

ROADSIDE SAFETY

HSIP For Roadway Widening

How did we get there?

Larry Legg, P.E.

Assistant Lancaster County Engineer

MINK Local Roads 2026





Presentation Overview

**Lancaster County Rural Local
Road Safety Plan**

**Implementation of 28' Top 2+2
(2-Lanes with 2' Shoulder)**

**NDOT's systemic approach to 28'
Top "Program"**

LANCASTER COUNTY



- **Lancaster County**
 - Area – 850 Sq. Miles
 - Population 340,000
- **Lincoln**
 - 100 Sq. Miles
 - Population 300,000 (88% Urban)
 - Remaining population are in Rural Area or 2 Cities of the 2nd class and 10 villages
- **Primary road system is on a section line grid**
 - 1,350 miles of non-residential roads
 - 1,100 unpaved roads
 - 250 paved roads (20%)

The Path to a Local Road Safety Plan

- 2010
 - Webinar detailing Minnesota's Local Safety plans process
 - 2011
 - Low Volume Roads Conference
 - 2014
 - Approval to proceed with Local Safety Plans
 - Pilot Project - up to Five Counties
 - Funding - 90% HSIP, 10% local
 - Solicitation of Counties
 - ID high fatal, Serious injury, A,B
 - Asked 5, 3 accepted
 - Asked 5 more, 0 accepted
 - Why Seven No's
 - Local County Government not willing to:
 - Provide 10% match
 - Time commitment –LPA to be involved in the entire process
 - Face to Face Meetings
 - Site reviews
-

How LRSP started in Nebraska (Cont)

NDOR Selected a LRSP Consultant

- Reviewed other DOT Process
 - 2016 Pilot failed !
 - Why ?
 - Unsure maybe due to Rural makeup.
 - Not a a lot of "Black Spot" data
 - More Gravel than pavement
 - Active HRRR program that had already accomplished many of the low cost solutions for the state.
-

LRSP in Lancaster County

Fast FORRRWD to 2019

NDOT Traffic Division contacted Lancaster County Assistant Engineer to ask if we would be interested in participating in the creation of a LRSP for Lancaster County

- In cooperation with NDOT and FHWA, Lancaster County participated in the
- **2020 FHWA Local Roads Safety Focused Approach Technical Assistance**
- With the assistance of VHB, an engineering consultant, FHWA, NDOT and COVID
 - Beginning in April 2020 We held virtual Stake holder meetings
 - Assembled Crash Data
 - Finalized Strategies
 - And delivered a Local Road Safety Plan Fall of 2021

Lancaster County

Rural Local Road Safety Plan

FALL, 2021



Lancaster County Crash Pattern

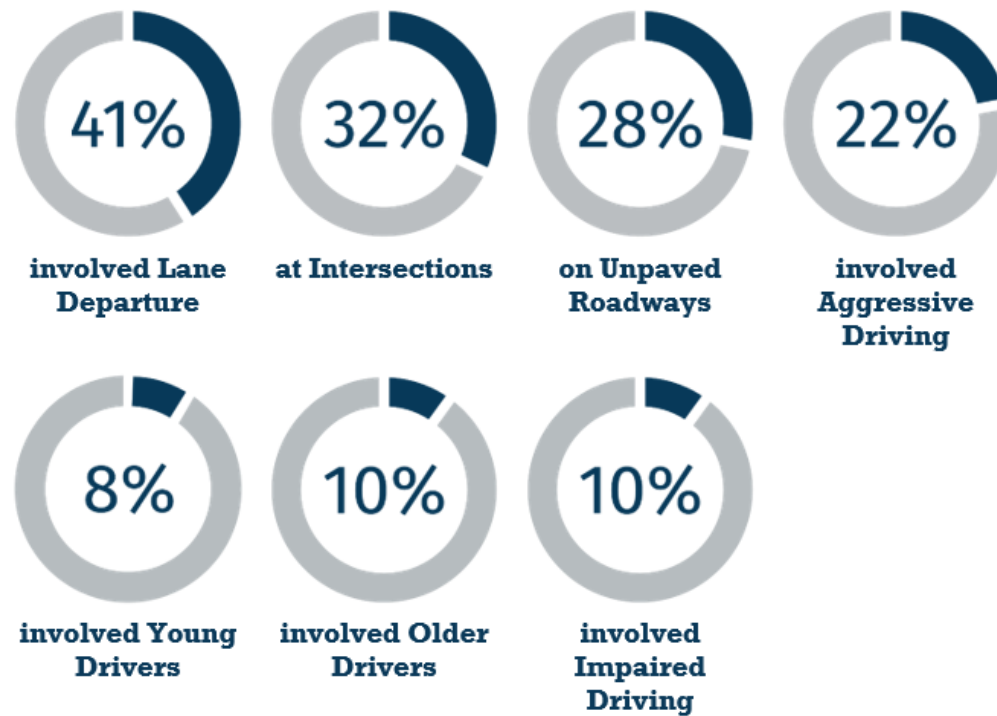


Figure 5. Graphic. Crash factors in Lancaster County (Source: Nebraska DOT).



