9

countermeasures

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Countermeasures Toolbox

A9.1 How to Use This Countermeasure Toolkit

The countermeasures included represent a toolbox of proven, FHWA-supported strategies that may be applied individually or in combination based on local context, documented safety risk, and implementation feasibility. Not every countermeasure is appropriate at every location. Selection should be guided by crash patterns, exposure risk, roadway function, surrounding land use, and community priorities, consistent with the Safe System Approach.

A9.2 When and Where Countermeasures Are Applied

Countermeasures are intended to be applied based on roadway context and user exposure rather than crash history alone. In Bridgeport, priority contexts include school routes, parks and recreation areas, downtown corridors, and state highways functioning as main streets. Quick-build treatments such as pavement markings, signing, and operational measures are emphasized where immediate safety benefits can be achieved, while capital improvements are reserved for locations where physical separation or geometric changes are necessary.

A9.3 Alignment with Crash Types and Risk Factors (reference table)

The countermeasures included in this plan collectively address the crash and risk factors most relevant to Bridgeport, including speeding, failure to yield, pedestrian exposure, nighttime visibility, driver expectancy, heavy vehicle conflicts, winter conditions, distracted driving, and accessibility gaps. Many countermeasures address multiple risk factors simultaneously, reflecting the Safe System principle that layered protections are more effective than single interventions. A summary mapping of countermeasures to crash and risk factors is provided in ***Table A9-1***. Key and legend used in Table A9-1 is provided below.

Crash / Risk Factors Key
A = Speeding
B = Failure to Yield / Turning Conflicts
C = Pedestrian Exposure
D = Nighttime Visibility
E = Driver Expectancy / Lane Ambiguity
F = Heavy Vehicles (Truck/Farm Equipment)
G = Winter Conditions
H = Distracted Driving
I = ADA / Accessibility Gaps

Legend:
● primary | ○ secondary
Primary Bridgeport Target Locations

A9.4 Design Guidance and Reference Framework

Each countermeasure sheet includes links to applicable federal and state guidance, including FHWA Proven Safety Countermeasures, the MUTCD, AASHTO design guidance, and NDOT standards where relevant. These references are provided to support implementation, coordination, and grant applications; they are not intended to replace detailed engineering judgment or agency-specific review requirements.

Table A9-1.

CM	Countermeasure	A	B	C	D	E	F	G	H	I
CM-01	High-Visibility Crosswalks	○	●	●	○	○		○		
	Downtown, schools, US-26/US-385 crossings									
CM-02	RRFBs	○	●	●	●	○				
	US-26 / US-385, school routes, parks									
CM-03	Yield Lines & State-Law Signs		●	●	○	○				
	Downtown, unsignalized highway crossings									
CM-04	Mid-Block Pedestrian Crossings		●	●	●	○				
	Schools, parks, US-26 / US-385									
CM-05	ADA Curb Ramps & Landings		○	●	○			○		●
	Downtown, schools, parks									
CM-06	Sidewalk Gap Closure			●	○			○		●
	School routes, downtown, residential areas									
CM-07	Multi-Use Paths			●	○					●
	Parks, recreation areas, edge-of-town corridors									
CM-08	Pedestrian Sidepaths	○	○	●	○			○		●
	US-26 / US-385 edges, transitional corridors									
CM-09	Parking Setbacks		●	●	○			○		○
	Downtown, schools									
CM-10	Sight Distance Improvements		●	●	○			○		
	Downtown, schools, parks									
CM-11	Targeted Pedestrian Lighting		○	●	●					○
	Downtown crossings, schools, parks									
CM-12	Speed Feedback Signs	●	○	○		○				
	School zones, parks, gateways									
CM-13	School Zone Speed & Signing	●	○	●	○	○		○		○
	Schools									
CM-14	Park Area Speed & Safety	●	○	●	○	○	○	○		○
	Parks, pools, recreation areas									
CM-15	Roadway Geometry & Operations	●	●	○	○	●	○	○		
	US-26 / US-385 intersections									
CM-16	Bus Loading Zones & Curb Mgmt	○	○	●	○	○		○		●
	Schools, Head Start									
CM-17	Crossing Guards	○	●	●	○			○		
	Schools									
CM-18	Dedicated Bus Pullouts	○	○	●	○	○		○		●
	Head Start									
CM-19	Truck & Farm Route Mgmt	○	○	○		○	●			
	US-26 / US-385, industrial/ag access									
CM-20	Truck Discouragement	○	○	●			●			
	Downtown, schools, parks									
CM-21	Snow & Ice Prioritization		○	●	○	○		●		●
	Schools, downtown, parks									
CM-22	Pavement Marking Refresh	○	○	○	●	●		●		
	Citywide; US-26 / US-385									
CM-23	Distracted Driving Education		○	○					●	
	Communitywide									
CM-24	Targeted Enforcement	●	●	●	○		○		●	
	Schools, downtown, highways									
CM-25	Youth Bike & Ped Education		○	●	○				○	
	Schools, parks									

A9.5 Individual Countermeasure Sheets (CM-01 through CM-25)

Pedestrian & Bicycle Safety

CM-01 High-Visibility Crosswalk Markings (6–8 ft continental)

CM-02 Rectangular Rapid Flashing Beacons (RRFBs)

CM-03 State-Law Pedestrian Yield Signage (R1-6 / R1-6a)

CM-04 Mid-Block Pedestrian Crossings

CM-05 ADA-Compliant Curb Ramps & Landings

CM-06 Sidewalk Infill | Gap Closure

CM-07 Multi-Use Paths | Shared-Use Paths

CM-08 Pedestrian Sidepaths | Shoulder Pedestrian Facilities

Visibility & Sight Distance

CM-09 Parking Setbacks at Intersections

CM-10 Sight Distance Improvements (Vegetation, Obstructions, Coordination)

CM-11 Targeted Pedestrian Lighting (Crossings & Intersections)

Speed Management

CM-12 Speed Feedback Signs

CM-13 School Zone Speed & Signing Treatments

CM-14 Area-Based Speed Management

Roadway Geometry & Operations

CM-15 Roadway Geometry & Operations (Painted Quick-build Treatments on US Highways)

School & Park Safety

CM-16 Curbside Loading | Pickup–Drop-Off Pull-Out Areas

CM-17 Crossing Guards (Operational)

CM-18 Bus Loading Zone Delineation (Operational)

Freight | Heavy Vehicle Management

CM-19 Truck & Farm Equipment Route Management

CM-20 Truck Discouragement Near Sensitive Land Uses

Maintenance & Operations

CM-21 Snow & Ice Removal Prioritization

CM-22 Pavement Marking Refresh Cycles

Education & Enforcement

CM-23 Distracted Driving Education (Education-First)

CM-24 Targeted, Data-Supported Enforcement

CM-25 Youth Bike & Ped Safety Education

Engineering	Enforcement	Education	Encouragement	Evaluation
CM-01–CM-15 primarily Network completion, crossings, speed, lighting, geometry, highways	CM-24 (Targeted Data-Driven) CM-17 (Crossing Guard – operational enforcement support)	CM-23 (Driver Education / Distracted Driving) CM-25 (Youth Bicycle/ Pedestrian Education)	CM-25 School & park-focused programming, Driver awareness campaigns	CM-12 data logging CM-24 performance tracking CM-22 marking condition tracking CM-21 winter priority mapping



Bridgeport SS4A Implementation Phasing

Quick-Build (Years 1–2)

Focus: *Immediate risk reduction using low-cost, high-impact treatments and programs*

Category	Key Actions	Countermeasures
Speed & Visibility	Deploy speed feedback signs; refresh markings; initiate lighting at priority crossings	CM-11, CM-12, CM-22
School & Park Safety	Implement school zone signing; establish bus loading zones; launch crossing guard program	CM-13, CM-16, CM-17
Pedestrian Safety	Install high-visibility crosswalks; advance yield lines; parking setbacks	CM-01, CM-03, CM-09
Operations & Maintenance	Snow/ice prioritization for pedestrian routes	CM-21
Education & Enforcement	Launch distracted driving campaign; initiate targeted enforcement	CM-23, CM-24
Planning & Coordination	NDOT coordination for highway crossings and striping concepts	(Enables CM-02, 04, 15)

Mid-Term (Years 2–3)

Focus: *Corridor packages, ADA access, and operational refinement*

Category	Key Actions	Countermeasures
Pedestrian Crossings	Install RRFBs and mid-block crossings where warranted	CM-02, CM-04
Accessibility	Deliver bundled ADA curb ramp upgrades and sidewalk gap closures	CM-05, CM-06
Roadway Operations	Implement painted geometry and gateway treatments on US-26 / US-385	CM-15
Freight Management	Adopt and sign truck & farm equipment routes	CM-19
Youth Safety	Launch bike & pedestrian rodeos and school programs	CM-25

Long-Term (Years 4–5)

Focus: *Capital projects, network completion, and program sustainment*

Category	Key Actions	Countermeasures
Connectivity	Construct priority shared-use paths and sidepaths	CM-07, CM-08
Early Childhood Safety	Build dedicated bus pullout for Head Start (as justified)	CM-18
Freight Safety	Implement truck discouragement near sensitive land uses	CM-20
System Sustainment	Refresh markings, adjust enforcement, refine winter priorities	CM-21, CM-22, CM-24

CM-01 High-Visibility Crosswalk Markings (6–8 ft continental)

Enhanced crosswalk pavement markings—most commonly ladder/continental style—used to increase driver awareness of pedestrian crossings on state highways and high-volume roadways where standard transverse lines alone are insufficient.

High-visibility crosswalk markings are applicable on both local streets and state highways; however, implementation on NDOT-controlled facilities requires additional coordination and is typically paired with enhanced crossing controls due to higher speeds and traffic volumes. In all contexts, these markings serve as a foundational visibility treatment and are often implemented as a first-step or companion measure alongside enhanced crossing treatments where additional control is warranted.

PROBLEM ADDRESSED

Standard transverse (two-line) crosswalk markings on higher-volume or higher-speed roadways are often insufficient to alert drivers to pedestrian crossings, particularly on multi-lane facilities, state highways, and corridors with truck traffic. In Bridgeport, pedestrian crossings along US-26 and US-385 experience reduced driver yielding, higher operating speeds, and limited conspicuity, increasing the risk of severe pedestrian injury.

SAFETY ISSUES ADDRESSED

Failure to yield to pedestrians at unsignalized crossings

Limited pedestrian visibility on wide or high-speed roadways

Driver surprise and delayed recognition of pedestrian crossings

Elevated crash severity risk for pedestrians on state highways

BENEFITS

Improves crosswalk visibility and driver recognition compared to standard two-line transverse markings, particularly on multi-lane or higher-speed facilities.[1] [2]

Associated with higher yielding rates and improved pedestrian visibility at unsignalized crossings.[1] [2]

Supports Safe System principles by reducing driver surprise and clarifying expected yielding behavior in pedestrian conflict areas.[2]

Relatively low-cost, quick-build treatment that can be implemented independently or paired with additional measures (RRFBs, advance yield lines, parking setbacks).

Widely accepted by NDOT and FHWA when applied in accordance with MUTCD standards and state guidance.

CONSTRAINTS AND LIMITATIONS

Markings alone may be insufficient on high-speed or multi-lane highways with heavy truck traffic; additional treatments (RRFBs, median refuge, advance yield lines) may be needed.[23]

Maintenance-dependent: visibility degrades with wear, snowplowing, dirt, and winter sanding operations common in Nebraska.

Does not change right-of-way law by itself; effectiveness improves when paired with signage and compliance measures.

NDOT approval required for installation on state-maintained highways or within NDOT right-of-way.

Must not be used in a manner that creates false expectations of yielding where sight distance, speed, or geometry make yielding unlikely without supplemental controls.



high visibility crosswalk, MCS

TYPICAL APPLICATIONS

Unsignalized pedestrian crossings on state highways through communities (US-26 / US-385) with documented pedestrian demand.

Downtown corridors where posted speeds are moderate but traffic volumes and truck percentages remain high.

School routes, park access points, community facilities, and mid-block crossings where pedestrians are expected.

Locations paired with RRFBs, pedestrian warning signage, or median refuges.

DESIGN CONSIDERATIONS

Marking type: MUTCD permits several styles; continental (ladder) markings are preferred for enhanced visibility on higher-volume roadways.[1]

Crosswalk width (NDOT-appropriate): On Nebraska state highways, 6–8 feet is commonly used and generally acceptable. Wider crosswalks may be appropriate at major pedestrian generators only with NDOT concurrence. Avoid unnecessarily wide markings that imply a pedestrian-priority condition inconsistent with traffic context.

Material selection: Use durable, high-reflectivity materials suitable for snowplow operations and winter maintenance cycles.

Supplemental signage: Pair with W11-2 (Pedestrian) warning signs and W16-7P arrow plaques as appropriate.

Lighting & visibility: Ensure crossings are visible at night; evaluate need for targeted lighting at locations with evening activity.

NDOT coordination: NDOT review is required for marking layout, materials, and maintenance responsibility on US highways.

Consistency: Apply consistently along corridors to avoid driver confusion (especially where multiple crossings exist).

TARGET LOCATIONS & USERS

Locations: Unsignalized crossings on US-26 and US-385

Downtown corridors with pedestrian activity

School routes, park access points, and community destinations

Mid-block crossings with documented pedestrian demand

Users: Pedestrians of all ages and abilities

School-aged children and older adults

Drivers on higher-speed or multi-lane facilities

STATE HIGHWAY CONTEXT (US-26 / US-385)

Enhanced crosswalk pavement markings—most commonly ladder/continental style—are used on state highways and high-volume roadways to increase driver awareness of pedestrian crossings where standard transverse lines alone are insufficient.

KEY CONSIDERATIONS FOR STATE HIGHWAYS

Most effective as a foundational or companion treatment rather than a standalone solution.

Frequently paired with RRFBs, advance yield lines, median refuges, or lighting.

Must be applied carefully to avoid creating false expectations of yielding where speeds, sight distance, or geometry limit driver response.

NDOT approval required for layout, materials, and maintenance responsibility.

Consistency along corridors is critical to maintain driver expectancy.

ELIGIBILITY

SS4A Eligibility: Eligible as an infrastructure safety countermeasure under SS4A Implementation Grants

Project Type: Low-cost, quick-build engineering treatment

Jurisdiction: Requires coordination and approval when located on NDOT-controlled facilities

COST AND TIMEFRAME

Cost: Low

Timeframe: Short-term (can typically be implemented within a single construction season)

Maintenance: Periodic restriping required due to snowplow wear and winter maintenance

IMPLEMENTATION PARTNERS

City of Bridgeport

Nebraska Department of Transportation (NDOT)

Local schools and community facility operators (for placement coordination)

Law enforcement (supporting yielding compliance, where applicable)

ONLINE REFERENCES

MUTCD (2009 + Revisions) – Section 3B.18 Crosswalk Markings [1] https://mutcd.fhwa.dot.gov

FHWA – Safety Effects of Marked vs. Unmarked Crosswalks [2] https://safety.fhwa.dot.gov/ped_bike/docs/crosswalks.pdf

FHWA – Proven Safety Countermeasures: Marked Crosswalks [3] https://safety.fhwa.dot.gov/provencountermeasures/marked_crosswalks.cfm

SS4A & SAFE SYSTEM ALIGNMENT

High-visibility crosswalk markings support the Safe System Approach by improving roadway design to reduce driver error and minimize the severity of pedestrian crashes. By increasing crossing conspicuity and reinforcing expected yielding behavior, this countermeasure addresses safer road design and safer speeds without relying solely on enforcement or user behavior.



CM-02 Rectangular Rapid Flashing Beacons

Rectangular Rapid Flashing Beacons (RRFBs) are pedestrian-actuated warning devices that use high-intensity, rapidly flashing rectangular LED indications to increase driver yielding at uncontrolled pedestrian crossings. RRFBs are most effective on higher-volume or higher-speed roadways, including state highways, where pedestrian crossings are otherwise difficult for drivers to recognize or where yielding compliance is low.

RRFBs enhance pedestrian safety by improving driver awareness and expectancy without introducing full signalization or stopping mainline traffic.

PROBLEM ADDRESSED

On multi-lane roadways and state highways in Bridgeport, pedestrians often experience difficulty crossing due to higher vehicle speeds, longer crossing distances, and limited driver yielding. Standard crosswalk markings alone may not provide sufficient driver awareness or response time, particularly in locations with truck traffic or wide pavement. These conditions increase the risk and severity of pedestrian crashes at unsignalized crossings.

SAFETY ISSUES ADDRESSED

Failure to yield to pedestrians at unsignalized crossings

Limited pedestrian visibility on wide or high-speed roadways

High crash severity risk due to speed and multiple travel lanes

Driver surprise and delayed recognition of pedestrian activity

BENEFITS

Substantially increases driver yielding, often exceeding 80–90% at uncontrolled crossings.[12]

Highly effective on multi-lane roads and state highways where pedestrian crossings are otherwise difficult to recognize.[1]

pedestrian hybrid beacon, FHWA

Improves pedestrian safety without adding traffic signals or unnecessary vehicle delay.

Supports the Safe System Approach by improving visibility, predictability, and driver awareness at pedestrian conflict points.[2]

MUTCD-approved (Interim Approval IA-21) and widely implemented by NDOT on Nebraska state highways.

CONSTRAINTS AND LIMITATIONS

Not a traffic signal: RRFBs do not assign right-of-way; drivers are still required to yield under state law.

Requires pedestrian activation; effectiveness depends on proper placement and visibility.

Higher cost than pavement markings alone and requires electrical or solar power.

Overuse may reduce effectiveness; best reserved for locations with documented pedestrian demand and yielding issues.

NDOT approval required for installation on US highways and within NDOT right-of-way.

TYPICAL APPLICATIONS

Unsignalized pedestrian crossings on US-26 and US-385 through Bridgeport

School routes, park access points, and community facilities

Mid-block crossings with documented pedestrian demand

Multi-lane roadways with truck traffic and limited pedestrian gaps

Locations where high-visibility crosswalk markings alone are insufficient

TARGET LOCATIONS & USERS

Locations: State highways through developed areas

Downtown corridors with pedestrian activity

School and park access crossings

Identified High Injury Network locations

Users: Pedestrians of all ages and abilities

School-aged children and older adults

Drivers on higher-speed or multi-lane facilities

DESIGN CONSIDERATIONS

Placement: Typically installed in advance of the crosswalk on the approach side

Not placed within the intersection itself

Side streets: Installed only where pedestrian crossings occur; not required on both sides unless justified by volumes

Mounting options: Roadside poles, median refuges, or overhead (subject to NDOT approval)

Visibility & spacing: Ensure adequate sight distance for approaching vehicles, including trucks

Power supply: Solar-powered units common in rural Nebraska; require clear sun exposure and maintenance planning

Signage pairing: W11-2 pedestrian warning signs with W16-7P arrow plaques per MUTCD

NDOT coordination: NDOT review required for location selection, mounting configuration, beacon intensity, and maintenance responsibility

ELIGIBILITY

SS4A Eligibility: Eligible as an infrastructure safety countermeasure under SS4A Implementation Grants

Project Type: Targeted pedestrian safety improvement

Jurisdiction: Requires NDOT approval on state-maintained facilities

COST AND TIMEFRAME

Cost: Medium

Timeframe: Short- to mid-term

Maintenance: Ongoing inspection of beacon operation, power systems, and signage

IMPLEMENTATION PARTNERS

City of Bridgeport

Nebraska Department of Transportation (NDOT)

Bridgeport Police Department (yielding compliance support)

Local schools and community facility operators

ROLE IN COUNTERMEASURE TOOLKIT

RRFBs function as an enhanced crossing control and are typically implemented after or alongside high-visibility crosswalk markings. They are most appropriate where pedestrian demand and risk exceed what pavement markings alone can address, particularly on state highways and multi-lane facilities.

