	All	20	286	0.960
1.5.3	Add Right-Turn Lane on Both Major Road Approaches	All	Minor Road Stop-Control	3-leg, 4-leg intsxs	All	All	20	289	0.740
1.5.4	Add Right-Turn Lane on Both Major Road Approaches	All	Signal	3-leg, 4-leg intsxs	All	All	20	290	0.920
1.5.5	Convert Right-Turn Lane to Offset Right-Turn Lane (ORTL)	Rural	Minor Road Stop-Control	4-leg intsx, divided by median	All	All	20	2774	0.940
1.5.6	Convert Free Right-Turn Lane to Right-Turn Lane(s)	Urban	Signal	Exit Ramp Terminal, Free RTL with receiving lane onto major road	All (intsx + exit ramp crashes)	All	20	N/A	0.440
1.5.7	Convert Free Right-Turn Lane to Right-Turn Lane(s)	Urban	Signal	Exit Ramp Terminal, Free RTL w/o receiving lane onto major road	All (intsx + exit ramp crashes)	All	20	N/A	0.737
1.6	**Left-Turn Lane**								
1.6.1	Add Left-Turn Lane on One Major Road Approach	Rural	Minor Road Stop-Control	3-leg intsx	All	All	20	253	0.560
1.6.2	Add Left-Turn Lane on One Major Road Approach	Urban	Minor Road Stop-Control	3-leg intsx	All	All	20	254	0.670
1.6.3	Add Left-Turn Lane on One Major Road Approach	Rural	Minor Road Stop-Control	4-leg intsx	All	All	20	260	0.720
1.6.4	Add Left-Turn Lane on One Major Road Approach	Urban	Minor Road Stop-Control	4-leg intsx	All	All	20	261	0.730
1.6.5	Add Left-Turn Lane on One Major Road Approach	Rural	Signal	3-leg intsx	All	All	20	4643	0.850
1.6.6	Add Left-Turn Lane on One Major Road Approach	Urban	Signal	3-leg intsx	All	All	20	4644	0.930
1.6.7	Add Left-Turn Lane on One Major Road Approach	Rural	Signal	4-leg intsx	All	All	20	4647	0.820
1.6.8	Add Left-Turn Lane on One Major Road Approach	Urban	Signal	4-leg intsx	All	All	20	262	0.900
1.6.9	Add Left-Turn Lane on Both Major Road Approaches	Rural	Minor Road Stop-Control	4-leg intsx	All	All	20	268	0.520
1.6.10	Add Left-Turn Lane on Both Major Road Approaches	Urban	Minor Road Stop-Control	4-leg intsx	All	All	20	269	0.530
1.6.11	Add Left-Turn Lane on Both Major Road Approaches	Rural	Signal	4-leg intsx, CMF Area Type = All, but NDOT only uses for Rural	All	All	20	4648	0.670
1.6.12	Add Left-Turn Lane on Both Major Road Approaches	Urban	Signal	4-leg intsx	All	All	20	270	0.810
1.7	**Diverging Diamond Interchange (DDI)**								
1.7.1	Convert Diamond Interchange to Diverging Diamond Interchange	All	Signal	Diamond Interchange	All	All	20	10135	0.633
1.8	**Intersection Skew Angle**								
1.8.1	Change Minimum Intersection Angle	Rural	Minor Road Stop-Control	3-leg intsx of 2-lane roadways	All	All	20	10069	F(x)
1.8.2	Change Minimum Intersection Angle	Rural	Minor Road Stop-Control	4-leg intsx of 2-lane roadways	All	All	20	10066	F(x)
1.9	**Access Management**								
1.9.1	Convert Full-Access Intsx into 3/4-Access (right-in, right-out, left-in) Intsx	All	Minor Road Stop-Control	4-leg intsx	All	All	20	351	0.800
INTERSECTION - Lighting									
2.1	**Intersection Overhead Lighting**								
2.1.1	Install Intersection Lighting	All	Not Specified	3-leg, 4-leg intsxs, no existing overhead lighting	All-Nighttime	All	20	4462	0.881

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HSIP Eligibility – Societal Crash Costs

SOCIETAL COSTS OF NEBRASKA TRAFFIC CRASHES (2024)

	Costs Recommended by FHWA
Fatal Crash	$20,585,740
A-Injury Crash	$1,193,730
B-Injury Crash	$361,760
C-Injury Crash	$228,900
PDO Crash	$21,700