Lancaster County Safety Improvement Options

- Rural Local Road Safety Plan Identified Corridors For Reducing Rural Roadway Departure Crashes
- Rural LRSP Identified Some Proven Safety Countermeasure Strategies
 - Safety Edge
 - Centerline Rumble Strips
 - Edgeline and Shoulder Rumble Stripes/Strips
 - Widening/Adding Pavement/Shoulders

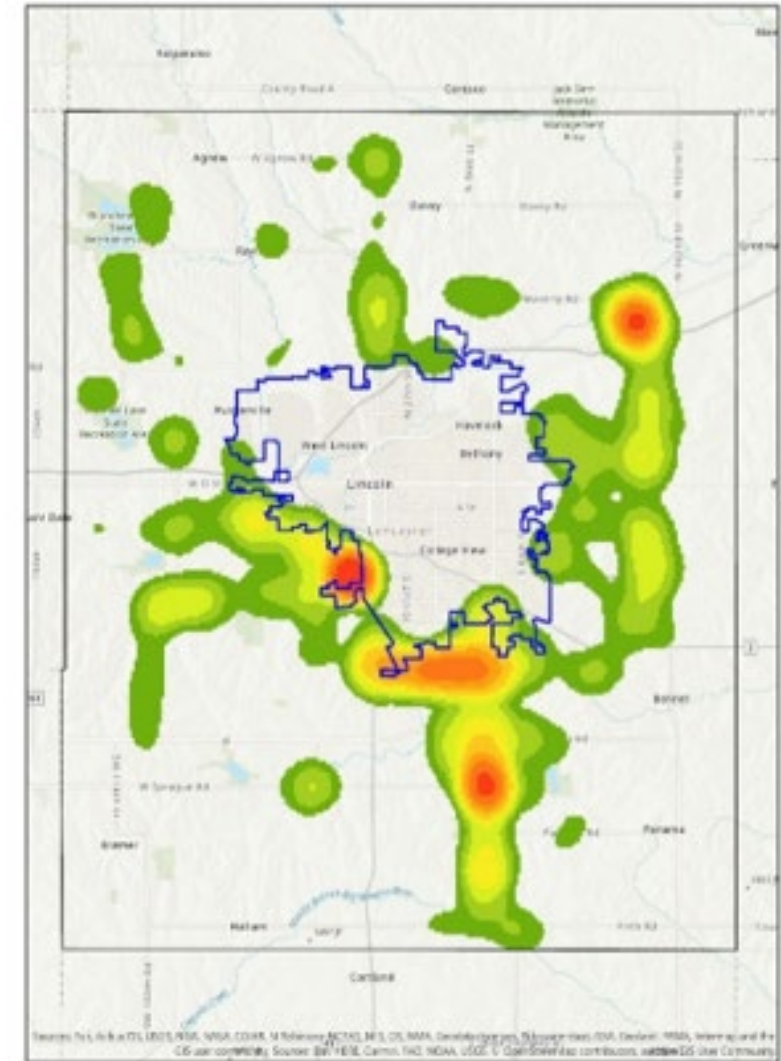


Figure 4. Graphic. Crashes weighted by severity on local Lancaster County roadways (Source: Nebraska DOT).