ONLINE REFERENCES

MUTCD Interim Approval IA-21 – RRFBs [1] https://mutcd.fhwa.dot.gov/resources/interpretations/ia21/

FHWA – Proven Safety Countermeasures: RRFBs [2] https://safety.fhwa.dot.gov/provencountermeasures/rrfb.cfm

FHWA – Pedestrian Safety Guide [3] https://safety.fhwa.dot.gov/ped_bike/

SS4A & SAFE SYSTEM ALIGNMENT

RRFBs support the Safe System Approach by addressing roadway design and driver awareness at locations where pedestrian exposure and crash severity risk are highest. By increasing yielding compliance without relying solely on enforcement, RRFBs reduce the likelihood and severity of pedestrian crashes on higher-speed roadways.

CM-03 State-Law "Yield to Pedestrians" Signage & Advance Yield Lines

(R1-6/R1-6a)

Advance yield lines paired with state-law pedestrian yield signage move vehicle stopping locations farther upstream of crosswalks, improving sight distance, reducing multiple-threat crashes, and reinforcing driver yielding behavior.

PROBLEM ADDRESSED

At unsignalized pedestrian crossings—particularly on multi-lane roadways, downtown streets with on-street parking, and state highways—drivers often stop too close to the crosswalk or fail to yield altogether. Vehicles stopped at the crosswalk can block sight lines for adjacent lanes, creating multiple-threat crash conditions where pedestrians are hidden from approaching drivers. These conditions are common in Bridgeport's downtown and along US-26 and US-385.

SAFETY ISSUES ADDRESSED

Multiple-threat pedestrian crashes on multi-lane roadways

Failure to yield to pedestrians at unsignalized crossings

Limited sight distance caused by parked or stopped vehicles

Driver uncertainty about stopping location and yielding expectations

BENEFITS

Reduces multiple-threat pedestrian crashes by preventing vehicles in adjacent lanes from obscuring pedestrians.[1]

Improves driver awareness of pedestrian crossings before reaching the crosswalk.

Enhances sight distance between drivers and pedestrians, especially near parked vehicles.

Reinforces state pedestrian right-of-way laws through clear, consistent messaging.

Low-cost, quick-build treatment suitable for both local streets and state highways.

Proven to improve yielding compliance when combined with high-visibility crosswalks.[2]

Why This Works Without Signals

Advance yield lines and state-law signage address pedestrian crash risk by changing where drivers stop, not by increasing control complexity. FHWA identifies this treatment as an effective, low-cost alternative where signals are not warranted and where pedestrian exposure is high.

SS4A Eligibility Note

Advance yield lines and state-law pedestrian signage are eligible SS4A implementation countermeasures when tied to documented yielding failures, exposure risk, and community input. These treatments align with the Safe System Approach by improving visibility, clarifying expectations, and reducing conflict severity.

pedestrian yield signage \ pedbikeimages.org Dan Burden

CONSTRAINTS AND LIMITATIONS

Effectiveness depends on proper placement and driver understanding.

Less effective where operating speeds are high without complementary speed management.

Requires sufficient upstream space between the yield line and the crosswalk.

Must be maintained to ensure markings remain visible over time.

Not intended to replace signals or RRFBs at higher-volume crossings.

TYPICAL APPLICATIONS

Unsignalized crosswalks on multi-lane roadways.

Downtown corridors with on-street parking near intersections.

School routes and locations with frequent pedestrian crossings.

State highways through communities where full signalization is not warranted.

Locations with documented near-misses or yielding failures.

DESIGN CONSIDERATIONS

Yield line placement: Typically 20–50 feet in advance of the crosswalk, measured from the near edge of the crosswalk. Closer spacing (≈20–30 ft) may be appropriate in constrained downtown contexts.

Pavement markings: Use MUTCD-compliant shark's teeth (yield line) markings per MUTCD Section 3B.16.

Signage: Install "STATE LAW – YIELD TO PEDESTRIANS WITHIN CROSSWALK" (R1-6 or R1-6a) signs in advance of or at the yield line.

Integration: Most effective when paired with high-visibility crosswalk markings, parking setbacks, and pedestrian warning signage.

State highway context (NDOT): Placement and spacing must be coordinated with NDOT for crossings on US or state routes.

NDOT generally supports advance yield lines as a non-signal alternative where pedestrian volumes justify enhanced visibility.

Maintenance: Markings should be included in routine striping programs to maintain visibility.

TARGET LOCATIONS & USERS

Locations: Unsignalized crosswalks on multi-lane roadways

Downtown corridors with on-street parking near crossings

School routes and community facilities with frequent pedestrian activity

State highways through developed areas where signals are not warranted

Users: Pedestrians of all ages and abilities

School-aged children and older adults

Drivers on local streets and state highways

ELIGIBILITY

SS4A Eligibility: Eligible as a low-cost infrastructure safety countermeasure under SS4A Implementation Grants

Project Type: Quick-build operational and engineering treatment

Jurisdiction: Requires NDOT coordination and approval on state-maintained highways

COST AND TIMEFRAME

Cost: Low

Timeframe: Short-term (often implemented within routine striping cycles)

Maintenance: Periodic restriping required to maintain visibility

IMPLEMENTATION PARTNERS

City of Bridgeport

Nebraska Department of Transportation (NDOT)

Local schools and community facility operators

Law enforcement (supporting yielding compliance and education)

ROLE IN COUNTERMEASURE TOOLKIT

State-law pedestrian yield signage and advance yield lines serve as an operational enhancement to marked crosswalks and are often implemented where high-visibility markings alone are insufficient. They provide a proven, low-cost alternative to signals or RRFBs at locations with documented yielding failures but moderate pedestrian volumes.

ONLINE REFERENCES

MUTCD (2009 with Revisions) – Section 3B.16, Yield Lines [1] https://mutcd.fhwa.dot.gov/htm/2009/part3/part3b.htm

FHWA – Pedestrian Safety Guide and Countermeasure Selection System [2] https://safety.fhwa.dot.gov/ped_bike/tools_solve/

FHWA – Safety Effects of Marked vs. Unmarked Crosswalks [3] https://safety.fhwa.dot.gov/ped_bike/docs/crosswalks.pdf

FHWA – Proven Safety Countermeasures: Advance Yield Lines [4] https://safety.fhwa.dot.gov/provencountermeasures/adv_yield.cfm

SS4A & SAFE SYSTEM ALIGNMENT

Advance yield lines and state-law pedestrian signage support the Safe System Approach by reducing crash severity and exposure through improved roadway design and clearer driver expectations. By moving vehicle stopping locations upstream of the crosswalk, this countermeasure improves visibility and predictability without relying on increased enforcement or signalization.



CM-04 Enhanced Mid-Block Pedestrian Crossing

Designated pedestrian crossings located between intersections on state highways, using enhanced visibility, warning devices, and refuge features to provide safe, predictable crossing opportunities where pedestrian demand exists outside of intersection locations.

PROBLEM ADDRESSED

On state highways and long corridor segments in Bridgeport, pedestrians often cross mid-block to reach schools, parks, and community destinations because the nearest controlled intersection is too far out of direction of travel. Without a designated crossing, pedestrians may cross unpredictably at locations with limited driver expectancy, creating elevated risk of severe crashes. CM-04 addresses the safety gap between intersections by formalizing mid-block crossing locations where pedestrian demand already exists.

SAFETY ISSUES ADDRESSED

Unsafe informal pedestrian crossings between intersections

Failure to yield at unexpected crossing locations

High crash severity risk due to speed and multi-lane exposure

Long block lengths that discourage use of controlled intersections

Conflicts near schools, parks, and community facilities located mid-block

BENEFITS

Reduces unsafe informal crossings by providing a clearly designated crossing location.[1]

Improves driver awareness and yielding behavior when paired with enhanced treatments (e.g., RRFBs, refuge islands).[1] [2]

Supports school routes, parks, and community destinations located mid-block along state highways.

Aligns with Safe System principles by managing conflict points rather than forcing pedestrians to cross at unsuitable intersections.[2]

Can significantly reduce pedestrian crash risk when properly located and designed.[3]

CONSTRAINTS AND LIMITATIONS

Requires careful site selection; inappropriate placement can increase risk rather than reduce it.

NDOT approval is required for location, design, and installation on US highways.

Not suitable in areas with poor sight distance, steep grades, or uncontrolled high speeds without additional treatments.

Higher cost than basic markings due to need for beacons, lighting, or refuge features.

Must demonstrate documented pedestrian demand or exposure, not convenience alone.

mid-block pedestrian crossing \ FHWA

TYPICAL APPLICATIONS

School routes where the nearest signalized or controlled intersection is too far from pedestrian desire lines.

Community centers, parks, recreation facilities, and campuses located mid-block along highways.

Corridors with long block lengths and frequent informal crossings.

Locations where intersection crossings are constrained by truck movements, rail proximity, or turning conflicts.

DESIGN CONSIDERATIONS

Location selection: Should be placed where pedestrians already cross or where crossing demand is expected (e.g., schools, community facilities).

Avoid locations immediately adjacent to complex intersections or rail crossings unless explicitly approved by NDOT.

Crosswalk markings: Typically 6–8 feet wide in a state highway context unless otherwise approved by NDOT.

Use high-visibility continental or ladder markings.

Warning devices: RRFBs are commonly required on state highways to achieve acceptable yielding rates.

Advance warning signs should be placed in accordance with MUTCD spacing guidance.

Refuge islands (where applicable):

Considered on multi-lane highways to allow staged crossings.

Lighting: Supplemental lighting is strongly recommended for nighttime visibility.

Sight distance: Must meet NDOT stopping sight distance requirements for posted speeds and truck traffic.

Speed context: Most effective where operating speeds are compatible with pedestrian yielding expectations; additional speed management may be required.

TARGET LOCATIONS & USERS

Locations: State highways with long block lengths (US-26 / US-385)

School routes where intersections are not conveniently spaced

Parks, recreation areas, community centers, and campuses

Corridors with documented informal pedestrian crossing activity

Users: School-aged children and youth

Older adults and mobility-limited pedestrians

Community members accessing public facilities

Drivers traveling through developed highway corridors

NDOT coordination: NDOT will review pedestrian volumes, speed data, sight distance, cross-section, and treatment selection.

Final design and placement are subject to NDOT approval and standards.

ELIGIBILITY

SS4A Eligibility: Eligible as an infrastructure safety countermeasure under SS4A Implementation Grants

Project Type: Pedestrian safety and access improvement

Jurisdiction: Requires NDOT approval for location, design, and treatment selection on state highways

COST AND TIMEFRAME

Cost: Medium to High (varies based on inclusion of RRFBs, refuge islands, lighting, and curb work)

Timeframe: Mid-term

Maintenance: Ongoing maintenance of markings, beacons, signage, and lighting

IMPLEMENTATION PARTNERS

City of Bridgeport

Nebraska Department of Transportation (NDOT)

Bridgeport Public Schools and community facility operators

Law enforcement (supporting yielding compliance, where applicable)

ROLE IN COUNTERMEASURE TOOLKIT

Mid-block crossings function as a location-specific crossing solution where intersection-based treatments are not feasible or appropriate. They are typically implemented in combination with CM-01 (high-visibility markings), CM-02 (RRFBs), and CM-03 (advance yield lines) to create a complete, layered crossing treatment on state highways.

ONLINE REFERENCES

FHWA – Proven Safety Countermeasures: Pedestrian Crossing Enhancements [1] https://safety.fhwa.dot.gov/provencountermeasures/

FHWA – Pedestrian Safety Guide and Countermeasure Selection System [2] https://safety.fhwa.dot.gov/ped_bike/tools_solve/ped_scd.cfm

MUTCD – Part 4 & Part 7 (Pedestrian Crossings and School Areas) [3] https://mutcd.fhwa.dot.gov

AASHTO – Guide for the Planning, Design, and Operation of Pedestrian Facilities [4]

NDOT Traffic Engineering & MUTCD Guidance (State Highway Facilities) [5]

SS4A & SAFE SYSTEM ALIGNMENT

Mid-block pedestrian crossings support the Safe System Approach by managing conflict points and reducing exposure at locations where pedestrians already cross. Rather than forcing pedestrians to travel out of direction to distant intersections, this countermeasure provides predictable, well-designed crossing opportunities that improve visibility, reduce surprise, and lower crash severity risk on higher-speed corridors.

CM-05 ADA - Compliant Curb Ramps (PROWAG-Compliant)

Construction of missing sidewalk segments and installation or upgrade of ADA-compliant curb ramps to provide continuous, accessible pedestrian routes and eliminate the need for pedestrians to travel in the roadway.

Why This Is a Safety Countermeasure (Not Just "Infrastructure")

Sidewalk infill and ADA-compliant curb ramps directly address exposure risk, which is a primary SS4A emphasis in communities with limited severe crash history. In Bridgeport, missing or inaccessible sidewalks force pedestrians into vehicle travel lanes along school routes, downtown streets, and park areas. Addressing these gaps reduces the likelihood of severe crashes before they occur.

PROBLEM ADDRESSED

In Bridgeport, missing sidewalk segments and non-compliant curb ramps create gaps in the pedestrian network that force people to walk in the roadway, cross at unmarked locations, or navigate unsafe grades and surfaces. These conditions disproportionately affect people with disabilities, older adults, children, and caregivers, particularly along school routes, downtown streets, and near parks and community facilities. This exposure to vehicle traffic increases the likelihood and severity of pedestrian crashes even in areas with limited documented crash history.

SAFETY ISSUES ADDRESSED

Pedestrian exposure to moving traffic due to missing sidewalks

Inaccessible or non-compliant curb ramps that force unsafe crossing behavior

Increased crash risk for people with disabilities, older adults, and children

Discontinuous pedestrian routes that undermine safe system performance

Equity-related safety gaps affecting mobility-limited users **BENEFITS**

Reduces pedestrian exposure to vehicle traffic by providing a continuous, designated walking space.[1]

Improves safety and mobility for people with disabilities, older adults, children, and caregivers.[2]

Supports equitable access to schools, parks, downtown destinations, and transit stops.

Addresses systemic safety gaps rather than isolated crash locations, aligning with Safe System principles.[3]

Often delivers high safety benefit at relatively low cost, particularly in small communities.[1]

CONSTRAINTS AND LIMITATIONS

Right-of-way width, drainage, utilities, or existing structures may constrain sidewalk placement.

ADA upgrades may require adjustment of grades, curb lines, or adjacent surfaces.

Snow and ice maintenance responsibilities must be clearly defined.

Sidewalk infill alone does not control vehicle speeds and should be paired with complementary measures where needed.

TYPICAL APPLICATIONS

Routes to schools, parks, community centers, and downtown destinations.

Residential corridors where pedestrians currently walk in the roadway due to missing sidewalks.



ADA compliant curb ramps & landings \ MCS concept

Intersections with outdated or non-compliant curb ramps.

Areas identified through equity analysis, public comments, or Safe Routes to School planning.

DESIGN CONSIDERATIONS

Sidewalk width: Typically 5 feet minimum clear width in constrained areas.[1]

Wider sidewalks may be provided near schools, parks, or high pedestrian activity areas.

Curb ramps: Must meet ADA and PROWAG requirements for slope, landing area, detectable warnings, and alignment.[2]

Ramps should align with marked crosswalks wherever feasible.

Surface and grade: Firm, stable, and slip-resistant surfaces.

Cross-slope generally limited to 2% maximum.[2]

Detectable warnings: Truncated dome surfaces required at curb ramps connecting to roadways.

Drainage: Designs must avoid ponding at ramp landings or sidewalk low points.

NDOT coordination (state highway context): Sidewalk and ramp improvements along US highways require NDOT review and approval.

Designs must meet NDOT accessibility, grading, and clear zone requirements.

TARGET LOCATIONS & USERS

Locations: Routes to schools, parks, community centers, and downtown destinations

Residential corridors with missing sidewalk segments

Intersections with outdated or non-compliant curb ramps

State highway corridors within developed areas (with NDOT coordination)

Users: People with disabilities and mobility limitations

Older adults and caregivers with strollers

School-aged children and youth

Pedestrians of all ages using daily walking routes

ELIGIBILITY

SS4A Eligibility: Eligible as an infrastructure safety countermeasure under SS4A Implementation Grants

Project Type: Pedestrian safety and accessibility improvement

Justification: Eligible when tied to exposure risk, public input, equity considerations, and Safe System principles

Jurisdiction: NDOT review and approval required when located on US highways

COST AND TIMEFRAME

Cost: Low to Medium (varies based on length, drainage, and grading complexity)

Timeframe: Short- to mid-term; often implemented incrementally or alongside other projects

Maintenance: Ongoing snow, ice, and surface maintenance responsibilities must be clearly assigned

IMPLEMENTATION PARTNERS

City of Bridgeport

Nebraska Department of Transportation (NDOT)

Bridgeport Public Schools and community facility operators

Panhandle Public Health District or other equity-focused partners

Property owners (where sidewalk easements or coordination are required)

ROLE IN COUNTERMEASURE TOOLKIT

Sidewalk infill and ADA-compliant curb ramps function as a foundational pedestrian safety treatment. They are most effective when paired with crossing enhancements (CM-01 through CM-04), speed management strategies, and school-area safety measures, ensuring that pedestrians can safely reach and use designated crossing locations.

ONLINE REFERENCES

FHWA – Proven Safety Countermeasures: Sidewalks [1] https://safety.fhwa.dot.gov/ped_bike/provencountermeasures/sidewalks.cfm

FHWA – Accessible Public Right-of-Way Guidelines (PROWAG) [2] https://www.access-board.gov/prowag/

MUTCD – Part 3 (Markings at Curb Ramps and Crosswalks) [3] https://mutcd.fhwa.dot.gov

AASHTO – Guide for the Planning, Design, and Operation of Pedestrian Facilities [4]

NDOT Roadway Design Manual & ADA Transition Guidance [5]

SS4A & SAFE SYSTEM ALIGNMENT

ADA-compliant sidewalks and curb ramps directly support the Safe System Approach by reducing pedestrian exposure to vehicle traffic and ensuring the transportation system accommodates human variability. By creating continuous, accessible pedestrian routes, this countermeasure addresses safety proactively—before severe crashes occur—rather than relying on crash history alone.