MULTI-VEHICLE CRASHES

	URBAN	RURAL
Angle Crash	$182,010	$776,300
Front-to-Rear Crash	$110,900	$294,290
Sideswipe (Same) Crash	$63,490	$158,580
Sideswipe (Opposite) Crash	$147,720	$415,390
Front-to-Front Crash	$467,790	$6,147,190
Collision with Parked Vehicle	$46,300	$114,540
Other Multi-Vehicle Crash	$67,030	$418,160

SINGLE VEHICLE CRASHES

	URBAN	RURAL
Collision with Train	$979,010	$2,871,870
Collision with Pedestrian	$1,327,760	$6,807,320
Collision with Bicycle	$479,450	$2,298,330
Collision with Animal	$36,750	$58,260
Collision with Fixed Object	$216,790	$423,700
Overturn	$781,050	$897,770
Other Single Vehicle Crash	$191,230	$186,180

Recommended costs come from FHWA Report, FHWA-SA-17-071, *Crash Costs for Highway Safety Analysis*, January 2018. Base year societal costs are inflated to current year using the Consumer Price Index and Median Usual Weekly Earning inflation method in the FHWA Report, FHWA-SA-17-071.

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HSIP Eligibility

- NDOT aims for Benefit / Cost ratio of ≥ 5.0

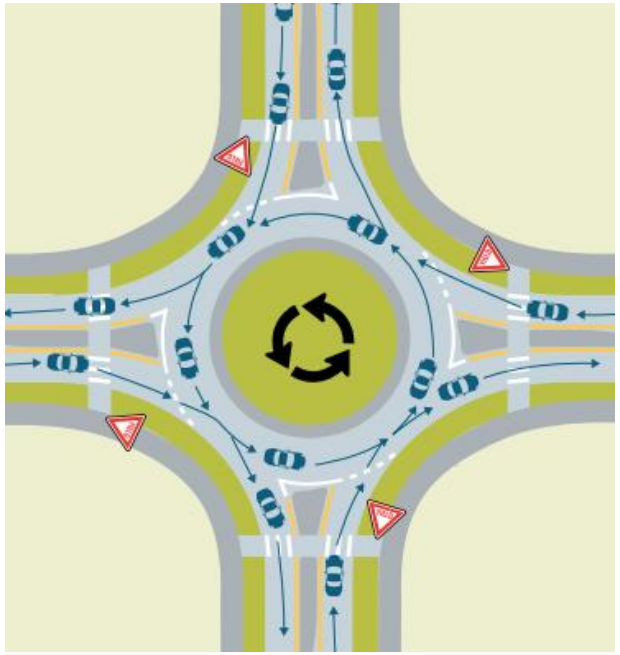
- Requires local cost share as outlined in DOT-OI 60-11 *Municipal Cost Sharing* at the following percentages:
  - 80% / 20% if NDOT is Responsible Charge
  - 90% / 10% If Municipality is Responsible Charge

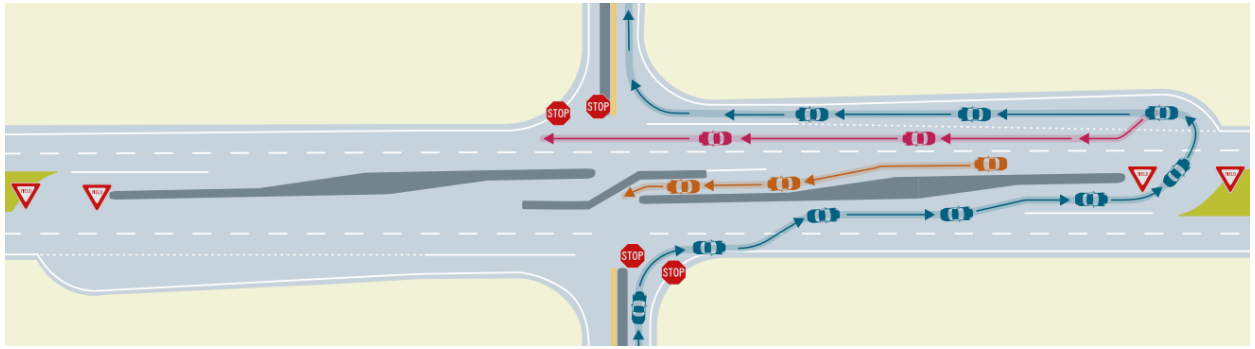
HSIP Eligibility – Critical Emphasis Areas