$$2 + 2$$

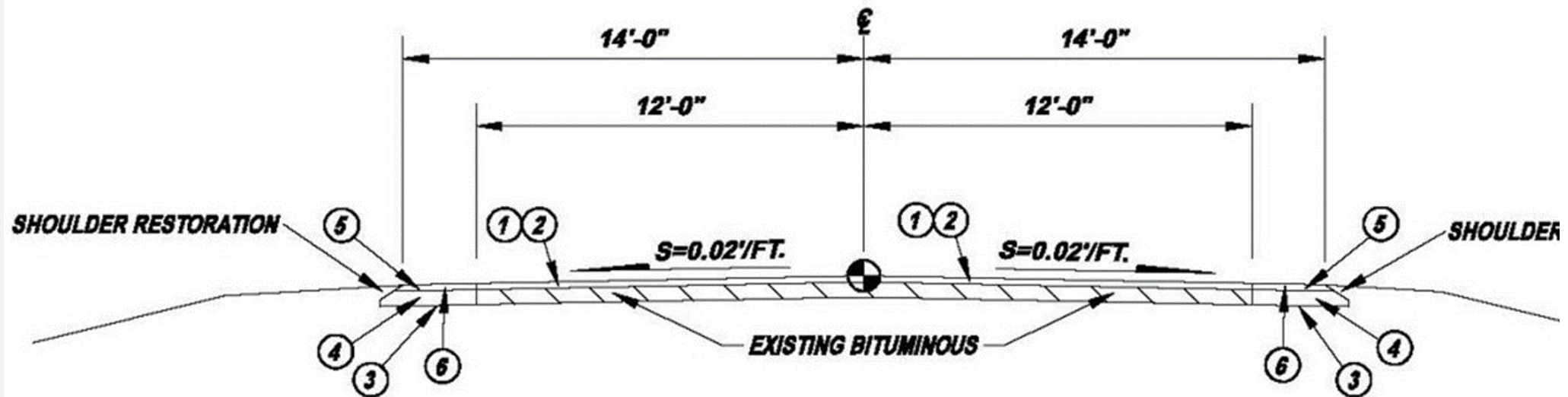


- Is anyone Asking, "What the heck is $2 + 2$ "

2 + 2 ?



to describe anes with 2



Why Use 28' Top

ADT on Paved Roads

Ranges from less than 400 to over 7,000

Noticed shoulder maintenance issues with ADT over 500

Edge Drop Off

White Line Patching



Beginning of a 28' Top “Program”



- **Safety Benefits**

- Reduction of Edge Dropoff

- **Edgeline Rumble Stripes**

- Wet Pavement Reflectivity

- **Safety Edge**

- Reduces Severity of runoff the road occurrences.

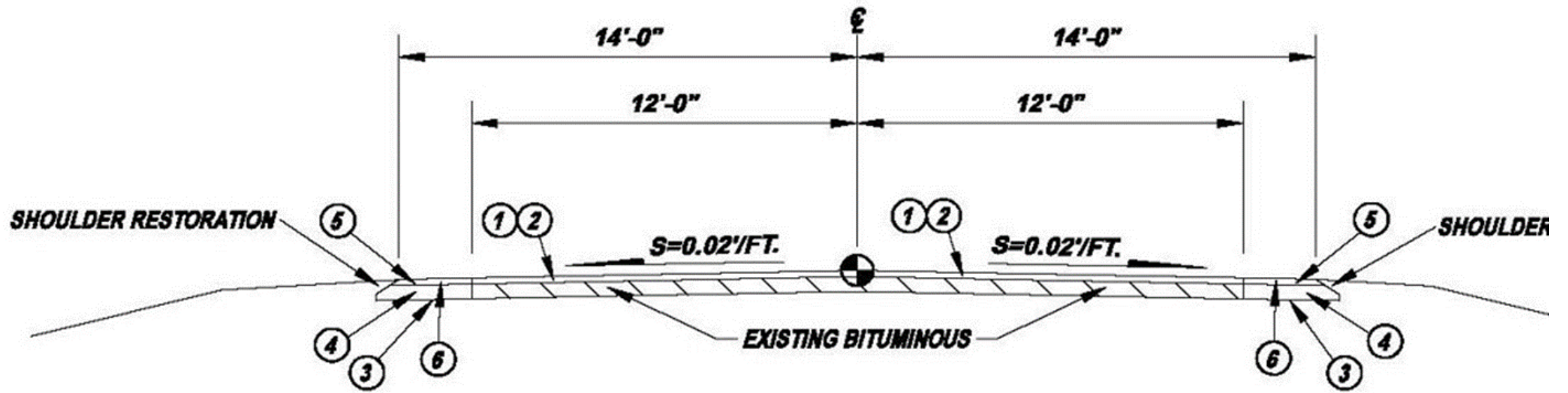
BEGINNING OF A 28' TOP "PROGRAM"