> ***SS4A Eligibility Note***
>
> *Sidewalk infill and ADA-compliant curb ramp upgrades are explicitly eligible under SS4A Implementation Grants when tied to documented safety risk, public input, and a Safe System approach. Projects prioritize safety outcomes, not general beautification or maintenance.*

CM-06 Sidewalk Infill & ADA Network Completion

Sidewalk infill and ADA-compliant pedestrian route improvements focus on completing and upgrading the curbside pedestrian network along public streets. This countermeasure addresses missing sidewalk segments and non-compliant curb ramps to create continuous, accessible walking routes within the public right-of-way, eliminating the need for pedestrians to travel in vehicle lanes.

Unlike multi-use paths, this countermeasure is intended for urban and neighborhood street environments, where sidewalks are the primary pedestrian facility and direct access to homes, schools, downtown businesses, and civic destinations is required.

PROBLEM ADDRESSED

In Bridgeport, gaps in the sidewalk network and outdated curb ramps create unsafe walking conditions that force pedestrians—particularly children, older adults, and people with disabilities—into the roadway. These exposure risks are most common along school routes, downtown streets, residential corridors, and state highways within developed areas. Without a coordinated approach, sidewalk improvements may occur inconsistently and fail to address the locations with the greatest safety and equity need.

SAFETY ISSUES ADDRESSED

Pedestrian exposure to moving traffic due to missing sidewalks

Inaccessible or non-compliant curb ramps that restrict safe crossing

Unsafe walking conditions along school routes and neighborhood streets

Discontinuous pedestrian networks that undermine Safe System performance

Equity-related accessibility gaps affecting vulnerable users

BENEFITS

Reduces Exposure Risk: Keeps pedestrians out of travel lanes by providing a continuous walking surface.[1]

Improves Accessibility: Ensures sidewalks and curb ramps meet ADA and PROWAG requirements.[2]

Protects Vulnerable Users: Improves safety for children, older adults, caregivers, and people with disabilities.

Systemic Safety Improvement: Addresses network-wide risk rather than isolated crash locations.[3]

Equitable Investment: Prioritizes basic infrastructure in areas lacking safe pedestrian access.

High Benefit-Cost Ratio: Often delivers meaningful safety improvements at relatively low cost.[1]

CONSTRAINTS AND LIMITATIONS

Right-of-way width, drainage, utilities, or existing structures may limit placement.

ADA upgrades may require adjustments to grades, curb lines, or adjacent surfaces.

Snow and ice maintenance responsibilities must be clearly defined.

Sidewalk infill does not control vehicle speeds and should be paired with complementary countermeasures where needed.

Network completion typically occurs incrementally over multiple years.

TYPICAL APPLICATIONS

Routes to schools, parks, downtown destinations, and civic facilities

Residential streets where pedestrians currently walk in the roadway

Intersections with outdated or non-compliant curb ramps

Neighborhoods identified through equity analysis or public input

Developed segments of state highways with curbside pedestrian activity (with NDOT coordination)

TARGET LOCATIONS & USERS

Target Locations: School walk zones and Safe Routes to School corridors

Downtown and commercial streets with curbside access needs

Residential neighborhoods with missing sidewalk segments



sidewalk infill | gap closure | compliant ADA ramps, pedbikeimages.org \ Burden

Connections to public buildings, transit stops, and services

Target Users: School-aged children and youth

Older adults and caregivers

People with disabilities or mobility limitations

Pedestrians making short, local, everyday trips

DESIGN CONSIDERATIONS

Sidewalk Width: Minimum 5-foot clear width in constrained environments.[1]

Wider sidewalks where pedestrian activity is higher (schools, downtown).

Curb Ramps: Must meet ADA and PROWAG standards for slope, landings, alignment, and detectable warnings.[2]

Align ramps with marked crosswalks wherever feasible.

Surface & Grade: Firm, stable, slip-resistant surfaces.

Cross-slope generally limited to 2% maximum.[2]

Drainage: Avoid ponding at ramp landings and sidewalk low points.

State Highway Context: Sidewalk and ramp improvements along US highways require NDOT review.

Designs must meet NDOT clear-zone and accessibility requirements.

ELIGIBILITY

SS4A Eligibility: Eligible as an infrastructure safety countermeasure under SS4A Implementation Grants

Justification: Addresses exposure risk, accessibility, equity, and Safe System objectives

Project Type: Pedestrian safety and accessibility improvement within the public right-of-way

Jurisdiction: NDOT approval required for improvements within state highway right-of-way

COST AND TIMEFRAME

Cost: Low to Medium (varies by segment length, grading, and drainage needs)

Timeframe: Short-term for targeted infill and ramp upgrades

Mid-term for broader network completion

Maintenance: Ongoing sidewalk surface and snow/ice maintenance must be assigned

IMPLEMENTATION PARTNERS

City of Bridgeport (Public Works, Planning, Administration)

Nebraska Department of Transportation (state highway coordination)

Bridgeport Public Schools (school route identification)

Panhandle Public Health District or equity-focused partners

Adjacent property owners, as needed for frontage coordination

ROLE IN COUNTERMEASURE TOOLKIT

CM-06 provides the foundational pedestrian network that allows other safety countermeasures to function effectively. It ensures pedestrians can safely and accessibly reach crossings (CM-01–CM-04) and destinations without traveling in the roadway, while remaining distinct from off-street shared-use paths (CM-07).

ONLINE REFERENCES

FHWA – Proven Safety Countermeasures: Sidewalks [1] https://safety.fhwa.dot.gov/ped_bike/provencountermeasures/sidewalks.cfm

FHWA – Accessible Public Right-of-Way Guidelines (PROWAG) [2] https://www.access-board.gov/prowag/

FHWA – Safe System Approach [3] https://www.transportation.gov/roadway_safety/safe-system

MUTCD – Part 3 (Markings at Curb Ramps and Crosswalks) [4] https://mutcd.fhwa.dot.gov

AASHTO – Guide for the Planning, Design, and Operation of Pedestrian Facilities [5] https://www.transportation.org

NDOT Roadway Design Manual & ADA Transition Guidance [6]

SS4A & SAFE SYSTEM ALIGNMENT

Sidewalk infill and ADA-compliant pedestrian routes support the Safe System Approach by reducing pedestrian exposure to traffic and ensuring the transportation system accommodates human variability. This countermeasure prioritizes prevention by addressing everyday walking risk before severe crashes occur.

Why This Is a Safety Countermeasure (Not Just "Infrastructure")

Sidewalk infill and ADA-compliant curb ramps directly address exposure risk, which is a primary SS4A emphasis in communities with limited severe crash history. In Bridgeport, missing or inaccessible sidewalks force pedestrians into vehicle travel lanes along school routes, downtown streets, and park areas. Addressing these gaps reduces the likelihood of severe crashes before they occur.

CM-07 Shared-Use Path

(Multi-Use Trail)

Multi-use paths (also known as shared-use paths) are paved, bi-directional facilities physically separated from motor vehicle traffic and designed to safely accommodate pedestrians, bicyclists, and other non-motorized users of all ages and abilities. These facilities operate outside the curb line and are intended to provide longer-distance, low-stress travel where on-street sidewalks or bike facilities are not feasible or desirable.

Unlike sidewalks, multi-use paths function as off-street corridors that serve both transportation and recreation purposes while significantly reducing exposure to vehicle traffic.

PROBLEM ADDRESSED

In Bridgeport, some key destinations and corridors—such as parks, recreation areas, school campuses, highway edges, and rural transition zones—lack safe walking and bicycling facilities within the roadway right-of-way. High vehicle speeds, limited shoulder width, rail corridors, or environmental constraints can make traditional sidewalks or bike lanes impractical. Without physically separated facilities, pedestrians and bicyclists face elevated exposure risk and limited mobility options.

SAFETY ISSUES ADDRESSED

Exposure of pedestrians and bicyclists to high-speed vehicle traffic

Lack of safe, low-stress routes for non-motorized users

Barriers to walking and bicycling for children, older adults, and people with disabilities

Discontinuous pedestrian and bicycle networks outside downtown and residential streets

Safety concerns along highway corridors, rail lines, and rural edges

BENEFITS

Reduces Exposure Risk: Physical separation from traffic significantly lowers crash risk.[1]

Universal Accessibility: Provides a stable surface suitable for pedestrians, cyclists, wheelchairs, strollers, and mobility devices.[2]

Encourages Active Transportation: Supports walking and bicycling for both daily trips and recreation.

Recreation & Quality of Life: Offers safe, comfortable routes for exercise and leisure.

Network Connectivity: Links neighborhoods, schools, parks, downtowns, and community facilities.

Economic & Community Benefits: Increased pedestrian and bicycle activity can support local businesses and tourism.

CONSTRAINTS AND LIMITATIONS

Requires sufficient right-of-way and may involve easements or land acquisition.

Shared space can create user conflicts where pedestrian and bicycle volumes are high.

Ongoing maintenance needed for surface condition, vegetation, and snow/ice removal.

Environmental constraints such as drainage, floodplains, or terrain may affect feasibility.

Benefits are reduced if paths do not connect to destinations or the broader network.



multi-use paths | shared-use paths

TYPICAL APPLICATIONS

Community trail networks and longer-distance internal connections

School and park access routes away from local streets

Corridors parallel to highways, rail lines, waterways, or utilities

Tourism and recreation routes serving lakes, trails, and scenic destinations

Areas where sidewalks or bike lanes are impractical due to speed, volume, or geometry

TARGET LOCATIONS & USERS

Target Locations: Highway-adjacent corridors with limited shoulder or sidewalk feasibility

Rail, utility, and waterway corridors

Park-to-park or neighborhood-to-downtown connections

Rural-to-urban transition areas

Target Users: Pedestrians and bicyclists of all ages and abilities

Children and families accessing schools and parks

Older adults and users with mobility devices

Recreational users and active transportation commuters

Design Considerations

Width: Minimum 10 ft in low-volume contexts

Preferred 12–14 ft for moderate use

16–20 ft in high-use areas

Surface: Asphalt or concrete with smooth, durable, ADA-compliant finish

Grades: Gentle slopes consistent with ADA guidance; avoid long, steep grades

Separation from Roadways: Provide horizontal buffer where adjacent to traffic

Greater separation recommended on higher-speed corridors

Intersections & Crossings: MUTCD-compliant markings, signage, and crossing treatments

Lighting: Recommended in urban areas, near schools, and high-use segments

Wayfinding & Signage: Clear guidance for destinations and shared-use expectations

Maintenance Access: Design for snow removal, debris clearance, and maintenance vehicles

ELIGIBILITY

SS4A Eligibility: Eligible as an infrastructure safety countermeasure under SS4A Implementation Grants

Justification: Addresses exposure-based risk, network gaps, and vulnerable user safety

Project Type: Off-street pedestrian and bicycle safety facility

Jurisdiction: Coordination with NDOT required when paths parallel or intersect state highways

COST AND TIMEFRAME

Cost: Medium to High (varies based on length, right-of-way needs, and site conditions)

Timeframe: Mid- to long-term

Maintenance: Ongoing surface, vegetation, and winter maintenance required

IMPLEMENTATION PARTNERS

City of Bridgeport (Planning, Public Works, Parks)

Nebraska Department of Transportation (highway coordination)

Nebraska Game & Parks or State Parks (where applicable)

Property owners and utility providers (for easements and corridor access)

Local schools and recreation providers

ROLE IN COUNTERMEASURE TOOLKIT

CM-07 provides off-street, low-stress travel corridors that complement curbside pedestrian infrastructure (CM-06). While sidewalks serve short, local trips along streets, multi-use paths support longer connections and recreational travel where on-street facilities are not feasible.

ONLINE REFERENCES

FHWA – Shared-Use Path Design Guidance [1] https://www.fhwa.dot.gov/environment/bicycle_pedestrian/

AASHTO – Guide for the Development of Bicycle Facilities (Shared-Use Paths) [2] https://safety.fhwa.dot.gov/ped_bike/

ADA Accessibility Guidelines (PROWAG) [3] https://www.access-board.gov/prowag/

MUTCD – Path/Roadway Crossing Treatments [4] https://mutcd.fhwa.dot.gov

NDOT Roadway Design Manual (Pedestrian & Bicycle Facilities) [5]

SS4A & SAFE SYSTEM ALIGNMENT

Multi-use paths align with the Safe System Approach by removing pedestrians and bicyclists from direct interaction with motor vehicles, particularly in high-speed or constrained corridors. By prioritizing physical separation and accommodating a wide range of users, this countermeasure reduces crash severity risk and supports long-term, equitable mobility.

CM-08 Pedestrian Sidepaths & Shoulder Facilities

A pedestrian sidepath is a hard-surface path located adjacent to a roadway, used in place of a sidewalk in constrained or transitional corridors to provide a buffered walking facility and, in some cases, limited shared use with bicycles.

PROBLEM ADDRESSED

In Bridgeport, some corridors lack sufficient right-of-way, drainage infrastructure, or curb-and-gutter systems to support traditional sidewalks, while full shared-use paths are not feasible or warranted. In these locations, pedestrians often walk along roadway shoulders or in the travel lane, increasing exposure to moving traffic—particularly along transitioning rural-to-urban corridors, collectors, and state highways. CM-08 addresses these gaps by providing a safer, defined pedestrian facility adjacent to the roadway where other options are constrained.

SAFETY ISSUES ADDRESSED

Pedestrian exposure to moving traffic along shoulders or travel lanes

Lack of defined walking space in transitional or constrained corridors

Unsafe walking conditions along collector and arterial roadways

Increased crash severity risk due to speed and limited separation

Inconsistent pedestrian accommodation outside downtown and residential areas

BENEFITS

Improved pedestrian safety:

Provides separation from moving traffic, reducing exposure compared to shoulder walking or travel-lane use.

Accessibility: Offers a smooth, continuous surface suitable for pedestrians of all ages and abilities, including strollers and mobility devices.

Right-of-way efficiency: Requires less space than a full multi-use path and less infrastructure than curb-and-gutter sidewalks.

Cost-effective implementation: Typically lower construction cost than sidewalks with curb, gutter, and drainage systems.

Flexibility in transitional areas: Well-suited for corridors evolving from rural to urban conditions where permanent sidewalk construction may not yet be warranted.

CONSTRAINTS AND LIMITATIONS

Potential user conflicts: May attract bicyclists if on-street bicycle facilities are absent, increasing the risk of pedestrian–bicycle conflicts.

Intersection safety considerations: Sidepath crossings can be less expected by drivers than sidewalks and require careful crossing design.

SS4A Eligibility Note

Pedestrian sidepaths are SS4A-eligible infrastructure countermeasures when used to reduce pedestrian exposure, address documented walking behavior, and provide safe, accessible facilities in corridors where sidewalks are not currently feasible.



pedestrian facilities

pedestrian sidepaths | shoulder pedestrian facilities
pedbikeimages.org \ Burden

Maintenance requirements: Requires routine maintenance to address debris, surface deterioration, and vegetation encroachment.

Connectivity challenges: May not seamlessly connect to sidewalk networks or existing trail systems without additional transition treatments.

Limited suitability in high-volume contexts: Not appropriate for locations with high pedestrian and bicycle volumes unless designed to shared-use standards.

TYPICAL APPLICATIONS

Interim pedestrian treatment: Used as a transitional facility where future sidewalks or multi-use paths are planned but not yet feasible.

Roadways with bicycle facilities: Applied where adjacent on-street bicycle lanes or shoulders exist and a shared pedestrian facility is acceptable.

Urbanizing corridors: Common along collector or arterial roadways transitioning from rural to urban development patterns.

Constrained right-of-way areas: Suitable where sidewalks are not practical due to drainage, utilities, or limited width.

DESIGN CONSIDERATIONS

Width: Pedestrian-focused sidepath: 5–8 feet. Shared pedestrian/bicycle use: 10–12 feet minimum

Separation from roadway: Provide horizontal separation using grass strips, gravel buffers, or physical barriers rather than curb-and-gutter.

Intersection treatments: Design crossings with high-visibility markings, appropriate signage, and signalization where warranted.

Accessibility: Must meet ADA / PROWAG requirements, including cross slope, running slope, and surface continuity.

Signage and wayfinding: Clearly indicate shared-use conditions and expected user behavior.

Drainage: Ensure positive drainage to prevent ponding or icing on the path surface.

Lighting: Provide pedestrian-scale lighting in areas with nighttime use or reduced visibility.

Landscaping: Incorporate vegetation for comfort and aesthetics while maintaining clear sight lines and usable width.

Agency coordination: Sidepaths adjacent to state highways must be coordinated with NDOT and meet applicable roadway and access management standards.

TARGET LOCATIONS & USERS

Target Locations: Collector and arterial roadways transitioning from rural to urban context

Corridors with constrained right-of-way or limited drainage infrastructure

State highways with documented pedestrian activity but no sidewalk network

Locations where sidewalks or shared-use paths are not feasible in the near term

Target Users: Pedestrians of all ages and abilities

Children and families walking along neighborhood edges

Older adults and mobility-limited users

Occasional bicyclists where on-street bicycle facilities are present

ELIGIBILITY

SS4A Eligibility: Eligible as an infrastructure safety countermeasure under SS4A Implementation Grants

Justification: Addresses exposure-based risk and provides a safer walking alternative in constrained corridors

Project Type: Adjacent pedestrian facility within roadway right-of-way

Jurisdiction: Coordination and approval required for installations along state highways

COST AND TIMEFRAME

Cost: Low to Medium (typically less than curb-and-gutter sidewalks or off-street shared-use paths)

Timeframe: Short- to mid-term; suitable for phased or interim implementation

Maintenance: Routine surface maintenance, vegetation control, and winter upkeep required

IMPLEMENTATION PARTNERS

City of Bridgeport (Public Works, Planning)

Nebraska Department of Transportation (state highway coordination)

Property owners or utility providers (where adjacent coordination is needed)

Local schools or community facilities (where pedestrian demand exists)

ONLINE REFERENCES

FHWA – Sidewalks and Shared Use Paths [1] https://www.fhwa.dot.gov/environment/bicycle_pedestrian/

FHWA – Designing for Pedestrian Safety on Roadways [2]

AASHTO – Guide for the Development of Bicycle Facilities [3]

NDOT Roadway Design Manual – Shared-Use and Adjacent Path Guidance [4]

PROWAG (Public Right-of-Way Accessibility Guidelines) [5]

SS4A & SAFE SYSTEM ALIGNMENT

Pedestrian sidepaths support the Safe System Approach by reducing pedestrian exposure to vehicle traffic in corridors where full separation is not feasible. By providing a defined, accessible walking space adjacent to the roadway, this countermeasure improves predictability and reduces crash severity risk without relying on behavioral compliance alone.



Why Setbacks Instead of Full Curb Extensions

Parking setbacks achieve many of the safety benefits of curb extensions—improved visibility and reduced conflict—without requiring drainage modifications, curb reconstruction, or long-term NDOT capital investment. This makes them an ideal SS4A quick-build strategy.