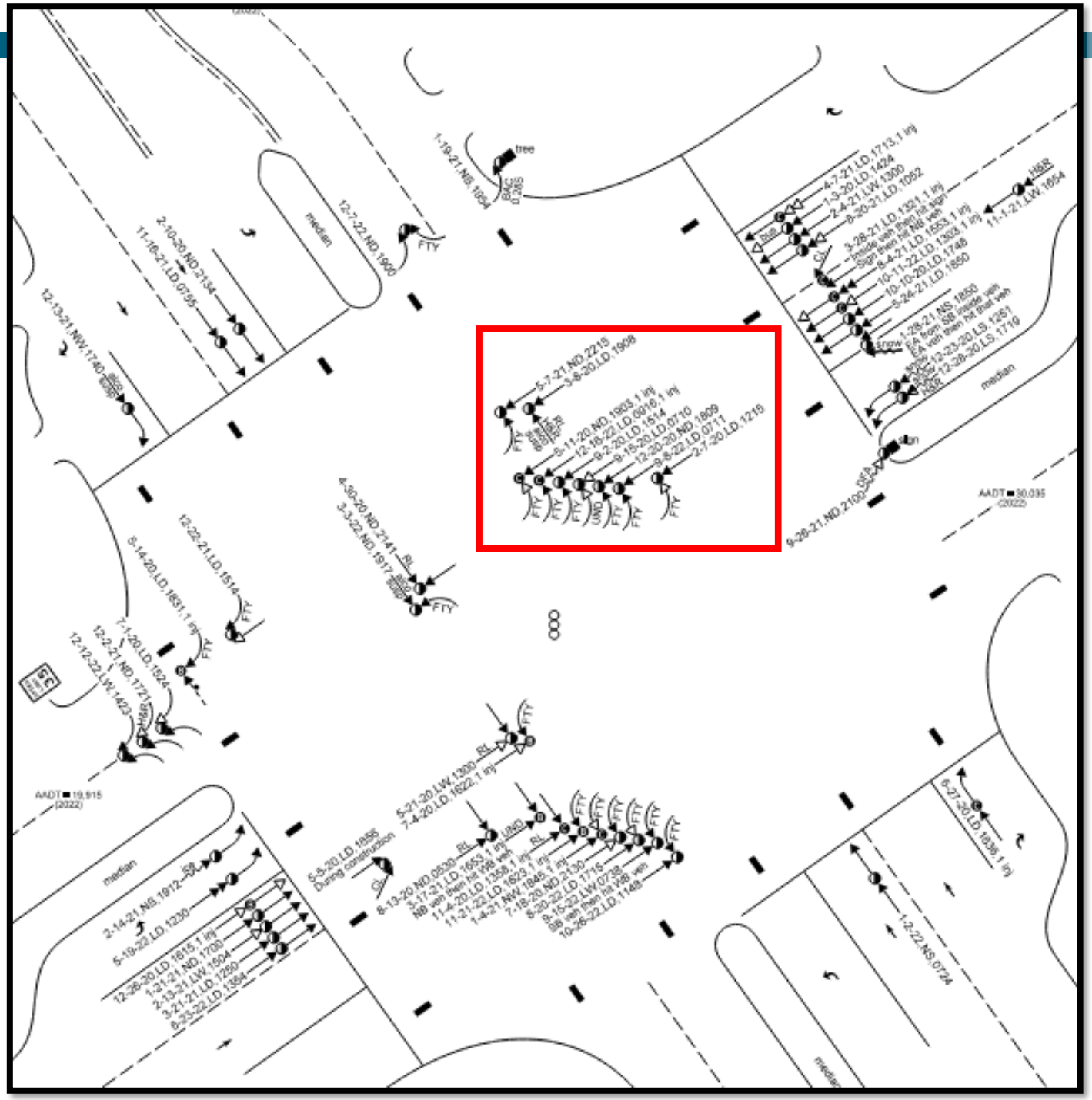
- Increasing Seat Belt Usage
- **Reducing Roadway/Lane Departure Crashes**
- Reducing Impaired Driving Crashes
- **Reducing Intersection Crashes**
- Reducing Young Driver Crashes
- Reducing Older Driver Crashes
- **Reducing Non-Motorist Crashes**
  - **Bicyclists and Pedestrians**