**Began incorporating
28' top into overlay
program when:**

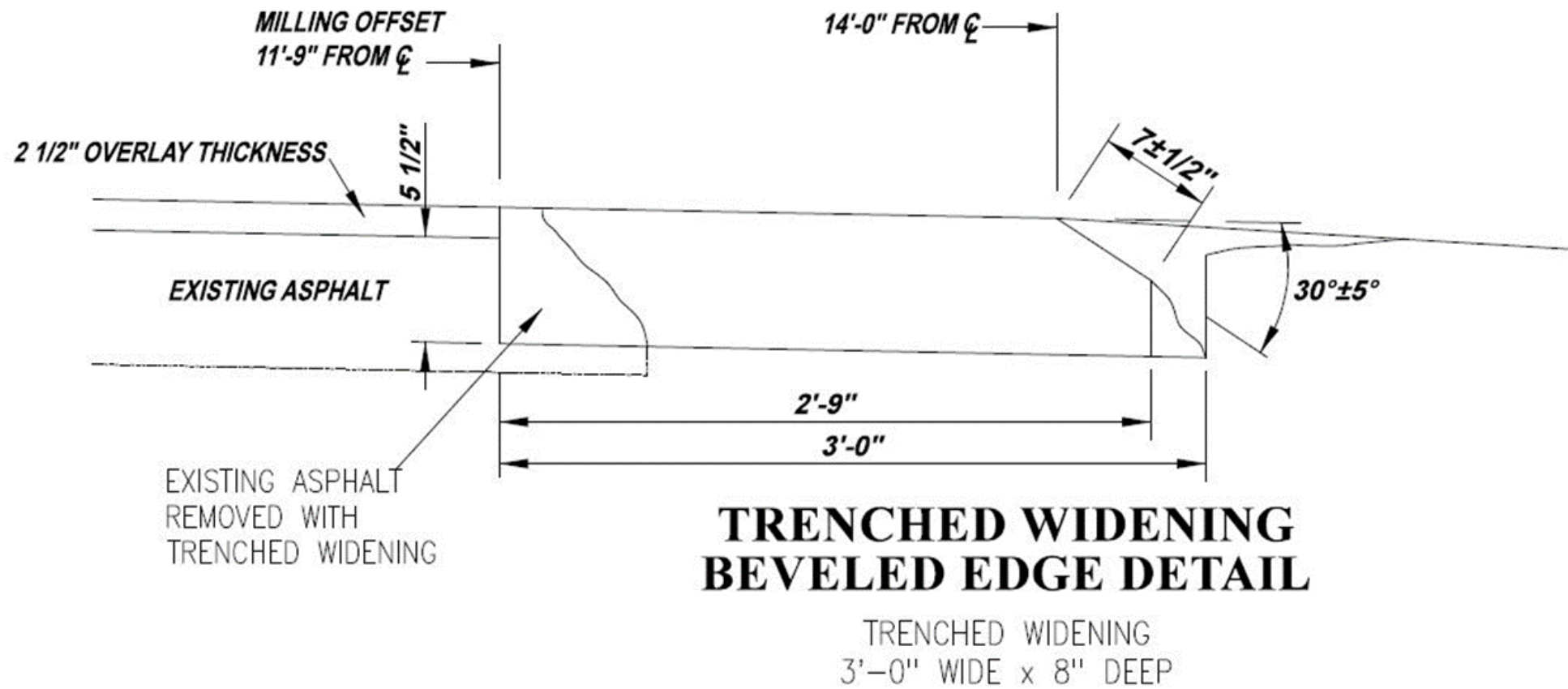
- ADT IS GREATER THAN 500
- A PAVEMENT EDGE DROP OFF WAS OBSERVED
- NOT ALL PAVED SECTIONS CAN ACCOMMODATE 28' TOP WITHOUT GRADING
- NARROW SHOULDERS