SS4A Eligibility Note

Parking setback implementation qualifies as an SS4A implementation action when tied to documented pedestrian exposure, near-miss conflicts, and corridor safety priorities. The treatment advances Safe System principles by reducing conflict severity and improving visibility without increasing complexity.

parking setbacks

CM-09 Parking Setbacks at Intersections

(Sight Distance Management)

Parking setbacks at intersections restrict on-street parking near corners to improve sight distance between drivers, pedestrians, and cyclists, reducing near-miss conflicts and intersection crash risk.

PROBLEM ADDRESSED

On-street parking near intersections can block sight lines between drivers, pedestrians, and bicyclists, particularly at unsignalized crossings and downtown corners. In Bridgeport, this limited visibility contributes to near-miss conflicts, delayed yielding, and multiple-threat crash conditions, where a stopped or parked vehicle obscures a pedestrian from an adjacent travel lane. These issues are most pronounced in downtown areas, along state highways through the community, and on school routes.

SAFETY ISSUES ADDRESSED

Limited sight distance between drivers and pedestrians at intersections

Multiple-threat pedestrian crash risk on multi-lane roadways

Turning conflicts caused by blocked visibility

Driver surprise at unsignalized crossings

Near-miss conflicts not always reflected in crash history

BENEFITS

Improves visibility of pedestrians entering crosswalks and drivers approaching intersections.

Reduces right-turn and left-turn conflicts caused by parked vehicles blocking sight lines.

Addresses multiple-threat crash risk by improving inter-lane visibility.

Low-cost, quick-build treatment using striping, signage, and enforcement.

Especially effective when paired with high-visibility crosswalks and advance yield lines.

Can be implemented incrementally and adjusted based on observed conditions.

CONSTRAINTS AND LIMITATIONS

May reduce a small number of on-street parking spaces near intersections.

Requires clear marking and enforcement to remain effective over time.

Must be coordinated with curb ramps, drainage, and existing curb geometry.

In constrained downtown environments, setback distances may need adjustment to balance access and visibility.

On state highways, setback locations must align with NDOT guidance and approval.

TYPICAL APPLICATIONS

Downtown corridors with on-street parking near crosswalks and intersections.

Unsignalized intersections with documented near-misses or visibility complaints.

State highways passing through communities where pedestrian activity is present.

School routes and locations with frequent turning movements.

Locations where curb extensions are not feasible in the near term.

DESIGN CONSIDERATIONS

Setback distance: Typical minimum: 20 feet from the curb return.

Expanded setbacks of 25–30 feet recommended where pedestrian volumes are higher, crosswalks are present, or turning speeds are elevated.

State highway context (NDOT): Setback distances should be coordinated with NDOT for crossings along US-26 / US-385.

NDOT generally supports parking restrictions near intersections to maintain sight distance and operational safety.

Marking & signing: Use curb paint, striping, and/or "No Parking" signage as appropriate.

Ensure markings remain visible year-round, including during winter conditions.

Integration: Most effective when paired with:

High-visibility crosswalks

Advance yield lines

State-law pedestrian yield signage

Accessibility: Ensure setback areas do not interfere with ADA curb ramps or pedestrian clear space.

Enforcement: Setbacks should be supported by a clear traffic control order or parking regulation for enforceability.

TARGET LOCATIONS & USERS

Target Locations: Downtown intersections with on-street parking near corners

Unsignalized crossings on US-26 and US-385 through Bridgeport

School routes with frequent turning movements

Locations with documented visibility complaints or observed conflicts

Intersections where curb extensions are not feasible in the near term

Target Users: Pedestrians of all ages and abilities

School-aged children and older adults

Drivers making turning movements at intersections

Bicyclists approaching or crossing at intersections

ELIGIBILITY

SS4A Eligibility: Eligible as a low-cost infrastructure safety countermeasure under SS4A Implementation Grants

Project Type: Quick-build operational and geometric safety improvement

Jurisdiction: NDOT coordination and approval required on state-maintained highways

COST AND TIMEFRAME

Cost: Low

Timeframe: Short-term; can often be implemented through striping and signage updates

Maintenance: Periodic repainting and enforcement needed to maintain effectiveness

IMPLEMENTATION PARTNERS

City of Bridgeport (Public Works, Planning, Enforcement)

Nebraska Department of Transportation (state highway coordination)

Morrill County Sheriff's Office (parking enforcement and compliance)

Local businesses and property owners (downtown coordination)

ONLINE REFERENCES

MUTCD – Parking Prohibitions Near Intersections (Section 2B & 3B) [1] https://mutcd.fhwa.dot.gov

FHWA – Pedestrian Safety Guide and Countermeasure Selection System [2] https://safety.fhwa.dot.gov/ped_bike/tools_solve/

FHWA – Proven Safety Countermeasures: Intersection Visibility Improvements [3] https://safety.fhwa.dot.gov/provencountermeasures/

AASHTO – Green Book (Sight Distance at Intersections) [4] https://www.transportation.org

SS4A & SAFE SYSTEM ALIGNMENT

Parking setbacks support the Safe System Approach by reducing conflict severity and improving visibility at intersections where pedestrian exposure is high. By addressing sight distance proactively—rather than relying on enforcement or signals—this countermeasure reduces the likelihood of severe crashes while maintaining simple, predictable intersection operations.

ROLE IN COUNTERMEASURE TOOLKIT

CM-09 functions as a corner-specific visibility treatment that manages sight distance at intersections.

CM-09: Manages parked-vehicle obstructions at corners

CM-10: Addresses physical obstructions such as vegetation, utilities, and structures

CM-11: Improves nighttime visibility through targeted lighting

Parking setbacks are often implemented before or instead of curb extensions and work best when paired with high-visibility crosswalks (CM-01) and advance yield lines (CM-03).

CM-10 Intersection Sight Distance Management

Manages vegetation, landscaping, signage, and other physical obstructions within the public right-of-way to preserve sight distance for drivers, pedestrians, and cyclists while supporting community landscaping and urban forestry goals.

PROBLEM ADDRESSED

Vegetation, landscaping, signage, utilities, and street furniture located within intersection and driveway sight triangles can block visibility between drivers, pedestrians, and bicyclists. In Bridgeport, seasonal vegetation growth, mature trees, temporary objects, and incremental additions within the public right-of-way can gradually degrade sight distance, increasing near-miss conflicts and crash risk—particularly at intersections, school zones, and pedestrian crossings. These risks often develop over time and may not be captured by crash history alone.

SAFETY ISSUES ADDRESSED

Restricted sight distance at intersections and driveways

Delayed detection of pedestrians and bicyclists

Turning conflicts caused by blocked visibility

Seasonal and incremental safety degradation

Near-miss conditions not reflected in crash data

BENEFITS

Improved Safety: Enhances visibility at intersections, driveways, and crossings, reducing turning and crossing conflicts.

Supports Vulnerable Users: Improves a driver's ability to detect pedestrians and bicyclists earlier, particularly children and older adults.

Low-Cost, High-Impact: Often achievable through maintenance practices rather than capital construction.

Policy Consistency: Aligns with AASHTO sight distance principles and FHWA Safe System emphasis on proactive risk reduction.

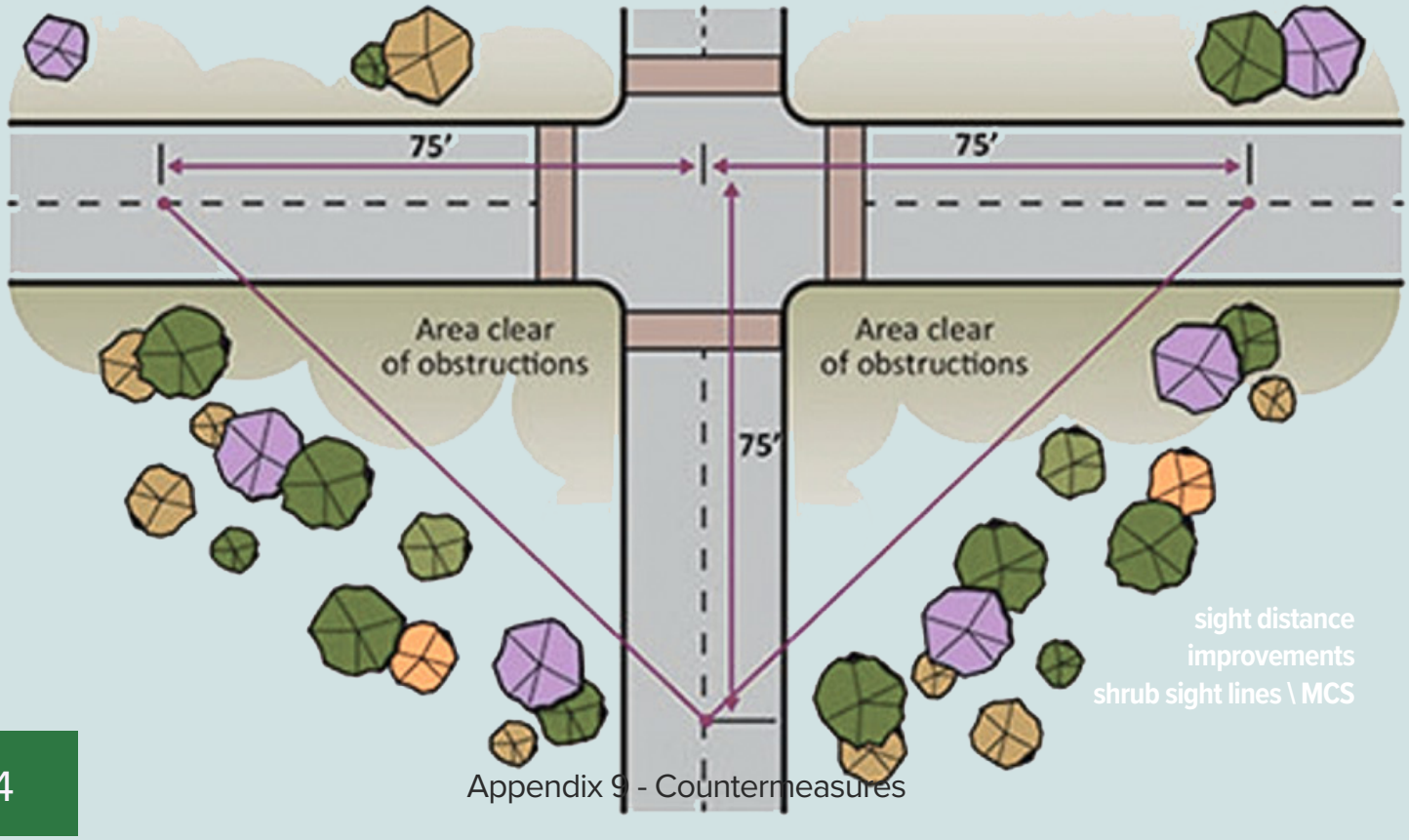
Community Compatibility: Allows trees and landscaping to coexist with safety when properly located and maintained.

CONSTRAINTS AND LIMITATIONS

Ongoing Maintenance: Requires routine inspection and trimming to prevent regrowth or new obstructions.

Coordination Needs: Involves multiple stakeholders (Public Works, Planning, Tree Board, property owners).

improve sight distance



sight distance improvements
shrub sight lines \ MCS

Seasonal Variability: Vegetation growth cycles can change sight distance over time.

Urban Constraints: Utilities, signage, and street furniture may limit available clear space.

Behavioral Limits: Does not address unsafe driving behavior directly.

TYPICAL APPLICATIONS

Intersection corners with limited sight distance.

School zones, park frontages, and pedestrian crossings.

Downtown areas with planters, trees, café seating, or signage near corners.

Driveway approaches with restricted visibility.

State highway crossings and approaches within city limits (with NDOT coordination).

DESIGN CONSIDERATIONS

Sight Triangles: Maintain clear sight triangles per AASHTO Green Book guidance for intersections and driveways.

Vegetation Height Limits: Establish and enforce maximum vegetation heights within corner visibility zones (e.g., low plantings that do not exceed driver eye height).

Tree Placement: Coordinate tree species, spacing, and planting locations to preserve canopy goals without blocking visibility.

ROW Management: Ensure signs, utility cabinets, planters, and street furniture do not encroach into visibility areas.

Maintenance Protocols: Implement scheduled trimming and inspection cycles, especially during peak growing seasons.

Policy Integration: Coordinate with Tree Board policies and municipal code provisions to balance safety and urban forestry objectives.

State Coordination: For state highways, align vegetation management practices with NDOT standards and approval processes.

TARGET LOCATIONS & USERS

Target Locations: Intersection corners with vegetation or street furniture near curb returns

School zones, park frontages, and pedestrian crossing approaches

Downtown areas with trees, planters, café seating, or signage near corners

Driveway approaches with restricted sight distance

State highway crossings and approaches within city limits (with NDOT coordination)

TARGET USERS

Pedestrians of all ages and abilities

School-aged children and older adults

Drivers making turning and crossing movements

Bicyclists traveling through intersections and driveways

ELIGIBILITY

SS4A Eligibility: Eligible as a systemic, low-cost infrastructure and operations safety countermeasure under SS4A Implementation Grants

Project Type: Maintenance, policy, and operational safety improvement

Jurisdiction: NDOT coordination required for vegetation and obstruction management within state highway right-of-way

COST AND TIMEFRAME

Cost: Low

Timeframe: Short-term for initial improvements; ongoing for maintenance

Maintenance: Requires routine inspection and trimming schedules, particularly during peak growing seasons

IMPLEMENTATION PARTNERS

City of Bridgeport Public Works

City Planning Department

Bridgeport Tree Board / Urban Forestry Program

Nebraska Department of Transportation (state highway coordination)

Adjacent property owners (where visibility affects private frontage)

ONLINE REFERENCES

AASHTO – A Policy on Geometric Design of Highways and Streets (Green Book)

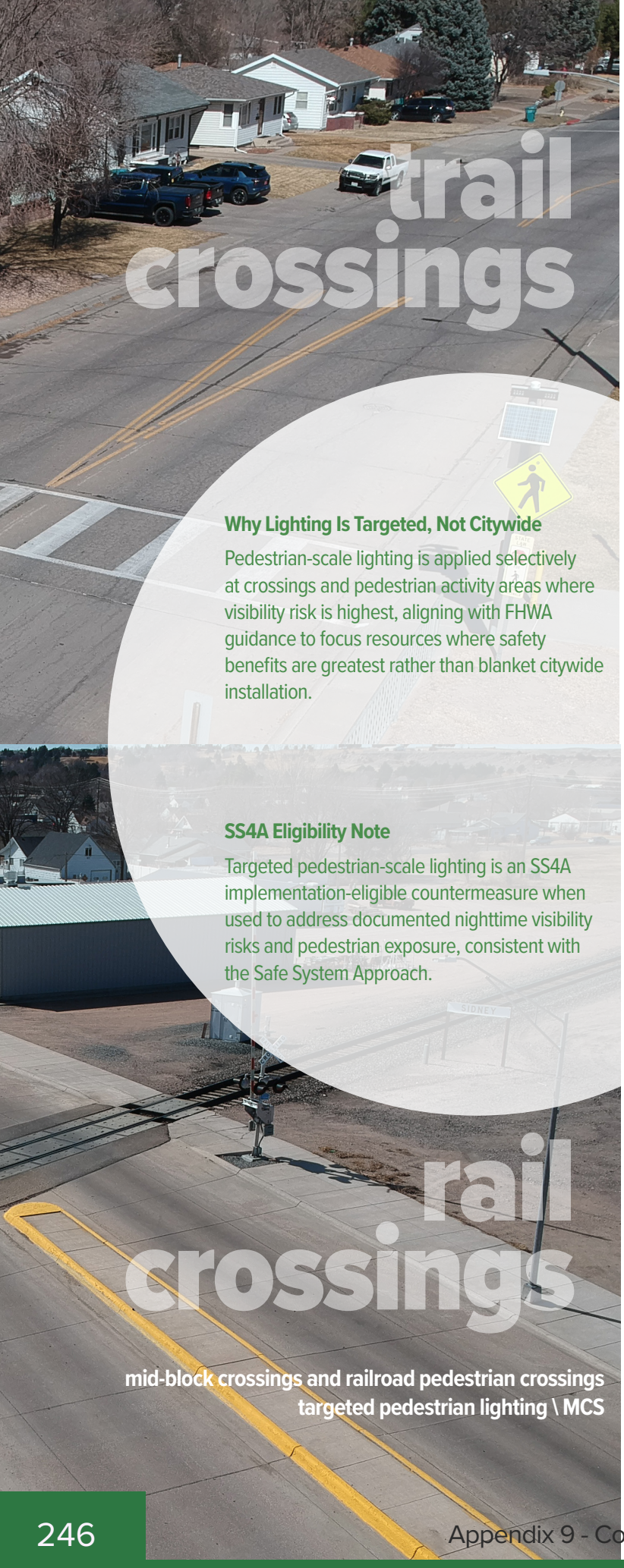
[1] FHWA – Intersection Sight Distance [1] https://safety.fhwa.dot.gov/tools/data_tools/mirereport/section2.cfm

FHWA – Safe System Approach [2] https://www.transportation.gov/road-safety/safe-system

MUTCD – Traffic Control Devices and Visibility [3]

SS4A & SAFE SYSTEM ALIGNMENT

Sight distance improvements support the Safe System Approach by proactively managing roadway conditions that contribute to crashes, rather than relying on user behavior or enforcement alone. By maintaining clear visibility at conflict points, this countermeasure reduces crash likelihood and severity—particularly for vulnerable users—while supporting predictable, forgiving roadway design.



Why Lighting Is Targeted, Not Citywide

Pedestrian-scale lighting is applied selectively at crossings and pedestrian activity areas where visibility risk is highest, aligning with FHWA guidance to focus resources where safety benefits are greatest rather than blanket citywide installation.

SS4A Eligibility Note

Targeted pedestrian-scale lighting is an SS4A implementation-eligible countermeasure when used to address documented nighttime visibility risks and pedestrian exposure, consistent with the Safe System Approach.

mid-block crossings and railroad pedestrian crossings
targeted pedestrian lighting \ MCS

CM-11 Targeted Pedestrian -Scale Lighting

Pedestrian-scale lighting improves nighttime safety and comfort by illuminating crosswalks, sidewalks, and pedestrian activity areas to enhance visibility for both pedestrians and drivers in low-light conditions.

PROBLEM ADDRESSED

Reduced visibility during nighttime and low-light conditions makes it difficult for drivers to detect pedestrians waiting to cross or traveling through intersections and crosswalks. In Bridgeport, limited ambient lighting, seasonal darkness, and isolated activity areas increase the risk of nighttime pedestrian crashes and near-miss conflicts—particularly at crossings along state highways, downtown streets, school-adjacent areas, and park frontages. These risks are often underrepresented in crash data but present consistent exposure concerns.

SAFETY ISSUES ADDRESSED

Limited nighttime visibility of pedestrians at crossings and intersections

Delayed driver detection and reaction in low-light conditions

Increased crash severity risk during evening and winter hours

Pedestrian discomfort and avoidance of poorly lit routes

Near-miss conflicts not always reflected in reported crash history

BENEFITS

Enhanced safety: Improves visibility of pedestrians waiting to cross and pedestrians within the crosswalk.