Typical Projects

- Intersection Modifications
  - Addition of Turn Lanes
  - Roundabouts
  - RCUTs
- Cable Median Barrier
- Paved Shoulder Widening
- Lighting
- Geometric modifications
- Rumble strips







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HSIP Project Implementations

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Rumble Strips

- NDOT began installing in 1996 on multi-lane roadways
- 2006 – began installing on 2-lane roadways
- 2011 – centerline rumble strips



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Roundabout
Pleasant Dale – US-6 & N-103





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Roundabout
Oakland – US-77 & N-32

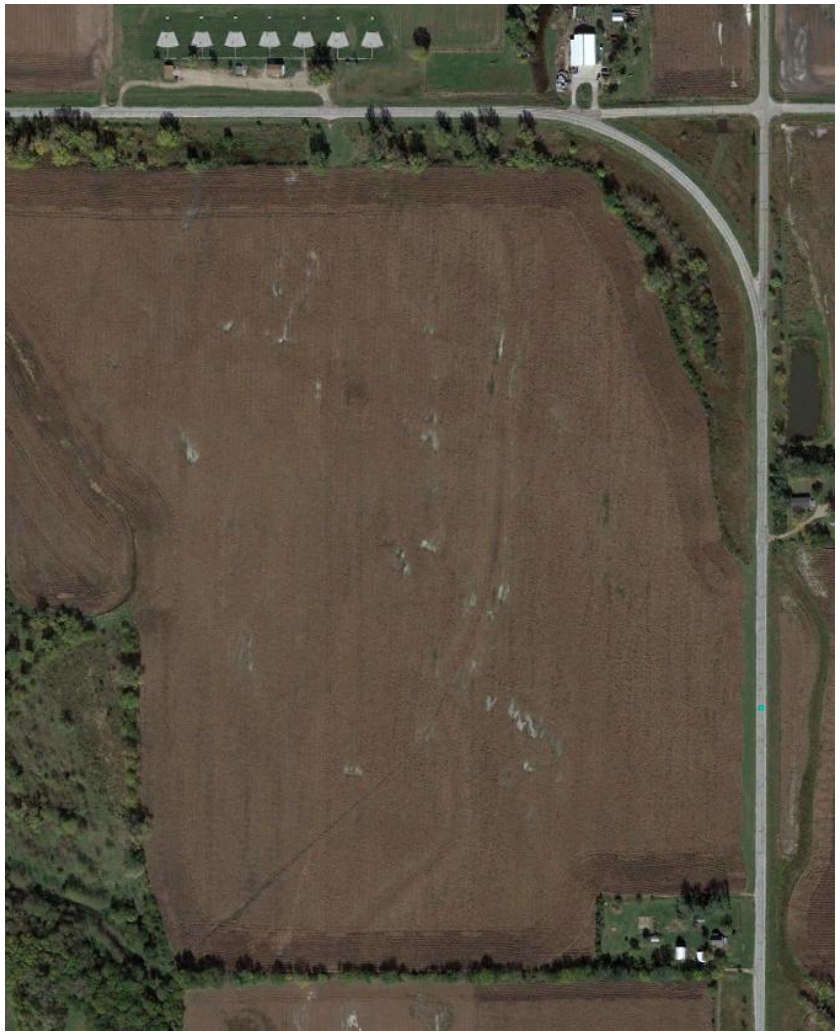






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Geometric Modifications
N-66 – North of Ashland (2015)





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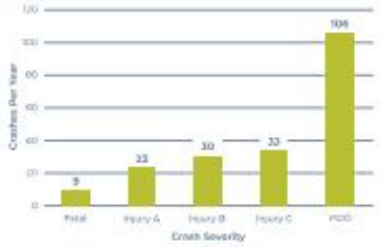
Interstate 80 Cable Median Barrier (CMB)

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I-80 Cross-Median Crashes (2013-2018)