**We have tried a
couple of options to
accomplish 28' tops**

- TRENCH WIDENING WITH HIP 26' WIDE THEN OVERLAY WITH 1" SLX
- MILL 2", TRENCH WIDENING THEN OVERLY WITH 2" SPR

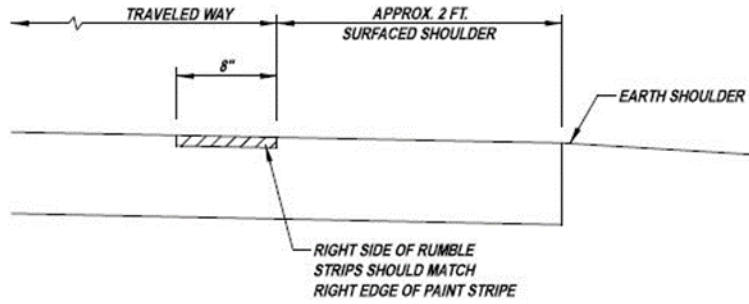


Lancaster County 28' Typical Section

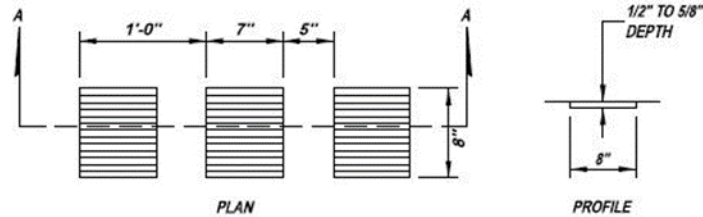


Lancaster County 28' Trench Widening Detail

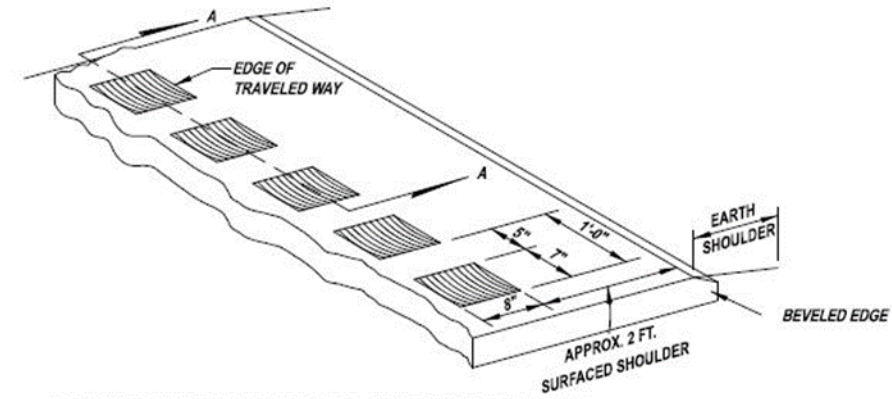




EDGE LINE ON 28 FEET ROADWAY



EDGE LINE RUMBLE STRIPS SHAPE



EDGE LINE RUMBLE STRIPS DETAIL

Lancaster County 28' Edgeline Rumble Stripes Details



NW 126th Street

NW 126TH STREET



Cost of 28' Top

- Cost Per Mile 24' Overlay

- Approximately \$160,000/Mile
 - Profile cold mill and 2" SLX overlay
- This is just cost of milling and SLX
 - All other items would be approximately the same

- Cost Per Mile of 28' Top

- Approximately an additional \$90,000
 - 3' Trench widening
 - 6" SPR consisting of 4" in trench and 2" top lift overlay
- CL rumble strips and edgeline rumble stripes add \$4,100/Mile

IS IT WORTH IT??

SAFETY

- Lancaster County has an average of over 50 run off road crashes per year
- Rumble stripes are a proven countermeasure to reduce run off road crashes
- Additional pavement width and reduction of edge drop off will also reduce the occurrence and severity of these crashes

REDUCED MAINTENANCE

- How much will be saved over the course of 15-20 years
- Not having to continually address edge line drop offs
- Not having to address white line patching

5/2021

- Preliminary Design (20-30%)
 - Analysis Of Existing Conditions
 - Roadway Section / Profile / Intersections
 - Crashes

11/2021

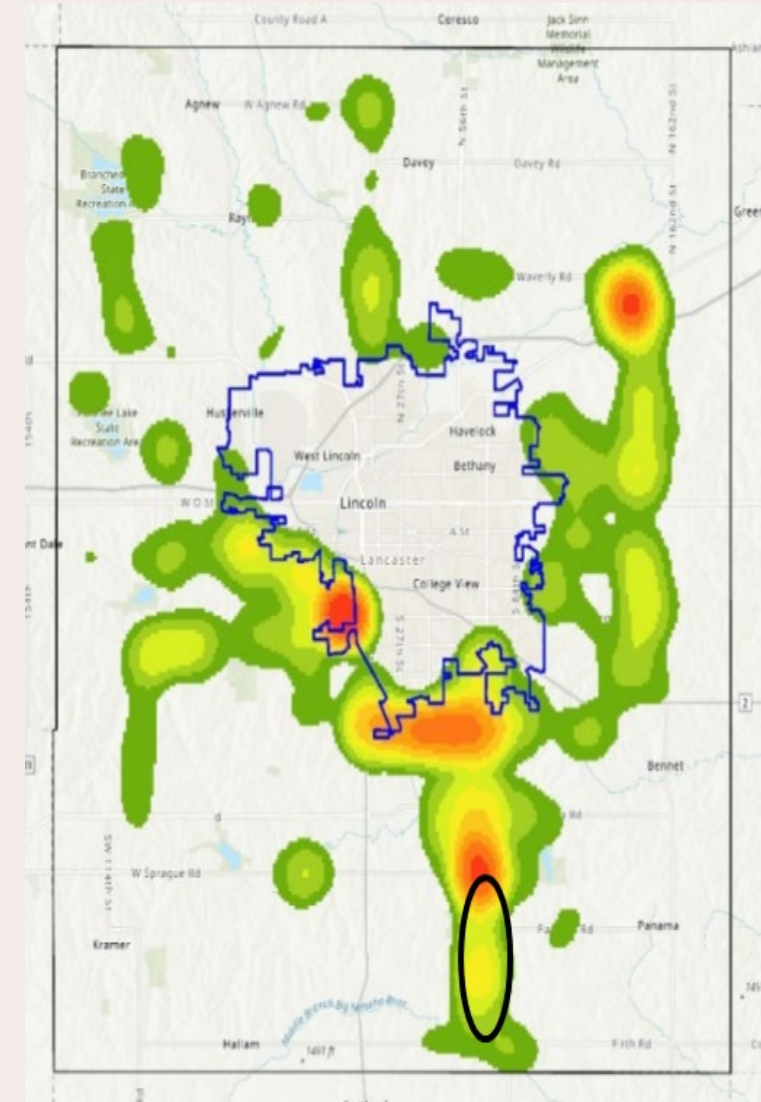
- Drafted Safety Analysis
 - Updated Crash Data
 - Selection And Application Of CMF

1/2022

- Coordinated With NDOT On Benefit-Cost Analysis
 - More On Selection And Application Of CMF
 - Calculation Of Benefit-Cost
 - Request For HSIP funding