Increases driver awareness, reducing the risk of nighttime pedestrian crashes.

Increased comfort and security: Creates a safer, more welcoming environment in dimly lit or isolated areas.

Improved navigation: Clearly illuminates sidewalks, crosswalks, curb ramps, and obstacles.

Supports extended activity hours: Enables safe pedestrian travel during evening events, winter months, and low-light periods.

CONSTRAINTS AND LIMITATIONS

Cost: Installation, electrical service, and long-term maintenance can be costly, particularly for permanent fixtures.

Maintenance requirements: Fixtures require regular inspection to maintain light output and reliability.

Obstructions: Trees, signage, awnings, or other infrastructure may block light distribution if not properly coordinated.

Right-of-way constraints: Limited sidewalk width or underground utilities may restrict pole placement.

Potential glare: Poorly aimed or overly bright fixtures can create glare for drivers if not properly designed.

TYPICAL APPLICATIONS

High-priority pedestrian locations, including:

Crosswalks and intersections

Sidewalks with nighttime pedestrian activity

Transit stops and park frontages

Locations with documented need, such as:

≥20 nighttime pedestrians per hour

Areas with a history of nighttime pedestrian crashes

Crossings with unexpected pedestrian activity on higher-speed roadways

Downtown, school-adjacent, park-adjacent, and community facility areas where nighttime use is common.

DESIGN CONSIDERATIONS

Targeted (not blanket) deployment: Lighting should focus on crossings and pedestrian conflict points rather than full corridor illumination.

Fixture selection: Use pedestrian-scale luminaries (lower mounting heights than roadway lighting).

Consider LED or solar-powered fixtures for energy efficiency.

Placement and aiming: Illuminate pedestrians from the driver's approach side to enhance visibility.

Avoid placing fixtures where trees or signs will obstruct light output.

Compatibility with other treatments: Most effective when paired with high-visibility crosswalks, advance yield lines, or RRFBs.

NDOT coordination (state highways): Lighting designs must meet NDOT standards and be coordinated where located along state routes.

Light quality: Balance brightness and color temperature to minimize light pollution while maintaining visibility.

TARGET LOCATIONS & USERS

Target Locations: Marked crosswalks and intersections with nighttime pedestrian activity

State highway crossings within developed areas

Downtown streets and commercial areas with evening activity

School-adjacent and park-adjacent corridors used after dark

Transit stops and pedestrian generators with limited ambient lighting

Target Users: Pedestrians of all ages and abilities

School-aged children and youth attending evening activities

Older adults and mobility-limited users

Drivers navigating crossings in low-light conditions

ELIGIBILITY

SS4A Eligibility: Eligible as an infrastructure safety countermeasure under SS4A Implementation Grants

Project Type: Targeted pedestrian visibility and safety improvement

Jurisdiction: NDOT coordination required for lighting installations along state highways

COST AND TIMEFRAME

Cost: Medium (varies based on fixture type, power source, and electrical service needs)

Timeframe: Short- to mid-term; targeted installations can often be phased

Maintenance: Ongoing fixture inspection, bulb or module replacement, and vegetation coordination

IMPLEMENTATION PARTNERS

City of Bridgeport (Public Works, Planning)

Nebraska Department of Transportation (state highway coordination)

Local electric utility or lighting contractor

Parks, schools, and community facility operators (site coordination)

ONLINE REFERENCES

FHWA – Lighting for Pedestrian Safety [1] https://safety.fhwa.dot.gov/ped_bike/tools_solve/fhwasa0407/

FHWA – Proven Safety Countermeasures [2] https://safety.fhwa.dot.gov/provencountermeasures/

MUTCD – Illumination and Traffic Control Guidance [3] https://mutcd.fhwa.dot.gov

AASHTO – Roadway Lighting Design Guide [4] https://store.transportation.org

NDOT – Roadway and Intersection Lighting Standards [5]

NDOT Roadway Design Manual [6]

SS4A & SAFE SYSTEM ALIGNMENT

Targeted pedestrian lighting supports the Safe System Approach by improving visibility at locations where pedestrian exposure and crash severity risk increase after dark. By enhancing driver detection and pedestrian conspicuity without adding operational complexity, this countermeasure reduces the likelihood and severity of nighttime crashes and supports predictable, forgiving roadway environments.

CM-12 Speed Feedback Display Signs

A radar-based sign that detects and displays an approaching driver's speed (e.g., "YOUR SPEED XX")—often paired with an existing Speed Limit sign—to encourage voluntary speed reduction at targeted locations such as school zones, park areas, and speed transitions.

PROBLEM ADDRESSED

Operating speeds that exceed posted limits—particularly on neighborhood streets, school-route approaches, park frontages, and speed transition zones—increase crash risk and severity for pedestrians, bicyclists, and motorists. In Bridgeport, speeding concerns are frequently reported in locations where physical separation is limited and where traditional enforcement resources are constrained. Speed feedback signs address these risks by encouraging voluntary speed reduction at targeted locations before conflicts occur.

SAFETY ISSUES ADDRESSED

Excessive operating speeds in areas with pedestrian and bicycle activity

Elevated crash severity risk due to higher vehicle speeds

Driver inattention or unawareness of speed, particularly in transition zones

Speeding on neighborhood streets not always reflected in crash history

Limited enforcement capacity for sustained speed control

BENEFITS

Reduces operating speeds on approach to sensitive areas; multiple studies report average speed reductions on the order of a few mph (commonly cited ranges include ~2–10 mph depending on context and duration).[123]

Supports the Safe System approach by reducing kinetic energy and the severity of crashes where conflicts occur (school routes, parks, crossings, narrow streets).[2]

Useful as a quick-build treatment that can be deployed rapidly, moved, and adjusted based on observed performance (portable units).

Can improve compliance in speed transition zones (entering town, approaching schools/parks, approaching downtown).[2]

Many units support data logging, providing before/after speed distributions (including 85th percentile speeds) to support program evaluation and future design decisions.[2]



speed feedback signage / MCS concept

CONSTRAINTS AND LIMITATIONS

Diminishing effectiveness over time if left in the same location continuously; performance typically improves with rotation and targeted deployment.[245]

No direct enforcement capability (unlike automated enforcement); effectiveness relies on driver behavior and—if needed—supplemental enforcement/education.[4]

Limited influence area: strongest impact is typically localized near the sign; may not carry through a full corridor unless deployed as part of a broader speed management program.[45]

Visibility and reliability can be reduced by glare, snow, dirt, fog, or poor placement (height/offset/angle).[5]

Power/maintenance requirements: portable units require charging/battery management; permanent units have higher upfront cost and ongoing maintenance needs.[6]

Jurisdiction constraints: placement within NDOT right-of-way (e.g., US-26/US-385) typically requires NDOT review/approval and compliance with NDOT traffic control and sign support standards.

TYPICAL APPLICATIONS

School zones and school-route approaches (arrival/dismissal peaks).

Park areas and recreation destinations with children/families present.

Neighborhood streets with speeding complaints and limited separation between pedestrians and vehicles.

Speed transition points (entering town, entering downtown context, approaches to curves/hills).[2]

Locations where the 85th percentile speed exceeds the posted limit by a meaningful margin (commonly used screening trigger: ≥5 mph over).[2]

DESIGN CONSIDERATIONS

Confirm posted speed authority and basis: Use speed studies/engineering

judgment to confirm that posted limits are supportable and credible (and revise if needed) before relying on feedback signs.[2]

Reinforce that the sign supports voluntary compliance; it does not replace enforceable speed regulations.

MUTCD consistency: Deploy in a manner consistent with MUTCD provisions for Speed Limit signing and driver feedback signs (typically used with or near the Speed Limit (R2-1) sign, not as a standalone "speed limit").[2]

Ensure sign message, brightness, and layout do not create confusion with regulatory devices; keep displays simple and legible.

NDOT coordination (when on state highways / within NDOT ROW): NDOT should be engaged during concept development for any placement on US-26/US-385 or other state-maintained facilities to confirm ROW permission, sign support requirements, offset/clear zone, and maintenance responsibility.

Placement & visibility: Place where drivers have time to perceive and react (generally on approach to the area of concern, not after it).[8]

Avoid placing where the sign competes with complex decision points (e.g., too close to major intersections, heavy driveway density) unless the intent is specifically an intersection approach.

Typical mounting height guidance is commonly cited in the 5–7 ft range in urban contexts (confirm based on specific sign/unit and roadway context).[7]

Operational strategy (to prevent "sign fatigue"): Rotate portable units among priority locations (e.g., school routes, park streets, problem corridors) and use time-limited deployments.[2] [4] [5]

Define a clear activation threshold (e.g., display only above X mph or above posted limit), so the message remains meaningful and reduces "always-on" desensitization.

Data and evaluation: Use built-in data logging (if available) to track before/after distributions, 85th percentile speed, peak-hour behavior, and persistence of effects.[2]

Pair with targeted messaging (school/park safety campaigns) or limited enforcement waves where appropriate.

TARGET LOCATIONS & USERS

Target Locations: Neighborhood streets with documented speeding concerns

Approaches to school zones and school routes (non-regulatory segments)

Park frontages and recreation corridors

Speed transition areas (entering town, entering downtown, approaching curves or activity centers)

Corridors where the 85th percentile speed exceeds the posted limit by a meaningful margin

Target Users: Drivers traveling through residential and community areas

Pedestrians and bicyclists exposed to vehicle speeds

School-aged children, families, and older adults in proximity to roadways

ELIGIBILITY

SS4A Eligibility: Eligible as an infrastructure safety countermeasure under SS4A Implementation Grants

Project Type: Speed management and behavior-influencing device

Jurisdiction: NDOT coordination and approval required for placement within state highway right-of-way

COST AND TIMEFRAME

Cost: Low to Medium

Portable units: lower upfront cost, flexible deployment

Permanent units: higher upfront cost with ongoing maintenance

Timeframe: Short-term; devices can be deployed rapidly and adjusted based on performance

Maintenance: Battery management (portable units), periodic inspection, and data downloads as applicable

IMPLEMENTATION PARTNERS

City of Bridgeport (Public Works, Planning)

Morrill County Sheriff's Office (coordination with targeted enforcement or education)

Nebraska Department of Transportation (state highway coordination)

Local schools, parks, or community facility operators (site coordination)

ONLINE REFERENCES

[1] *FHWA – Speed Management Guide (program context, effectiveness, placement considerations)* https://highways.dot.gov/sites/fhwa.dot.gov/files/2022-06/speedmanagementguide.pdf

[2] *FHWA – Speed Management Reference Materials (engineering, behavioral effectiveness, rural and urban contexts)* https://safety.fhwa.dot.gov/speedmgt/

[3] *NHTSA – Countermeasures That Work: Dynamic Speed Display Signs (behavioral impacts, limitations, best practices)* https://www.nhtsa.gov/book/countermeasures-that-work

[4] *Iowa State University / InTrans – Traffic Calming in Small and Rural Communities (speed reduction ranges and durability of effects)* http://www.intrans.iastate.edu/reports/traffic-calming-rural.pdf

[5] *Supplemental Practitioner Guidance (applied using engineering judgment, MUTCD consistency, and NDOT standards): Manufacturer documentation and practitioner resources addressing mounting height, placement, visibility, and operational considerations for radar speed feedback signs.*

SS4A & SAFE SYSTEM ALIGNMENT

Speed feedback signs support the Safe System Approach by reducing operating speeds and, therefore, the kinetic energy involved in crashes. By influencing driver behavior at locations with elevated exposure risk—without relying solely on enforcement—this countermeasure helps reduce crash severity and supports safer speeds in community contexts.

CM-13 School Zone Speed Management & Signing

A coordinated set of regulatory signs, pavement markings, flashing beacons, and operational measures used to clearly define school zones, communicate reduced speeds, and improve driver compliance during student arrival and dismissal periods.

SAFETY ISSUES ADDRESSED

Excessive vehicle speeds during school arrival and dismissal

Driver confusion about where school zones begin and end

Limited driver awareness of reduced-speed periods

Conflicts at student crossings, bus loading zones, and campus access points

Target Locations & Users

TARGET LOCATIONS

School frontage streets and immediate approaches

Designated school zones on local and state roadways

Streets with bus loading zones or frequent student crossings

Routes identified through Safe Routes to School planning

BENEFITS

Reduces vehicle speeds in areas with high concentrations of child pedestrians, lowering crash severity risk.[1]

Improves driver awareness and compliance through consistent, highly recognizable school zone treatments.[2]

Enhances safety at crossings, loading zones, and campus access points.

Supports Safe Routes to School objectives and SS4A exposure-based prioritization.

Can be implemented incrementally and combined with operational programs (e.g., crossing guards).



Why Signing Still Matters

School zone speed and signing treatments are foundational safety measures that define legal operating conditions, support enforcement, and improve driver expectancy. In communities like Bridgeport—where exposure risk is high but severe crash history is limited—clear school zone definition is a critical preventive safety action under the SS4A framework.

SS4A Eligibility Note

School zone speed and signing treatments are explicitly eligible under SS4A Implementation Grants when tied to documented pedestrian exposure, public input, and Safe Routes to School priorities. These treatments directly address vulnerable road users and can be paired with operational and physical countermeasures.

school speed & sign treatments

school zone speed & signing treatments \ MCS



CONSTRAINTS AND LIMITATIONS

Effectiveness depends on clear definition of school zone limits and operating times.

Flashing beacons require electrical power or solar maintenance.

Reduced speed limits apply only during designated school activity periods unless otherwise posted.

School zone signage alone does not physically calm traffic and may need complementary measures where speeds remain high.

TYPICAL APPLICATIONS

Public and private K–12 school frontages.

Streets with school loading zones, bus zones, or frequent student crossings.

Routes identified through Safe Routes to School planning or public input.

Locations where school-related pedestrian activity occurs adjacent to state or local roadways.

DESIGN CONSIDERATIONS

Regulatory speed limits:

School zone speed limits must comply with Nebraska Revised Statutes and MUTCD requirements.

Reduced speeds are typically posted with R2-1 School Speed Limit signs with flashing beacons or time-of-day plaques.[2]

Flashing beacons: Used to indicate when reduced school speed limits are in effect.

Flashing yellow beacons are standard; red beacons are not used for speed control.

Sign placement and spacing: Advance school warning signs (S1-1) placed prior to the school zone.

Regulatory speed signs placed at the start of the reduced speed zone.

Pavement markings: "SCHOOL," "SLOW," or school symbol markings may be used to reinforce driver awareness.

Bus and loading zones: Clearly marked curb zones reduce conflicts between pedestrians and vehicles.

Crossing coordination: School zone signing should align with crosswalk locations, curb ramps, and crossing guard operations.

NDOT coordination (state highway context): School zones located along US or state highways require NDOT review and approval.

Treatments must meet NDOT standards for signage, beacon operation, and roadway classification.

PROBLEM ADDRESSED

Vehicle speeds near schools during arrival and dismissal periods increase the risk and severity of crashes involving children, who are more vulnerable due to their size, visibility, and unpredictable movements. In Bridgeport, school-related pedestrian activity often occurs on streets that also serve general traffic, making clear definition of school zones and reduced-speed periods essential even where severe crash history is limited.

TARGET USERS

School-aged children walking or bicycling

Parents, caregivers, and school buses

Drivers traveling through school areas during active periods

ELIGIBILITY

SS4A Eligibility: Eligible as an SS4A infrastructure safety countermeasure

Program Alignment: Supports Safe Routes to School and exposure-based safety prioritization

Jurisdiction: NDOT review required where school zones are located on state-maintained roadways

COST AND TIMEFRAME

Cost: Low to Medium

Signing and pavement markings are low cost

Flashing beacons increase cost but significantly improve compliance

Timeframe: Short-term implementation once approvals are secured

Maintenance: Periodic sign inspection and beacon power/operation checks

IMPLEMENTATION PARTNERS

City of Bridgeport (Public Works, Planning)

Bridgeport Public Schools

Morrill County Sheriff's Office (enforcement coordination)

Nebraska Department of Transportation (state highway coordination)

ONLINE REFERENCES

MUTCD – Part 7: Traffic Control for School Areas [1] https://mutcd.fhwa.dot.gov/htm/2009/part7/part7.htm

FHWA – Safe Routes to School Toolkit [2] https://safety.fhwa.dot.gov/ped_bike/safe_routes/

FHWA – Proven Safety Countermeasures: Speed Management [3] https://safety.fhwa.dot.gov/speedmgt/

Nebraska Revised Statutes – School Zone Speed Regulations [4]

NDOT Roadway Design Manual & Traffic Engineering Guidance [5]

SS4A & SAFE SYSTEM ALIGNMENT

School zone speed and signing treatments align with the Safe System Approach by lowering operating speeds at locations with predictable concentrations of vulnerable users. These measures reduce crash severity risk and improve driver expectancy without relying solely on enforcement or major capital reconstruction.

Why Park-Specific Treatments

Park areas concentrate vulnerable users—particularly children—outside traditional school hours, requiring speed and access treatments tailored to recreational land uses rather than general roadway classifications.

SS4A Eligibility Note

Park Area Speed & Safety Treatments are SS4A implementation-eligible countermeasures that address exposure risk, vehicle speed, and pedestrian safety through context-sensitive design, consistent with FHWA's Safe System Approach.

park safety

area-based speed management \ MCS concept



area-based speed management \ MCS

SS4A & SAFE SYSTEM ALIGNMENT

Park Area Speed & Safety Treatments align with the Safe System Approach by managing vehicle speeds and reducing exposure at locations with predictable concentrations of vulnerable users. Rather than relying solely on enforcement, these treatments modify the roadway context to encourage safer behavior and reduce the likelihood and severity of crashes involving children and families.

CM-14 Park Area Speed Management Treatments

Park Area Speed & Safety Treatments apply a coordinated set of speed management, pedestrian access, and visibility measures to reduce vehicle speeds and conflicts near parks and recreational facilities where children, families, and other vulnerable users are present.

PROBLEM ADDRESSED

Parks and recreational facilities generate concentrated pedestrian activity—often involving children and families—along streets that also serve through traffic, trucks, or higher operating speeds. In Bridgeport, several parks and recreation destinations are accessed via roadways not originally designed for frequent pedestrian crossings or slow-speed operation. These conditions increase the risk and severity of conflicts, particularly where sidewalks, crossings, or speed cues are limited.

SAFETY ISSUES ADDRESSED

Excessive vehicle speeds adjacent to parks and recreation facilities

Conflicts between vehicles, pedestrians, and park users crossing the roadway

Limited visibility and driver expectancy near park entrances

Exposure of children and families to higher-speed traffic environments

Truck traffic operating near recreational areas

BENEFITS

Reduces vehicle speeds in areas with high pedestrian and child activity.

Improves safety and comfort for park users accessing facilities on foot or by mobility aid.

Addresses conflicts between through

traffic, trucks, and recreational users.

Enhances visibility and predictability at park frontages and crossings.