Experience in Other States

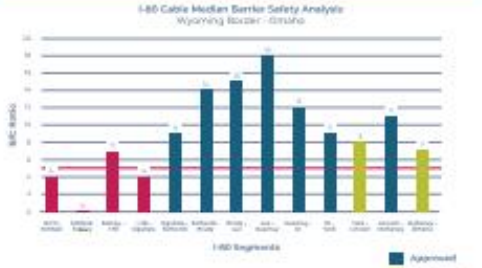




Early Decisions

Design Layout	Center of Median
Mowing Operations	4' Wide Mow Strip
Where to Install	Benefit/Cost ≥ 5
Strike Frequency	US-75 CMB Strikes
Repair Costs & Budget	US-75 CMB Strikes
Vehicle Capture or Penetration	Iowa DOT Study
Crash Outcomes	Iowa DOT Study
Emergency Responder Training	New Info & Outreach

Benefit-Cost Analysis & Projects Approval



15
Miles Constructed Per Year

20
Years

$131
Million



First Responder Training



- Creation of a 2-page guide
- Coordination with Traffic Incident Management
- NDOT requires installation contractor to provide training
- Over 40 first responder agencies trained

Barrier Strikes



99%
Capture Rate

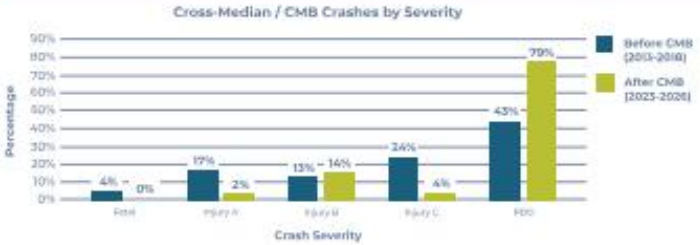


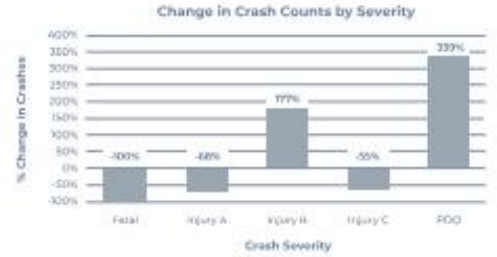
1.9
Avg. Strikes/ Mile/Year

13
Avg. Posts Damaged

$6,665
Avg. Repair Cost

Before and After Cross Median/CMB Crashes





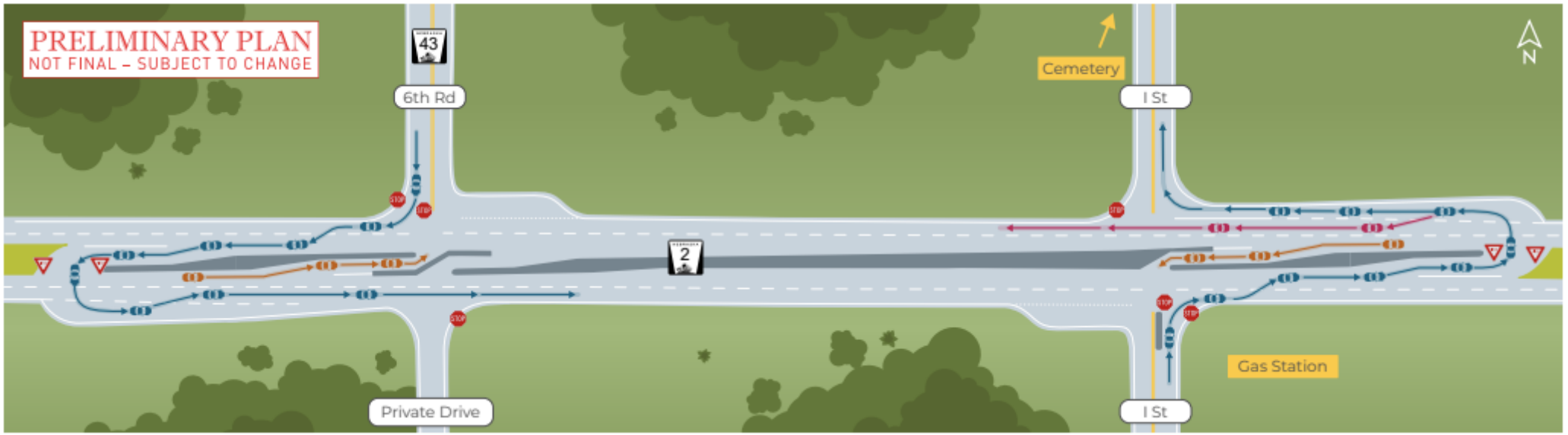
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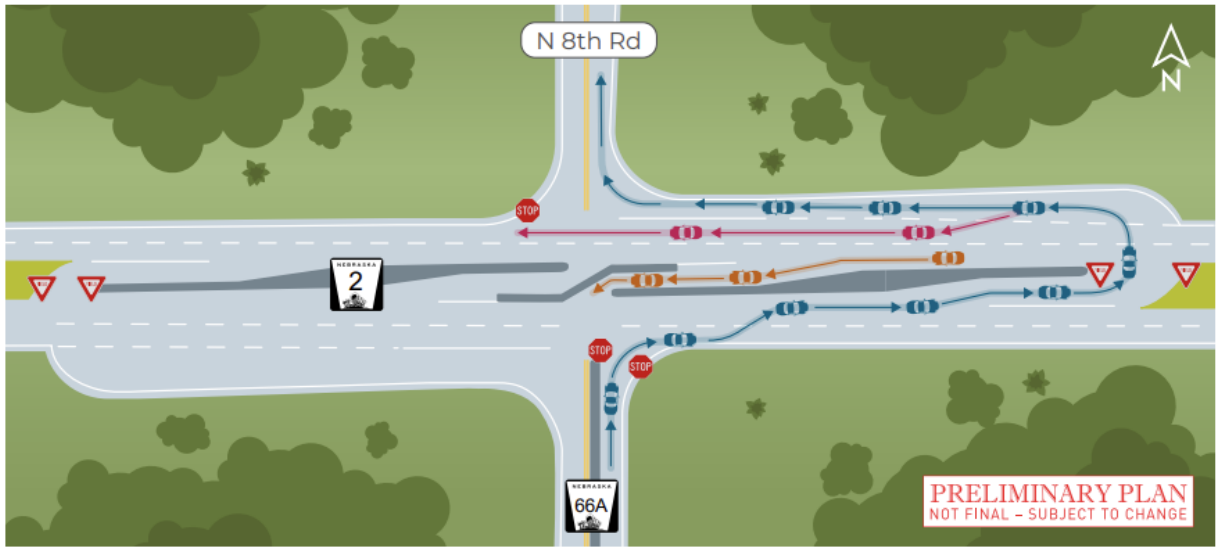