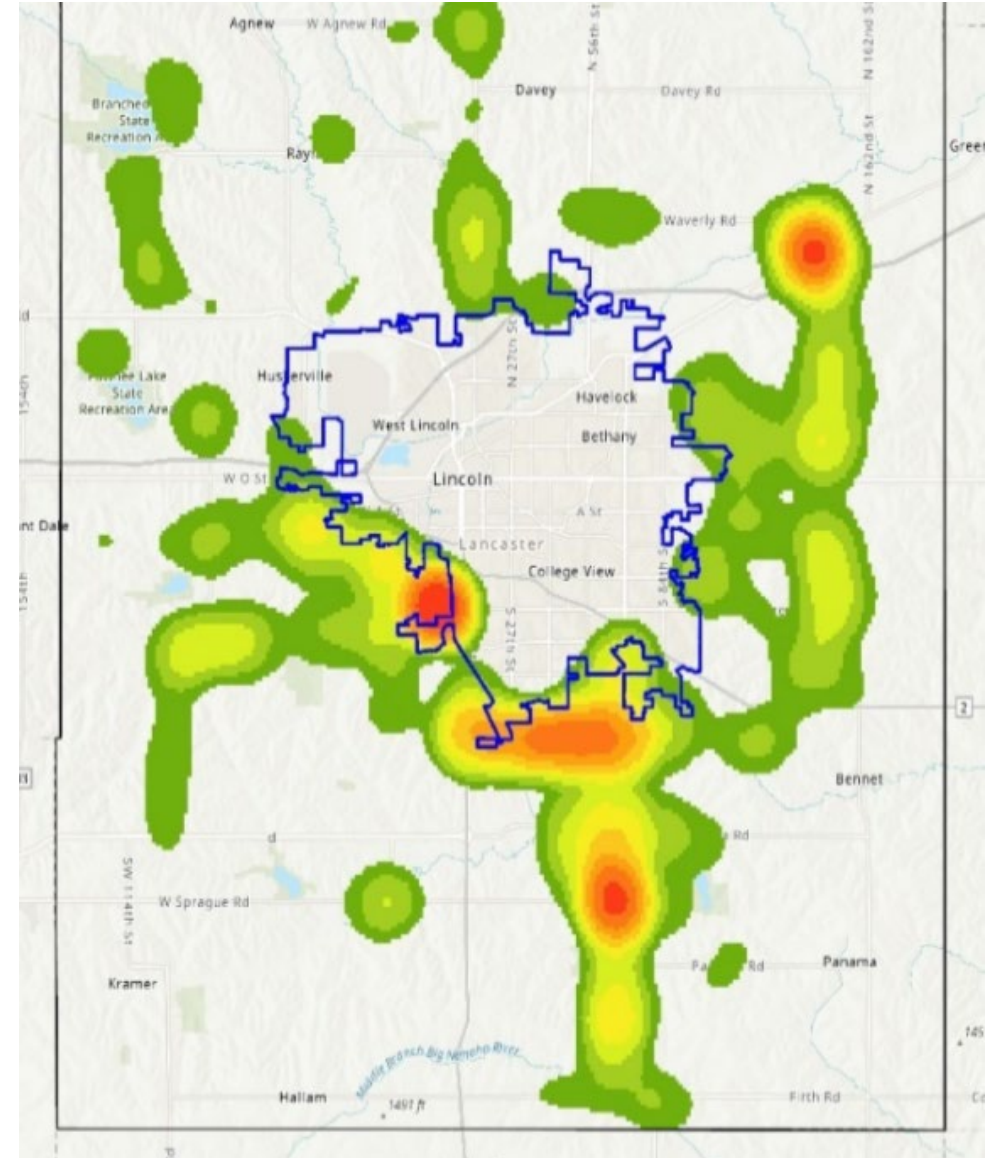
3/2022

- Nebraska HSIP Funding Approved
 - Time Consuming Benefit-Cost Process
 - No Guarantee Of Approval
 - Need Easier Systemic Process



County Participation in NE HSIP Funding

- Nebraska HSIP Funding is an open, competitive, and benefit-cost driven
- All projects compete based on benefit-cost



Source: Lancaster County Rural Local Road Safety Plan

STATE CRASH PATTERN

- 1,700+ Fatal, Serious, Or Visible Injury Rural Roadway Departure Crashes Per Year In Nebraska
- Critical Emphasis Area in Nebraska Strategic Highway Safety Plan
- Contributes To Rural Highways And County Roads Having Highest Fatality Rates
- Lancaster County Is Ranked Second Highest Nebraska County For Roadway Departure Fatalities And Serious Injuries (Includes Interstates, Highways, And County Roads)