Supports equitable access to community recreational facilities.

Reinforces Safe System principles by managing speed and exposure rather than relying on enforcement alone.

CONSTRAINTS AND LIMITATIONS

Effectiveness depends on consistent application across park frontage areas.

Some measures may require public outreach to address driver and neighborhood expectations.

Truck routing or discouragement strategies must maintain necessary local access.

Physical traffic calming elements may require additional design and funding phases.

NDOT coordination may be required where parks front state highways.

TYPICAL APPLICATIONS

Streets fronting or adjacent to parks, playgrounds, pools, and athletic facilities.

Corridors with documented speeding or truck traffic near park entrances.

Locations with incomplete sidewalks or ADA access near recreational destinations.

Areas where children frequently cross streets to reach park facilities.

Park zones identified through community comments and field observations as safety concern areas.

DESIGN CONSIDERATIONS

Speed management tools (context-sensitive): Speed feedback signs

Gateway or transition markings

Narrowed travel lanes or edge line clarification

Pedestrian safety enhancements: High-visibility crosswalks at park access points

Advance yield lines and state-law yield signage

ADA-compliant curb ramps and sidewalk infill

Truck and vehicle management: Signage discouraging through truck traffic where appropriate

Operational routing adjustments rather than full prohibitions

Flexibility: Treatments may vary by park based on frontage conditions, traffic volumes, and surrounding land use

Authority & coordination: City authority applies on local streets; NDOT coordination required on state highways

Phasing: Can be implemented incrementally using quick-build measures, followed by capital upgrades if warranted

TARGET LOCATIONS & USERS

Target Locations

Streets fronting parks, playgrounds, pools, athletic fields, and recreation facilities

Park entrances and informal pedestrian crossing locations

Corridors with documented speeding or truck activity near park access points

Locations identified through public comments or field observations

TARGET USERS

Children and families accessing parks and recreational facilities

Pedestrians and mobility device users

Drivers traveling through or adjacent to park areas

ELIGIBILITY

SS4A Eligibility: Eligible as an infrastructure safety countermeasure under SS4A Implementation Grants

Project Type: Speed management, pedestrian safety, and visibility improvements

Jurisdiction: NDOT coordination required where treatments are located on state-maintained roadways

COST AND TIMEFRAME

Cost: Low to Medium

Many treatments rely on signing, striping, and portable devices

Physical calming measures may increase cost if pursued in later phases

Timeframe: Short- to Mid-term

Quick-build measures can be implemented rapidly

Capital upgrades phased as funding becomes available

IMPLEMENTATION PARTNERS

City of Bridgeport (Public Works, Planning, Parks & Recreation)

Morrill County Sheriff's Office (coordination and targeted enforcement support)

Nebraska Department of Transportation (state highway coordination)

Community groups and park users (outreach and feedback)

ONLINE REFERENCES

FHWA – Speed Management Guide [1] https://highways.dot.gov/safety/speed-management

FHWA – Proven Safety Countermeasures [2] https://safety.fhwa.dot.gov/provencountermeasures/

FHWA – Safe Routes & Child Safety Near Schools and Parks [3] https://safety.fhwa.dot.gov/ped_bike/

MUTCD – Speed, Warning, and Regulatory Signage [4] https://mutcd.fhwa.dot.gov

NACTO – Designing Streets for Children [5] https://nacto.org

CM-15 Quick-Build Roadway Geometry & Lane Reconfiguration (State Highways)

Roadway geometry and operations improvements use pavement markings, signing, and visual channelization to clarify intended vehicle paths, reinforce driver expectancy, and reduce conflicts on high-speed or wide roadways. These treatments address safety issues caused by informal lane use, phantom lanes, unclear turning movements, and abrupt roadway transitions, particularly at intersections, gateways, and highway junctions.

All treatments are designed as painted or operational solutions that can be implemented without major reconstruction and are consistent with NDOT operational practices on urban state highways

PROBLEM ADDRESSED

Wide, high-speed highway corridors and complex junctions within Bridgeport—particularly along US-26 and US-385—create conditions where drivers form informal lanes, pass on shoulders, or misunderstand intended turning movements. These conditions increase conflict risk for all users, especially pedestrians and turning vehicles, even where crash history may be limited. Full reconstruction is often not feasible in the near term, making operational and striping-based solutions critical.

SAFETY ISSUES ADDRESSED

Informal or “phantom” lane use on wide pavement sections

Unclear turning movements and queue-jumping at intersections

Speed carryover from rural highway segments into town

Reduced pedestrian visibility and driver expectancy at crossings

Conflict between trucks, agricultural equipment, and local traffic

BENEFITS

Reduces unpredictable vehicle movements caused by informal or assumed lanes

Improves driver expectancy through clear lane definition and channelization

Lowers operating speeds through visual narrowing and transition cues

Reduces conflicts between through vehicles, turning vehicles, pedestrians, and bicyclists

Improves pedestrian visibility and crossing safety at intersections and gateways

Provides quick-build, adjustable treatments that can be refined based on observed behavior

CONSTRAINTS AND LIMITATIONS

Effectiveness depends on clear, well-maintained pavement markings

Painted treatments do not physically prevent improper movements

Snow removal and wear may require periodic restriping

Must accommodate truck and agricultural vehicle turning paths

NDOT coordination and approval required for all treatments on US highways

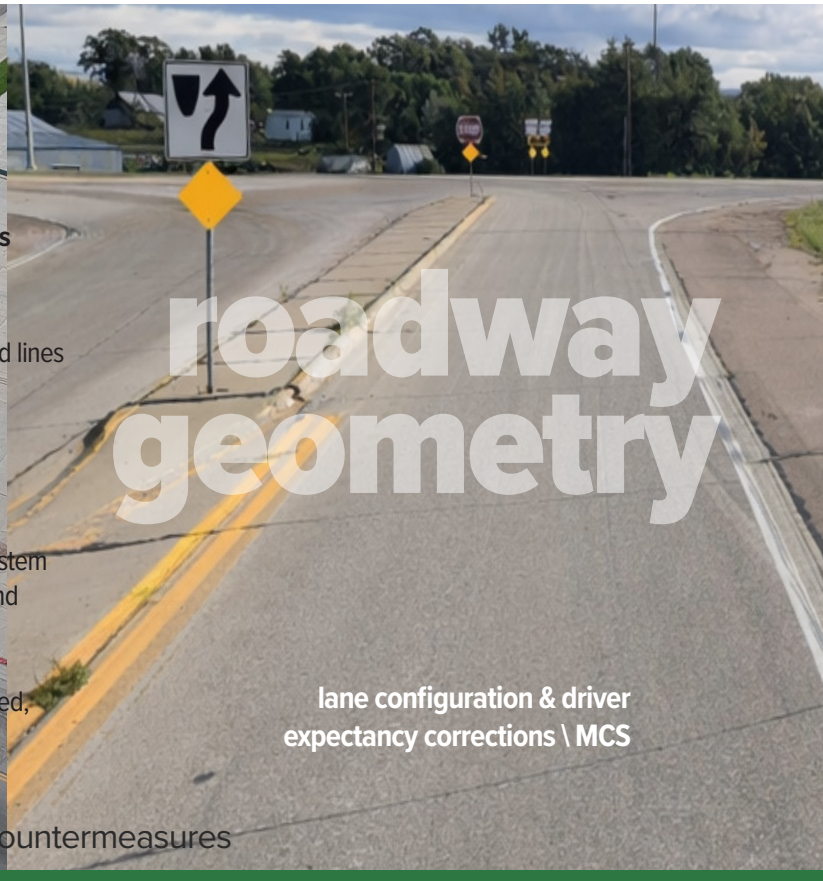


Integration With Other Countermeasures

Most effective when paired with:
Parking setbacks and daylighting
High-visibility crosswalks and advance yield lines
Speed feedback signs
Targeted, data-supported enforcement

SS4A Eligibility Note

This countermeasure supports the Safe System Approach by improving roadway design and operations to reduce crash severity, clarify expectations, and minimize human error consequences—particularly on higher-speed, state-controlled roadways.



lane configuration & driver expectancy corrections \ MCS

roadway geometry & operations

TYPICAL APPLICATIONS

Wide highway segments where drivers treat shoulders or excess pavement as travel lanes

Intersections with informal right-turn passing or queue-jumping behavior

Highway junctions near railroads, industrial access points, or agricultural facilities

Transition zones from rural highway to downtown or pedestrian-oriented areas

NDOT-controlled intersections where reconstruction is not currently feasible

COMMON TREATMENTS

This countermeasure may include one or more of the following, depending on location:

Lane Configuration & Expectancy Corrections

Lane narrowing (typically 10–11 ft lanes, where context allows)

Clear edge line striping to eliminate perceived extra pavement

Reinforcement of centerlines and TWLTLs

Painted Channelization & Phantom Lane Elimination

Painted right-turn tapers or channelization (no raised islands)

Gore markings, diagonal hatching, or painted buffers

Lane-use arrows and turn guidance markings

Roadway Transition & Gateway Markings

Visual narrowing at corridor entry points

Transverse bars, patterned markings, or enhanced centerlines

Consistent gateway treatments across similar approaches

Intersection Visibility & Operations

Refresh stop bars and lane lines

Targeted daylighting and corner no-parking zones

Enhanced STOP signage or STOP AHEAD signing where warranted

Parking stall re-striping to maintain effective lane width

Intersection Lighting (Where Appropriate)

Lighting upgrades to improve nighttime visibility where implemented as part of a coordinated pedestrian or intersection safety project.

DESIGN CONSIDERATIONS

Lane widths: 10–11 ft typical target where appropriate for context

Striping: Solid edge lines to eliminate ambiguous space

Channelization: Painted only; no raised features unless separately approved

Pedestrian safety: Avoid increasing crossing distance or exposure

Coordination: All treatments on US-26 / US-385 require NDOT review

Evaluation: Observe post-installation behavior and adjust markings as needed

TARGET LOCATIONS & USERS

Target Locations: NDOT-controlled corridors within Bridgeport (US-26, US-385)

Highway intersections and junctions near rail crossings or industrial access

Gateway transitions from rural highway to downtown context

Locations where reconstruction is not currently feasible

TARGET USERS

Through drivers and local motorists

Truck and agricultural vehicle operators

Pedestrians crossing or traveling near highways

Bicyclists using adjacent shoulders or crossings

ELIGIBILITY

SS4A Eligibility: Eligible as an infrastructure safety countermeasure under SS4A Implementation Grants

Project Type: Quick-build roadway operations and geometric clarification

Jurisdiction: NDOT review and approval required for all treatments on US highways

COST AND TIMEFRAME

Cost: Low

Primarily pavement markings, signing, and operational adjustments

Timeframe: Short-term

Can be implemented quickly following NDOT coordination

Maintenance: Periodic restriping and inspection due to wear and winter operations

IMPLEMENTATION PARTNERS

City of Bridgeport (Planning, Public Works)

Nebraska Department of Transportation (traffic engineering and approvals)

Morrill County Sheriff's Office (monitoring and enforcement coordination)

ONLINE REFERENCES

FHWA – Safe System Approach https://www.fhwa.dot.gov/safety/safesystem/

FHWA – Proven Safety Countermeasures https://safety.fhwa.dot.gov/provencountermeasures/

FHWA – Intersection & Roadway Departure Safety https://safety.fhwa.dot.gov/intersection/

MUTCD – Part 3 Pavement Markings https://mutcd.fhwa.dot.gov

AASHTO – Green Book https://www.transportation.org

SS4A & SAFE SYSTEM ALIGNMENT

Roadway Geometry & Operations treatments align with the Safe System Approach by improving roadway clarity, reducing speed through visual cues, and minimizing the consequences of human error. These measures focus on preventing severe outcomes rather than relying on driver perfection, particularly on higher-speed, state-controlled facilities.

CM-16 School Bus Loading Zone Delineation & Curb Management

School bus loading zone delineation uses curb markings, signage, and pavement markings to clearly define where school buses load and unload students along the street. This countermeasure improves safety and operations during peak arrival and dismissal periods by reducing conflicts between buses, parent vehicles, and pedestrians.

This treatment is intended for locations where buses must load within the roadway and where improved curb management can reduce confusion and unsafe passing behavior.

PROBLEM ADDRESSED

During school arrival and dismissal periods, buses, parent vehicles, and pedestrians often compete for limited curb space. When bus loading locations are not clearly defined, buses may stop in travel lanes, drivers may illegally pass or double-park, and students may be forced to board or exit in unsafe conditions. These conflicts increase exposure risk for children even in locations without a history of severe crashes.

SAFETY ISSUES ADDRESSED

Student exposure to moving traffic during boarding and unloading

Illegal passing or queue-jumping near stopped school buses

Conflicts between buses, parent vehicles, and pedestrians

ADA access challenges for students requiring lifts or ramps

Congestion and unpredictable vehicle movements near schools

BENEFITS

Improves Child Safety: Provides a predictable, clearly marked space for students boarding and exiting buses, reducing exposure to moving traffic.

Reduces Traffic Conflicts: Discourages illegal passing, double-parking, and sudden stopping near active bus loading areas.

Supports ADA Access: Enables proper placement of lifts, ramps, and level boarding areas for students with disabilities.

Improves Traffic Operations: Reduces congestion and uncertainty during peak pickup and drop-off times.

Low-Cost, High Impact: Typically implemented through striping, signage, curb markings, and curb-use regulations.

Enhances Compliance: Clear, consistent markings reduce driver confusion and misuse of loading zones.

TYPICAL APPLICATIONS

Schools & Head Start Facilities: Primary use for student pickup and drop-off.



SS4A Relevance

Implementation-Eligible

Exposure-based (children, vulnerable users)

Low-cost, scalable

Strong alignment with school safety priorities

curbside loading | pickup - drop off pull-out areas

School Routes on Local Streets: Locations where buses currently stop in travel lanes.

Special Education & Para-Transit Loading: Areas requiring ramp deployment and longer dwell times.

Community Facilities: Recreation centers, senior facilities, and childcare centers with predictable loading demand.

Constrained Downtown Streets: Where pull-outs or off-street loading are not feasible.

DESIGN CONSIDERATIONS

Zone Length: Typical bus loading zones range 40–60 feet, depending on bus type and turning movements.

Longer zones may be required where multiple vehicles queue.

Curb Treatment: Painted curb (yellow or school-zone designation)

Pavement markings ("BUS LOADING ONLY")

Regulatory signage with time-of-day restrictions

ADA Requirements: Provide a stable, level landing area adjacent to the curb for lift or ramp deployment.

Ensure connection to the sidewalk network.

Location: Prefer mid-block or downstream of intersections to avoid blocking sight lines.

Avoid placing zones immediately adjacent to crosswalks unless specifically designed.

Visibility: Ensure zones are visible to approaching drivers.

Coordinate with parking setbacks, signing, and striping.

Operations: Consider school schedules and staggered arrival times.

Clearly define enforcement responsibility.

POLICY & REGULATORY ALIGNMENT

FHWA: Supports curb management and loading zone delineation as a safety and operational strategy near schools.

MUTCD: Allows regulatory and curb markings to designate loading zones and restrict parking.

Nebraska State Law: Permits local jurisdictions to regulate curb use and designate bus loading areas.

Municipal Code Authority: Cities have clear authority to regulate stopping, standing, and parking in the public right-of-way.

NDOT Coordination: Required only when zones are located on state highways; typically compatible with urban main street contexts.

TARGET LOCATIONS & USERS

Target Locations: Streets adjacent to K–12 schools and early childhood facilities

School routes where buses currently load in travel lanes

Constrained downtown or neighborhood streets without space for pull-outs

Locations identified through school staff input or field observation

Target Users: School-aged children and early childhood students

Students with disabilities requiring accessible boarding

School bus drivers and para-transit operators

Drivers traveling through school areas

ELIGIBILITY

SS4A Eligibility: Eligible as an infrastructure safety countermeasure under SS4A Implementation Grants

Project Type: Curb management and operational safety improvement

Jurisdiction: City authority on local streets; NDOT coordination required only if located on state highways

COST AND TIMEFRAME

Cost: Low

Primarily striping, curb paint, and signage

Timeframe: Short-term

Can be implemented quickly once locations are identified and approved

Maintenance: Periodic repainting and sign upkeep

IMPLEMENTATION PARTNERS

City of Bridgeport (Public Works, Planning)

Bridgeport Public Schools and school administrators

School transportation providers

Morrill County Sheriff's Office (enforcement coordination)

NDOT (if located on state-maintained roadways)

[1] *FHWA – Safe Routes to School: Bus Loading and Unloading Safety*

https://safety.fhwa.dot.gov/ped_bike/safe_routes/

[2] *MUTCD – School Area Traffic Control & Parking Regulations (Part 7; Part 2B)*

https://mutcd.fhwa.dot.gov

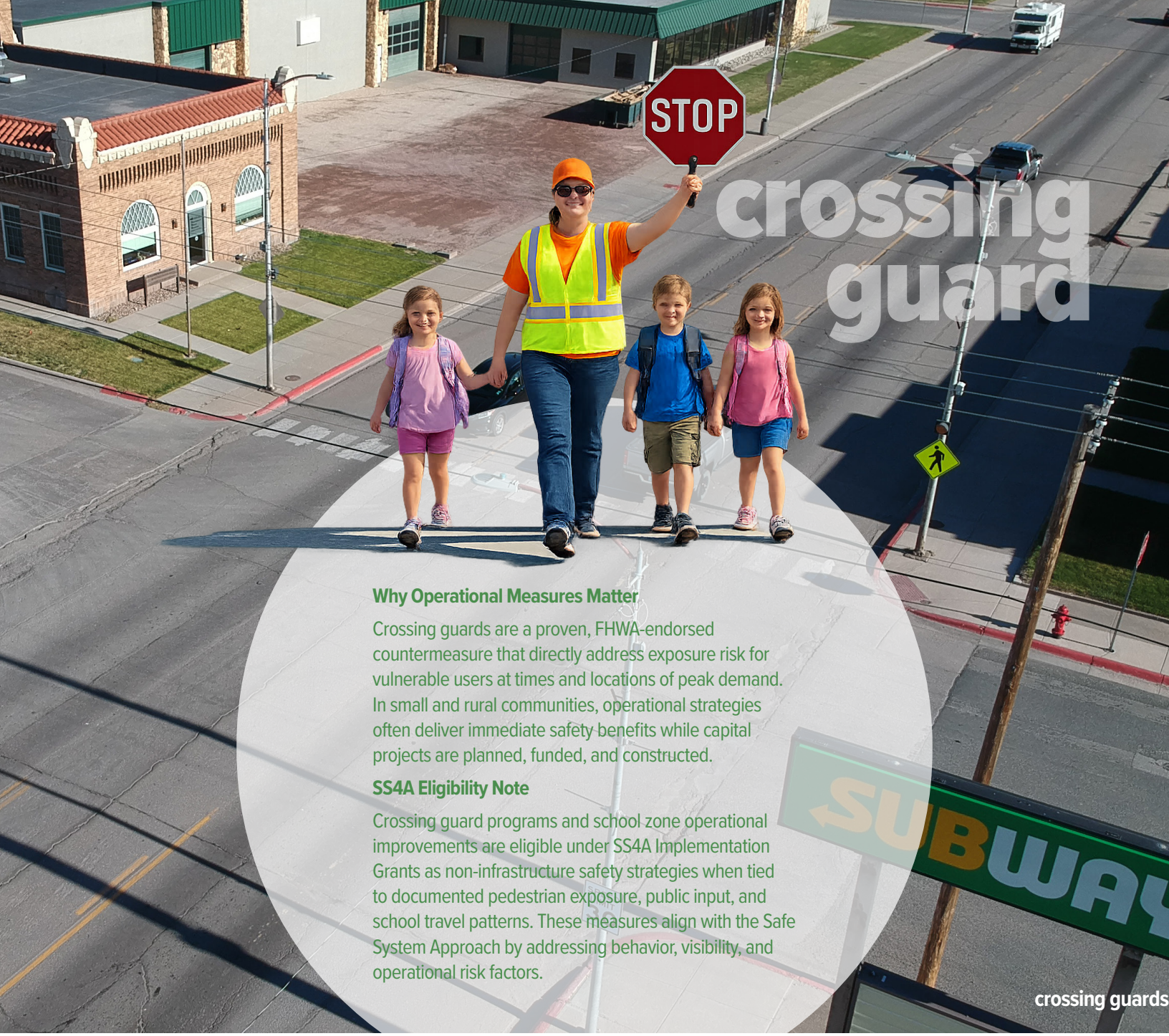
[3] *FHWA – Curb Management and Safety Near Schools*

https://safety.fhwa.dot.gov/ped_bike/

[4] *Nebraska Revised Statutes – Authority to Regulate Stopping, Standing, and Parking (applicable state statutes governing curb use and school bus operations)*

SS4A & SAFE SYSTEM ALIGNMENT

School Bus Loading Zone Delineation supports the Safe System Approach by reducing exposure at predictable conflict points and ensuring that inevitable human error does not result in severe outcomes. By organizing curb space and clarifying expectations for all users, this countermeasure prioritizes child safety without relying solely on enforcement.