Cable Median Barrier





N-2 – Palmyra RCUT





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I-80 – Kearney East Viaduct





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High Risk Rural Roads

- Signing Projects
  - Provides signs, posts, etc.
  - County labor can be used as 10% match





Stop / Stop Ahead – 10,328 signs





Horizontal Curve – 8,284 signs



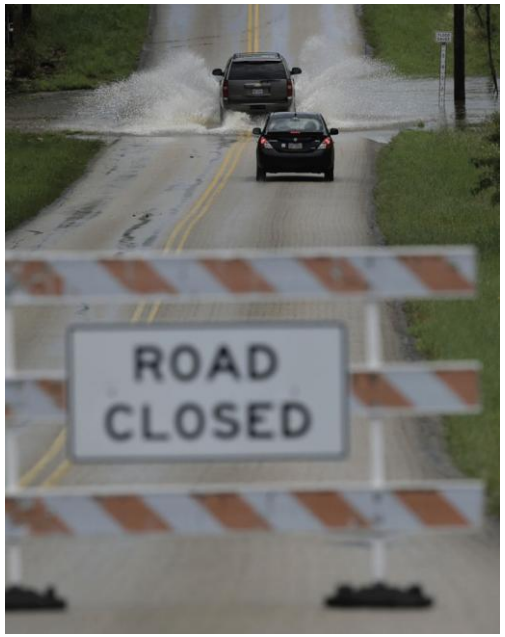
Railroad – 1,471 signs

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High Risk Rural Roads

- Training and HSIP Funded Equipment
  - Flagger Training & Free Equipment Kit
  - Road Closure Training & Free Equipment Kit
  - Traffic Incident Management Training & Free Equipment Kit











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Current Programmed Safety Projects

- 69 HSIP funded projects programmed thru 2034
- Safety Fund Portion- $239,434,727
- Total Project Cost- $617,931,645

Role of the Highway Commission?

- Pass along highway concerns from citizens
- Provide assistance with public outreach and education

Questions?