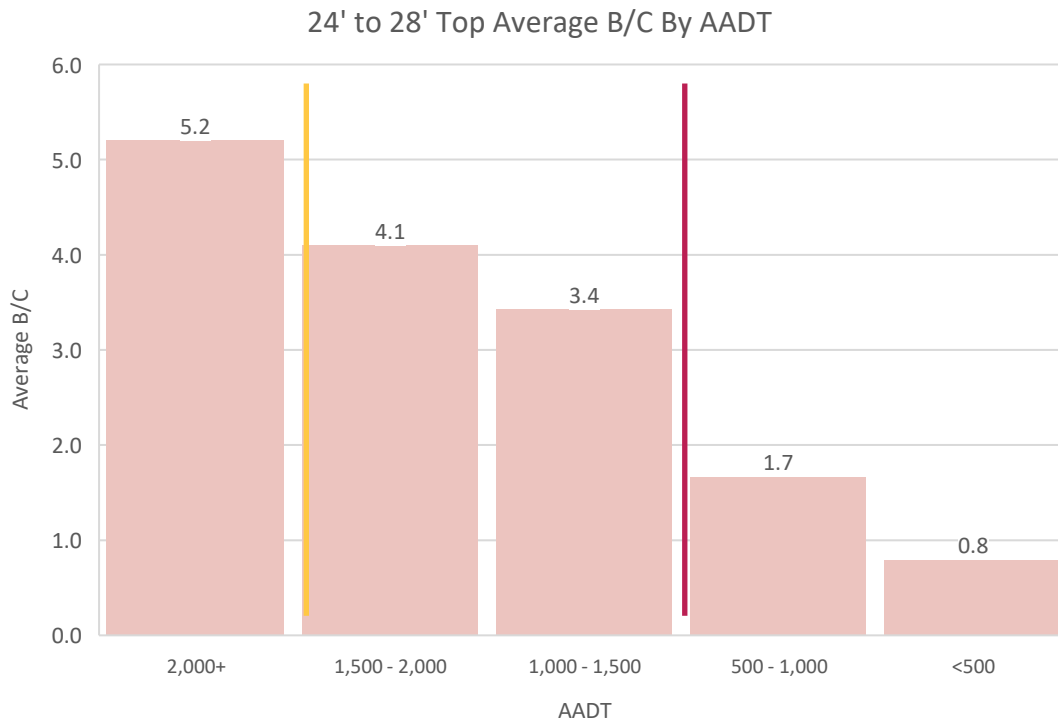


Proven Safety Countermeasure Implementation Status

- NDOT Highway System
 - Safety Edge Is Standard
 - Limited Adoption Of Centerline Rumble Strips
 - Policy On 2' Shoulder Width For Highways With AADT 2,000+
 - Not Enough Pavement For Rumble Strips/Stripes For Highways With Less Than AADT 2,000
- County Road Network
 - Limited Adoption Of Safety Edge
 - Limited Adoption Of Centerline Rumble Strips
 - Limited Paved Shoulders
 - Not Enough Pavement For Rumble Strips/Stripes



Countermeasure Evaluation and Analysis



- 28' Top Widening

- Systemic Safety Analysis To Create HSIP Funding Based On AADT
- Changed NDOT Policy To Install 2' Paved Shoulders And Edgeline Rumble Stripes For Rural Two-Lane Highways With 1,000+ AADT

Countermeasure Evaluation and Analysis



- Changed NDOT policy to install centerline rumble strips on 4,000+ miles of rural highway
- Anticipate saving 3.4 lives per year once fully installed

- Centerline Rumble Strips
 - Rural head-on crashes have a 12% chance of resulting in a fatality
 - Using an HSM Crash Modification Factor, the benefit-cost calculation showed 177:1 for installing centerline rumble strips on remaining rural two-lane highways

COUNTY HSIP 28' TOP PROGRAM

HSIP FUNDING

For Local Rural Road Surface Shoulders

NDOT has a new systemic safety program to add surface shoulders on rural local roads to help reduce roadway departure crashes.

Federal Highway Safety Improvement Program (HSIP) funding is available to widen rural roads to 28' total width with 12' lane and 2' surface shoulder in each direction. No safety analysis is required.

Rural Road Criteria

- Existing roadway <28' wide paved surface
- AADT $\geq 1,000$ vehicles per day in the design year
- Undivided roadway with two-way traffic
- Entire project must meet all federal-aid requirements and let for construction through NDOT Construction Office



Only surface shoulder widening, rumble strips, safety edge, earthwork, and ROW acquisition for the surface shoulder are eligible for safety funds. Mainline mill/fill costs are not HSIP eligible.

The new surface shoulders shall be constructed with a mainline mill/fill project for pavement continuity.