Why Operational Measures Matter

Crossing guards are a proven, FHWA-endorsed countermeasure that directly address exposure risk for vulnerable users at times and locations of peak demand. In small and rural communities, operational strategies often deliver immediate safety benefits while capital projects are planned, funded, and constructed.

SS4A Eligibility Note

Crossing guard programs and school zone operational improvements are eligible under SS4A Implementation Grants as non-infrastructure safety strategies when tied to documented pedestrian exposure, public input, and school travel patterns. These measures align with the Safe System Approach by addressing behavior, visibility, and operational risk factors.

crossing guards

CM-17 School Crossing Guard Program

A coordinated operational program that deploys trained crossing guards, manages school arrival and dismissal operations, and reinforces school zone traffic controls to improve driver yielding and pedestrian safety during peak school travel periods.

PROBLEM ADDRESSED

During school arrival and dismissal periods, children must cross streets at times of peak traffic activity, often in environments with limited gaps, distracted drivers, or constrained visibility. In Bridgeport, these conditions create elevated exposure risk for child pedestrians even where crash history is limited. Crossing guards address this risk by actively managing conflicts during the most critical time windows.

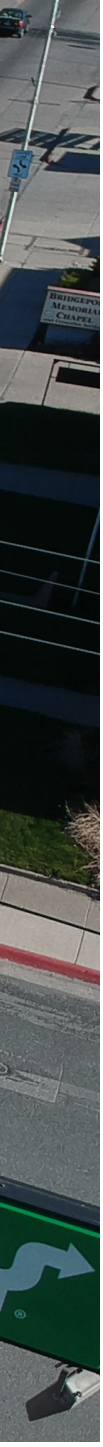
SAFETY ISSUES ADDRESSED

Limited driver yielding to child pedestrians at school crossings

Insufficient gaps in traffic during peak school travel times

Conflicts between vehicles, buses, and pedestrians near schools

Exposure risk concentrated in short, predictable time periods



BENEFITS

Provides direct supervision and gap creation for child pedestrians at high-risk crossings.[1]

Significantly improves driver compliance with pedestrian right-of-way laws at school crossings.[2]

Reduces conflicts during peak congestion periods associated with school arrival and dismissal.

Highly cost-effective compared to capital treatments and can be implemented quickly.

Complements physical countermeasures such as crosswalks, signage, and speed management.

Strongly aligned with Safe System and SS4A exposure-based safety strategies.

CONSTRAINTS AND LIMITATIONS

Operates only during designated time windows (before/after school).

Requires recruitment, training, and ongoing program management.

Effectiveness depends on consistent staffing and visibility.

Does not physically slow traffic outside active guard periods.

Weather conditions can affect operations and staffing reliability.

TYPICAL APPLICATIONS

School crossings with documented yielding failures or near-misses.

Routes with high volumes of child pedestrians or school bus activity.

Locations where physical improvements are planned but not yet implemented.

State or local roadways where capital changes require longer coordination timelines.

DESIGN CONSIDERATIONS

Guard placement: Focus on crossings with high exposure risk rather than crash history alone.

Coordinate placement with crosswalk markings and curb ramps.

Training standards: Guards should be trained consistent with FHWA and NHTSA crossing guard guidance, including safe crossing procedures and visibility requirements.

Visibility and equipment: High-visibility apparel, stop paddles meeting MUTCD requirements, and optional portable signage.

Operational coordination: Align guard schedules with school bell times, bus schedules, and special events.

Enforcement support: Periodic law enforcement presence can reinforce compliance during early implementation.

State highway context: Where crossings occur on US or state highways, coordination with NDOT is required to confirm crossing locations and operational protocols.

TARGET LOCATIONS & USERS

Target Locations: School crossings with high child pedestrian volumes

Routes with documented yielding failures or near-miss reports

Crossings adjacent to bus loading zones or school entrances

Locations where physical upgrades are planned but not yet implemented

Target Users: School-aged children walking or bicycling

School bus riders accessing stops

Drivers traveling through school zones during peak periods

ELIGIBILITY

SS4A Eligibility: Eligible as a non-infrastructure (operational) safety countermeasure under SS4A Implementation Grants

Program Type: School safety operations and behavior-based risk reduction

Jurisdiction: City-managed program; NDOT coordination required where crossings are located on state highways

COST AND TIMEFRAME

Cost: Low (programmatic)

Primarily staffing, training, equipment, and coordination

Timeframe: Immediate to Short-term

Can be implemented or expanded quickly once staffing is secured

Ongoing Needs: Recruitment, training refreshers, and scheduling coordination

IMPLEMENTATION PARTNERS

City of Bridgeport (Planning, Public Works)

Bridgeport Public Schools

School transportation providers

Morrill County Sheriff's Office (periodic enforcement support)

Nebraska Department of Transportation (if crossings occur on state highways)

ONLINE REFERENCES

FHWA – Pedestrian Safety Guide and Countermeasure Selection System [1] https://safety.fhwa.dot.gov/ped_bike/tools_solve/

NHTSA – Adult School Crossing Guard Guidelines [2] https://www.nhtsa.gov/road-safety/school-crossing-guards

MUTCD – Part 7: Traffic Control for School Areas [3] https://mutcd.fhwa.dot.gov/htm/2009/part7/part7.htm

FHWA – Safe Routes to School Programs [4] https://safety.fhwa.dot.gov/ped_bike/safe_routes/

SS4A & SAFE SYSTEM ALIGNMENT

Crossing guards support the Safe System Approach by managing conflicts at times of highest exposure and ensuring that inevitable human error does not result in severe outcomes. By creating safe gaps and reinforcing driver expectations, this countermeasure prioritizes child safety without requiring permanent infrastructure changes.



bus loading zone delineation \ MCS concept

SS4A Relevance

Implementation-Eligible. Exposure-based (children, vulnerable users). Low-cost, scalable. Strong alignment with school safety priorities.

POLICY & REGULATORY ALIGNMENT

FHWA: Supports geometric separation of vulnerable users from traffic as a Safe System strategy.

AASHTO: Provides guidance for bus pullouts and boarding areas in the Green Book.

ADA: Requires accessible boarding and pedestrian connections.

Nebraska State Law & NDOT: Coordination required when located along state highways or within NDOT right-of-way.

CM-18 Dedicated Bus Pullouts (Early Childhood Facilities)

Dedicated bus pullouts provide a physically separated, off-street location for buses to load and unload passengers outside the active travel lane. This countermeasure significantly improves safety for very young children by eliminating exposure to moving traffic and providing a controlled boarding environment.

This treatment is intended for early childhood facilities where traffic speeds, roadway context, and user vulnerability exceed what curbside loading can safely accommodate.

PROBLEM ADDRESSED

Early childhood facilities serve very young children who are especially vulnerable during boarding and unloading. When buses must stop within the travel lane on higher-speed or higher-volume roadways, children, caregivers, and drivers are exposed to elevated crash risk. In these contexts, curbside loading alone may not provide an adequate level of protection, particularly where longer dwell times, ADA boarding, or complex supervision needs are present.

Safety Issues Addressed

Exposure of very young children to moving traffic during boarding and unloading

Rear-end and sideswipe crash risk associated with stopped buses in travel lanes

Limited space for ADA ramp or lift deployment

Conflicts between buses, caregivers, and through traffic

Driver unpredictability around stopped school buses **BENEFITS**

Maximizes Child Safety: Removes boarding and alighting activity from the travel lane, reducing exposure to moving vehicles.

Reduces Crash Risk: Lowers the likelihood of rear-end and sideswipe crashes associated with stopped buses in traffic.

Supports ADA Access: Allows for safer, more efficient deployment of lifts, ramps, and mobility devices.

Improves Supervision: Provides space for caregivers and staff to assist children safely during boarding.

Improves Traffic Flow: Eliminates traffic delays and passing conflicts caused by stopped buses.



Higher-Order Safety Control: Applies physical separation rather than relying on driver compliance alone.

CONSTRAINTS AND LIMITATIONS

Higher Cost: Requires design, construction, and potential utility or drainage modifications.

SPACE REQUIREMENTS: Requires sufficient right-of-way or adjacent property area.

Longer Implementation: Involves planning, permitting, and construction timelines.

Coordination Needed: May require coordination with NDOT, property owners, or partner agencies.

TYPICAL APPLICATIONS

Schools & Head Start Facilities: Primary use for student pickup and drop-off.

School Routes on Local Streets: Locations where buses currently stop in travel lanes.

Special Education & Para-Transit Loading: Areas requiring ramp deployment and longer dwell times. Locations serving very young children or students with special needs.

Community Facilities: Recreation centers, senior facilities, and childcare centers with predictable loading demand.

Roadway Facilities: With higher speeds or traffic volumes. Sites where curbside loading presents elevated safety risk.

DESIGN CONSIDERATIONS

Pullout Geometry: Accommodate full bus length and turning radii

Avoid backing or complex maneuvers

ADA Requirements: Provide level boarding surfaces and accessible pedestrian connections

Ensure compliance with ADA slope and clearance standards

Pedestrian Paths: Clearly define paths from pullout to building entrance

Separate pedestrian movements from vehicle circulation

Drainage & Utilities: Ensure proper drainage and avoid standing water

Signing & Striping: Clearly designate bus-only use and restrict general parking Policy & Regulatory Alignment

TARGET LOCATIONS & USERS

Target Locations: Head Start and early childhood education facilities

Sites with higher operating speeds or traffic volumes

Locations where curbside loading presents elevated safety risk

Facilities with frequent bus activity and longer boarding dwell times

Sites identified through school staff input and field observation

Target Users: Early childhood students and preschool-aged children

Children with disabilities requiring accessible boarding

Caregivers, teachers, and support staff

School bus and para-transit operators

ELIGIBILITY

SS4A Eligibility: Eligible as an infrastructure safety countermeasure under SS4A Implementation Grants

Project Type: Geometric and operational exposure-reduction treatment

Jurisdiction: City authority on local streets; NDOT review and approval required where pullouts are located on state highways or within NDOT right-of-way

COST AND TIMEFRAME

Cost: Medium

Higher than striping-based treatments due to construction and site work

Timeframe: Mid-term

Requires planning, design, permitting, and construction

Maintenance: Periodic inspection of pavement, drainage, and signage

IMPLEMENTATION PARTNERS

City of Bridgeport (Planning, Public Works)

Early childhood facility operators (e.g., Head Start)

School transportation providers

Nebraska Department of Transportation (if within state ROW)

Adjacent property owners or partner agencies, where applicable

ONLINE REFERENCES

FHWA – Safe System Approach Supports separation of vulnerable users from moving traffic. https://www.fhwa.dot.gov/safety/safesystem/

FHWA – School Transportation Safety Provides guidance on school-related roadway safety, loading areas, and student protection. https://safety.fhwa.dot.gov/roadusers/school_bus/

AASHTO – A Policy on Geometric Design of Highways and Streets (Green Book) Provides guidance on bus pullouts, curbside stops, and off-street boarding areas. https://www.transportation.org/technical-training-solutions/aashto-publications/

U.S. Department of Justice – ADA Standards for Accessible Design Establishes requirements for accessible boarding areas, ramps, and pedestrian connections.

SS4A & SAFE SYSTEM ALIGNMENT

Dedicated bus pullouts align with the Safe System Approach by applying a higher-order safety control—physical separation—to protect the most vulnerable users. By removing boarding activity from the travel lane entirely, this countermeasure reduces exposure and minimizes the consequences of human error by drivers or caregivers.

route management



truck farm equip rte mgmt\ MCS concept

CM-19 Truck & Farm Equipment Route Management

Establishes designated routes, signing, and operational guidance to manage truck and wide farm equipment movements in order to reduce conflicts with pedestrians, schools, parks, and downtown activity while maintaining essential freight and agricultural access.

PROBLEM ADDRESSED

In Bridgeport, trucks and wide farm equipment are essential to the local economy but often share streets with pedestrians, school traffic, parks, and downtown activity. When heavy vehicles use streets not designed for their size, speed, or turning needs, conflicts increase and safety risks rise—particularly for vulnerable users. Clear route management is needed to reduce exposure while preserving necessary freight and agricultural access.

SAFETY ISSUES ADDRESSED

Conflicts between heavy vehicles and pedestrians, bicyclists, and children

Limited visibility and longer stopping distances for trucks in pedestrian-oriented areas

Turning conflicts and encroachment by wide farm equipment

Cut-through truck traffic on residential or downtown streets

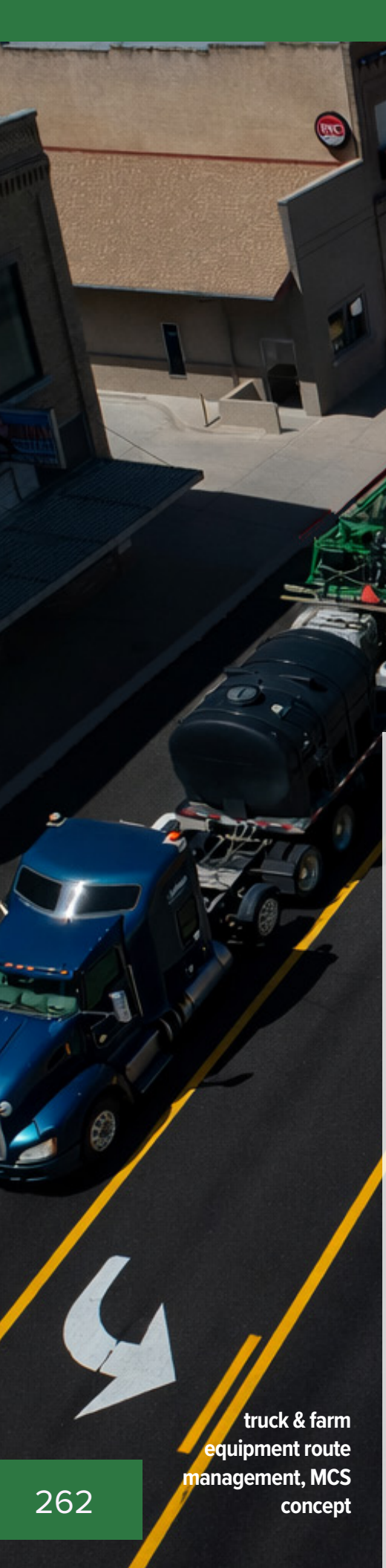
Driver confusion about appropriate routes for large vehicles **BENEFITS**

Improved Safety: Reduces conflicts between heavy vehicles and vulnerable users, particularly in downtown, residential, school, and park areas.

Predictable Operations: Clarifies where trucks and farm equipment are expected to travel, reducing surprise movements and driver confusion.

Downtown Livability: Helps preserve pedestrian comfort and access in commercial and civic areas.

Low-Cost Implementation: Often relies on signage, routing guidance, and policy rather than major construction.



truck & farm equipment route management, MCS concept

freight | heavy vehicle management

Supports Local Economy: Maintains efficient access for agriculture, industry, and freight while balancing community safety.

FHWA Safe System Alignment: Addresses exposure and conflict risk through systemic network management rather than relying on driver behavior alone.

CONSTRAINTS AND LIMITATIONS

Enforcement Support: Effectiveness depends on clear routing, education, and supportive enforcement rather than punitive or blanket enforcement.

Limited Route Options: In small or rural communities, alternate routes may be constrained.

Seasonal Variability: Farm equipment movements peak during planting and harvest seasons.

Jurisdictional Coordination: Routes on state highways require NDOT coordination and approval.

Community Acceptance: Requires careful messaging to avoid perceptions of restricting agricultural operations.

TYPICAL APPLICATIONS

Downtown corridors with high pedestrian activity.

Streets adjacent to schools, parks, and community facilities.

Residential streets experiencing cut-through truck traffic.

Routes near rail crossings, industrial facilities, or grain elevators.

Transitional corridors between highways and local street networks.

Corridors affected by rail crossings, industrial access, or freight detours during blockages

DESIGN CONSIDERATIONS

Route Designation: Identify preferred truck and farm equipment routes using existing arterial or collector streets where feasible.

Signing & Wayfinding: Install clear truck route, restriction, and wayfinding signage consistent with MUTCD standards.

Time-of-Day Management: Consider time-based restrictions or guidance near schools or peak pedestrian periods.

Street Geometry Awareness: Account for turning radii, lane widths, and sight distance needed for wide or slow-moving equipment.

Policy Framework: Adopt resolutions or ordinances that formalize routing expectations while allowing necessary local access.

NDOT Coordination: Engage NDOT early where routes involve US-385, US-26, or other state facilities.

Education & Outreach: Work with agricultural operators, trucking firms, and local businesses to ensure understanding and buy-in.

Integration with Other Measures: Coordinate with parking setbacks, lane clarity improvements, and speed management near sensitive land uses.