The safety funded 2' surface shoulder construction must include:

- Edgeline rumble stripes
- Safety edge (aka beveled pavement edge)
- Centerline rumble stripes



NEBRASKA
DEPARTMENT OF TRANSPORTATION



Mitch Doht, LTAP Director
402-472-7600
mdoht2@unl.edu

NDOT High Risk Rural Roads Team Led Creating County Program

Flyer Details Criteria For Participation And Required Proven Safety Countermeasures

County Checks AADT And Submits HSIP Funding Request With High Confidence Of Approval

Email Approval By NDOT

Significantly Reduced Work By County And NDOT

LANCASTER COUNTY HSIP 28' TOP PROJECTS

In Design

2026 - S 68th St, Firth Rd To Stagecoach Rd *HSIP*

2027 - N 14th St, Alvo Rd To Ashland Rd *HSIP*

2028 - S 68th St, Hickman Rd To Roca Rd *HSIP*

Pending Funding

W Van Dorn St, Coddington Ave To SW 84th St

W Denton Road, S Folsom St To SW 91st St

Adams St, Lincoln City Limits To N 148th St

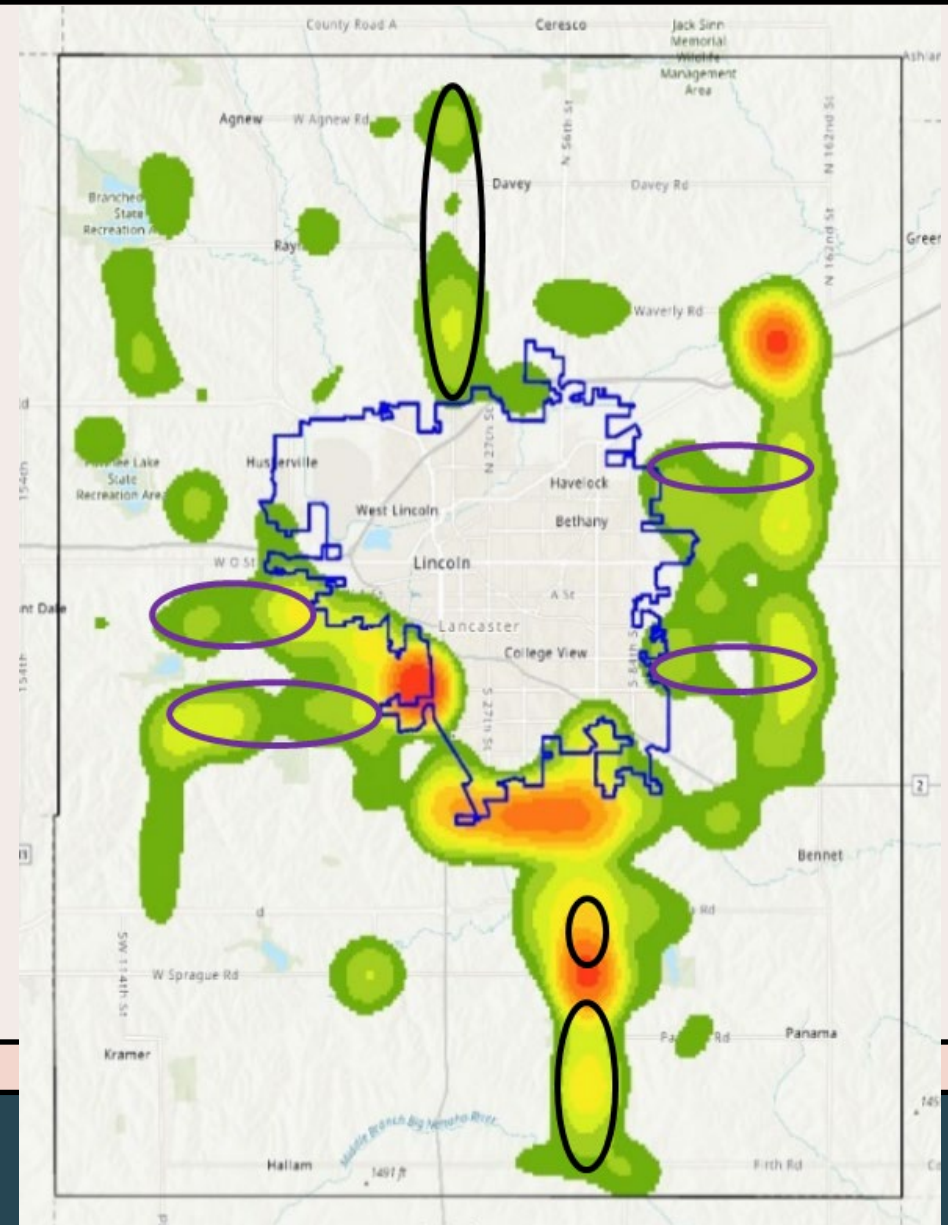
Completed

Old Cheney Rd, S 98th St To S 148th St –

Constructed with Local Funds in 2025

148th Yankee Hill Rd to US 34

Constructed with Local Fund in 2025



QUESTIONS

LARRY LEGG, P.E.

ASSISTANT LANCASTER COUNTY ENGINEER

402-441-1852

LLEGG@LANCASTER.NE.GOV