TARGET LOCATIONS & USERS

Target Locations: Downtown corridors with pedestrian activity

Streets adjacent to schools, parks, and civic facilities

Residential streets experiencing truck cut-through traffic

Transitions between state highways and the local street network

Corridors near grain elevators, rail crossings, or industrial access points

Target Users: Truck drivers and agricultural equipment operators

Pedestrians, bicyclists, and school-aged children

Local motorists navigating shared-use streets

ELIGIBILITY

SS4A Eligibility: Eligible as an infrastructure and policy-based safety countermeasure under SS4A Implementation Grants

Project Type: Network management, routing, and operational safety

Jurisdiction: City authority on local streets; NDOT coordination required for routes involving state highways

COST AND TIMEFRAME

Cost: Low

Primarily signage, policy development, and outreach

Timeframe: Short-term

Can be implemented following route identification and coordination

Maintenance: Periodic sign upkeep and policy review

IMPLEMENTATION PARTNERS

City of Bridgeport (Planning, Public Works)

Nebraska Department of Transportation (state route coordination)

Local agricultural operators and freight carriers

Morrill County Sheriff's Office (enforcement coordination)

Local businesses and industrial facilities

ONLINE REFERENCES

FHWA – Freight Management and Land Use Handbook [1] https://ops.fhwa.dot.gov/publications/fhwahop12005/

FHWA – Safe System Approach [2] https://www.transportation.gov/road-safety/safe-system

MUTCD – Regulatory and Guide Signs for Truck Routes [3]

AASHTO – Guide for Geometric Design of Freight Facilities [4]

SS4A & SAFE SYSTEM ALIGNMENT

Truck & Farm Equipment Route Management aligns with the Safe System Approach by reducing exposure and separating high-risk conflicts through network-level decisions. Rather than relying on individual driver behavior, this countermeasure manages where heavy vehicles operate to minimize the severity and likelihood of crashes involving vulnerable users.

CM-20 Truck Access Management Near Sensitive Land Uses

Truck discouragement near sensitive land uses applies targeted, location-specific strategies to reduce through truck and heavy vehicle traffic in areas where large vehicles are incompatible with surrounding activity—such as schools, parks, downtowns, and residential streets—while preserving necessary local access and system-wide freight mobility.

This countermeasure is applied selectively and conditionally, and is most effective when paired with designated truck and farm equipment routes established through CM-19.

Applies targeted, location-specific measures—such as signing, time-of-day restrictions, and local-access controls—to discourage through truck traffic near schools, parks, downtown areas, and residential streets where heavy vehicles are incompatible with surrounding land uses and alternate routes are available.

PROBLEM ADDRESSED

Heavy vehicles traveling through areas with high pedestrian activity increase conflict risk due to size, stopping distance, and limited maneuverability. In Bridgeport, certain streets—particularly near schools, parks, downtown areas, and residential neighborhoods—are not designed to safely accommodate through truck or wide farm equipment traffic. Targeted discouragement reduces exposure in these locations without restricting necessary freight or agricultural access.

SAFETY ISSUES ADDRESSED

Conflicts between heavy vehicles and pedestrians or bicyclists

Limited visibility and longer stopping distances near sensitive land uses

Noise and intimidation effects that discourage walking and community use

Cut-through truck traffic on streets not designed for heavy vehicles BENEFITS

Reduces Exposure for Vulnerable



truck discouragement near sensitive land use, MCS concept

Users: Lowers the presence of heavy vehicles near children, pedestrians, and bicyclists.

Improves Livability: Enhances comfort, noise conditions, and safety perception in downtown, residential, and school-adjacent areas.

Clarifies Expectations: Provides clear guidance to truck operators about where through movements are discouraged.

Supports Economic Activity: Maintains freight and agricultural access by discouraging only unnecessary through traffic.

Low-Cost Implementation: Often implemented through signage, policy, and operational controls rather than construction.

Safe System Consistent: Reduces conflict severity by managing where high-mass vehicles operate.

CONSTRAINTS AND LIMITATIONS

Requires Viable Alternate Routes: Discouragement is appropriate only where preferred routes exist.

Enforcement & Compliance: Effectiveness depends on clear signing and periodic enforcement.

Seasonal Agricultural Needs: Farm equipment movements may require flexibility during planting and harvest.

Jurisdictional Coordination: Measures on state highways or state-designated freight routes require NDOT coordination.

Community Messaging: Requires careful communication to avoid perceptions of restricting essential services.

TYPICAL APPLICATIONS

Streets adjacent to schools, parks, and playgrounds

Downtown and Main Street corridors with high pedestrian activity

Residential streets experiencing truck cut-through traffic

Areas where alternate truck routes are available

Locations identified through public input, field observation, or task force guidance

DESIGN & OPERATIONAL CONSIDERATIONS

Discouragement Tools (Context-Sensitive): "No Through Truck" or "Local Access Only" signing

Time-of-day restrictions near schools or peak pedestrian periods

Turn restrictions that maintain local access

Signing & Consistency: MUTCD-compliant regulatory and guide signage

Clear advance notice to prevent sudden maneuvers

Policy Framework: Adopt resolutions or ordinances that define discouragement intent and exceptions

Agricultural Flexibility: Explicit allowances for local farm access and seasonal operations

Coordination with CM-19: Ensure discouraged areas are supported by clearly designated routes

Evaluation: Monitor compliance and adjust measures based on observed behavior

TARGET LOCATIONS & USERS

Target Locations: School and park frontages

Downtown and Main Street corridors

Residential streets with pedestrian activity

Locations with identified alternate truck routes

Target Users: Pedestrians and bicyclists, especially children

Local residents and downtown patrons

Truck and agricultural equipment operators

ELIGIBILITY

SS4A Eligibility: Eligible as an infrastructure, policy, and operational safety countermeasure under SS4A Implementation Grants

Project Type: Network and land-use-compatible freight management

Jurisdiction: City authority on local streets; NDOT coordination required on state routes

COST AND TIMEFRAME

Cost: Low

Primarily signage, policy development, and outreach

Timeframe: Short-term

Can be implemented following coordination and route confirmation

Maintenance: Periodic sign inspection and policy updates

IMPLEMENTATION PARTNERS

City of Bridgeport (Planning, Public Works)

Nebraska Department of Transportation (state route coordination)

Local agricultural operators and freight carriers

Morrill County Sheriff's Office (targeted enforcement support)

Downtown and neighborhood stakeholders

ONLINE REFERENCES

FHWA – Freight Management and Land Use Handbook https://ops.fhwa.dot.gov/publications/fhwahop12005/

FHWA – Safe System Approach https://www.transportation.gov/road-safety/safe-system

MUTCD – Regulatory and Guide Signs for Truck Routes https://mutcd.fhwa.dot.gov

AASHTO – Freight and Highway Design Guidance https://www.transportation.org

SS4A & SAFE SYSTEM ALIGNMENT

Truck discouragement near sensitive land uses supports the Safe System Approach by managing exposure to high-mass vehicles in environments with vulnerable users. By discouraging through movements rather than relying on driver behavior alone, this countermeasure reduces the likelihood and severity of crashes while maintaining essential access.



snow | ice removal prioritization

snow & ice removal prioritization, MCS concept

CM-21 Snow & Ice Removal Prioritization (Pedestrian Routes)

Snow and ice removal prioritization establishes a clear, safety-focused framework for plowing, de-icing, and winter maintenance that prioritizes pedestrian routes, school access, crossings, and high-risk locations rather than relying solely on roadway classification.

This countermeasure reduces winter exposure risk for pedestrians and drivers by ensuring that critical walking routes and crossings remain usable during snow and ice events—especially for children, older adults, and people with disabilities.

PROBLEM ADDRESSED

Winter weather conditions increase pedestrian exposure, reduce accessibility, and degrade sight distance at crossings and intersections.

BENEFITS

Reduces Winter Pedestrian Risk: Improves traction and visibility at crossings, sidewalks, curb ramps, and school routes where slip-and-fall and vehicle-pedestrian risks are highest.

Supports Vulnerable Users: Prioritizes access for children, older adults, mobility-device users, and caregivers during winter conditions.

Prevents Secondary Crashes: Reduces stopping distance issues, turning conflicts, and sight-distance limitations caused by snowbanks and ice buildup.

Cost-Effective Safety Strategy: Focuses existing maintenance resources where safety benefits are greatest rather than increasing overall effort.

Safe System Alignment: Addresses seasonal risk proactively instead of reacting to crashes or injuries.

Equity-Focused: Helps ensure consistent winter access across neighborhoods, not just major vehicle corridors.

CONSTRAINTS AND LIMITATIONS

Resource Constraints: Staffing, equipment, and weather severity may limit the speed of response.

Operational Tradeoffs: Prioritizing pedestrian routes may require adjustments to traditional plowing sequences.

Coordination Needs: Responsibilities may be shared among Public Works, schools, private property owners, and NDOT.

Enforcement Limitations: Snow storage and sidewalk clearing on private frontage may depend on local ordinance compliance.

Extreme Weather: Severe storms may temporarily exceed operational capacity despite prioritization.

TYPICAL APPLICATIONS

School walking routes and crossings.

Downtown sidewalks, curb ramps, and pedestrian crossings.

Transit stops, park access points, and community facilities.

Intersections where snowbanks restrict sight distance.

Routes serving medical, senior, or disability-related destinations.

DESIGN & OPERATIONAL CONSIDERATIONS

Priority Network Definition: Identify and map high-priority pedestrian routes, crossings, and curb ramps for first-response clearing.

Intersection Management: Include snowbank removal at corners and medians to preserve sight distance.

Curb Ramp Accessibility: Ensure ramps and landings are cleared concurrently with sidewalks.

Timing: Align clearing schedules with school arrival/dismissal and peak pedestrian activity.

Equipment Planning: Use appropriate equipment for sidewalks, crossings, and constrained downtown areas.

Policy Integration: Align snow and ice policies with ADA transition plans and municipal codes.

NDOT Coordination: Coordinate responsibilities where pedestrian facilities are located along state highways.

ONLINE REFERENCES

FHWA – Pedestrian Safety and Winter Maintenance https://safety.fhwa.dot.gov/ped_bike/

FHWA – Safe System Approach https://www.transportation.gov/road-safety/safe-system

ADA – Maintenance of Accessible Routes https://www.ada.gov/resources/streets-sidewalks/

AASHTO – Winter Maintenance Guidance

NDOT – Snow and Ice Control Practices

> ***SS4A Eligibility Note***
>
> *Snow and ice removal prioritization is an SS4A-eligible operational countermeasure when tied to pedestrian exposure risk, accessibility needs, and seasonal safety concerns. It directly advances the Safe System Approach by reducing winter-specific crash and injury risk without requiring capital construction.*

marking refresh cycles



pavement marking refresh cycles

CM-22 Pavement Marking Maintenance & Refresh Program

Pavement marking refresh cycles establish a proactive, scheduled approach to maintaining lane lines, crosswalks, stop bars, edge lines, and other critical markings to preserve visibility, driver expectancy, and pedestrian safety—particularly on high-speed or high-conflict roadways.

This countermeasure focuses on consistency and reliability, ensuring markings do not degrade to unsafe levels before being refreshed.

PROBLEM ADDRESSED

Faded or inconsistent pavement markings reduce driver expectancy and pedestrian visibility, increasing crash risk—particularly at crossings and intersections.

BENEFITS

Improves Visibility: Maintains clear guidance for drivers and pedestrians in all lighting and weather conditions.

Supports Pedestrian Safety: Ensures crosswalks, stop bars, and yield lines remain conspicuous and effective.

Reduces Driver Error: Reinforces lane discipline and turning expectations, especially on wide or complex roadways.

Low-Cost, High Impact: Maximizes safety benefits from existing infrastructure through routine maintenance.

Safe System Alignment: Reduces reliance on perfect driver behavior by maintaining clear visual cues.

NDOT Compatibility: Aligns with state highway maintenance and operational standards.

CONSTRAINTS AND LIMITATIONS

Ongoing Maintenance Commitment: Requires sustained funding and scheduling.

Weather Impacts: Snowplows, sanding, and winter conditions accelerate wear.

Material Performance: Some marking materials may degrade faster depending on traffic volumes and truck percentages.

Coordination Needs: State highways require NDOT coordination for materials, timing, and standards.

TYPICAL APPLICATIONS

High-volume corridors and state highways through town.

School zones, downtown areas, and pedestrian crossings.

Intersections with complex geometry or turning movements.

Locations with documented lane confusion or near-miss conflicts.

Corridors with frequent resurfacing or utility work.

DESIGN & OPERATIONAL CONSIDERATIONS

Inventory & Condition Tracking: Maintain a map or log of marking condition and refresh schedules.

Priority Markings: Emphasize crosswalks, stop bars, yield lines, edge lines, and lane transitions.

Material Selection: Use durable, high-visibility materials suitable for snowplow operations.

Seasonal Timing: Schedule restriping to align with resurfacing and minimize winter degradation.

Consistency: Apply markings uniformly along corridors to avoid driver confusion.

NDOT Coordination: Coordinate marking types, widths, and materials on US-26, US-385, and other state routes.

Evaluation: Use crash data, public input, and field observations to adjust refresh frequency.

ONLINE REFERENCES

MUTCD – Part 3: Pavement Markings https://mutcd.fhwa.dot.gov

FHWA – Proven Safety Countermeasures https://safety.fhwa.dot.gov/provencountermeasures/

FHWA – Safe System Approach https://www.transportation.gov/road-safety/safe-system

AASHTO – Roadway Markings and Materials Guidance

NDOT – Pavement Marking Standards & Maintenance

> ***SS4A Eligibility Note***
>
> *Pavement marking refresh programs are SS4A-eligible implementation actions when tied to documented safety needs, pedestrian exposure, and systemic risk reduction. Maintaining visibility is a foundational Safe System strategy that reduces crash severity and driver error without increasing roadway complexity.*



distracted driving education

CM-23 Driver Education & Distracted Driving Prevention Program

An education-first safety countermeasure that focuses on increasing awareness of distracted driving risks—particularly cell phone use—through outreach, messaging, and community engagement before or alongside targeted enforcement.

BENEFITS

Reduces High-Risk Behaviors: Addresses one of the most common contributing factors to crashes, especially in small communities with frequent short trips.

Supports Safe System Principles: Emphasizes shared responsibility and behavior change rather than **punishment alone.**

Builds Community Buy-In: Education-first approaches are generally well-received and reinforce that safety improvements are meant to protect everyone.

Complements Engineering Treatments: Reinforces the purpose of new crosswalks, striping, school zones, and speed treatments.

Low Cost, High Reach: Can be implemented using existing city channels, schools, employers, and community events.

CONSTRAINTS AND LIMITATIONS

Behavior Change Takes Time: Education alone may not produce immediate or lasting compliance without reinforcement.

Limited Measurability: Changes in distracted driving behavior can be difficult to quantify directly.

Message Saturation: Overuse of generic messaging can reduce effectiveness.

Requires Consistency: One-time campaigns are less effective than recurring, targeted messaging.

TYPICAL APPLICATIONS

School & Park Areas: Outreach focused on drop-off/pick-up behavior and pedestrian awareness.

Main Street & Downtown: Messaging tied to yielding, parking maneuvers, and pedestrian visibility.

Community Events: Use of local events, utility bill inserts, social media, and signage.

Post-Improvement Rollout: Education paired with new striping, crossings, or traffic pattern changes.

Seasonal Campaigns: Reinforcement during high-travel periods or community events.

DESIGN CONSIDERATIONS

Local Context: Use local imagery, locations, and examples rather than generic statewide messaging.

Clear Focus: Emphasize specific behaviors (phone use, inattention at crosswalks, turning movements).

Positive Framing: Focus on protecting neighbors, children, and elders rather than punitive messaging.

Coordination with Enforcement: Pair education with limited, well-communicated enforcement when appropriate.

Equity & Accessibility: Ensure materials are accessible, culturally appropriate, and easy to understand.

Evaluation: Track engagement metrics (reach, participation) and coordinate with observed compliance trends.

ONLINE REFERENCES

FHWA — Distracted Driving Overview & Countermeasures [1] https://safety.fhwa.dot.gov/roadway_dept/countermeasures/

NHTSA — Countermeasures That Work: Distracted Driving [2] https://www.nhtsa.gov/road-safety/countermeasures

FHWA — Safe System Approach [3] https://www.fhwa.dot.gov/safety/zero-deaths/safe-system/

CDC — Motor Vehicle Crash Injury Data & Prevention [4] https://www.cdc.gov/transportationsafety/

CM-23 Driver Education & Distracted Driving Prevention Program

Primary Focus:

High school driver education curriculum enhancement

Distracted driving risk reduction (cell phone use, inattention)

Safe yielding and school-area behavior

Structure:

Integration into formal driver's education programs

Public awareness campaign (community-wide)

Coordination with school district, law enforcement, and PPHD

Reinforcement through targeted enforcement (CM-24)



targeted data-supported enforcement

targeted, data-supported enforcement
\ mcs concept

CM-24 Targeted, Data-Driven Enforcement

A focused enforcement approach that uses crash data, speed data, community input, and observed risk patterns to direct limited enforcement resources to the highest-risk locations, behaviors, and times, rather than applying blanket or punitive enforcement across the community.

PROBLEM ADDRESSED

Distracted driving—particularly mobile device use—along with failure to yield and context-specific speeding contributes to crashes and near-misses in Bridgeport, especially during short, local trips and near schools, parks, and downtown areas.

BENEFITS

Improves Safety Outcomes: Concentrates enforcement where risk is highest (speeding corridors, school zones, documented near-miss locations), improving compliance with traffic laws most closely tied to serious injury risk.

Aligns with Safe System Principles: Emphasizes behavior change and risk reduction rather than punishment alone, supporting shared responsibility for safety.

Builds Public Trust: Transparent, data-driven deployment reduces perceptions of arbitrary or unfair enforcement.

Efficient Use of Resources: Maximizes impact with limited staffing by focusing on locations, times, and behaviors with documented safety concerns.

Supports Vulnerable Users: Prioritizes enforcement near schools, parks, crossings, and areas with pedestrian and bicycle activity.

CONSTRAINTS AND LIMITATIONS

Not a Standalone Solution: Enforcement must be paired with engineering, education, and operations to achieve lasting safety outcomes.

Staffing Dependent: Effectiveness depends on available personnel and coordination with other public safety priorities.

Behavioral Fatigue: Short-term improvements may diminish without reinforcement or complementary physical treatments.

Equity Considerations: Requires careful design to avoid disproportionate impacts on specific populations or neighborhoods.

TYPICAL APPLICATIONS

School Zones: Targeted speed and yielding enforcement during arrival and dismissal periods.

High-Risk Corridors: Locations with documented speeding, failure-to-yield, or near-miss patterns.

Seasonal or Time-Based Issues: Harvest traffic, recreational travel periods, or special events.

Post-Implementation Support: Temporary enforcement following new striping, signage, or traffic pattern changes to reinforce driver understanding.

Complaint-Driven Locations: Areas repeatedly identified through surveys, online maps, or resident feedback.

DESIGN CONSIDERATIONS

Data Inputs: Use crash history (including injury crashes), speed studies, yielding observations, and community comments to guide deployment.

Transparency: Clearly communicate why enforcement is occurring, what behaviors are targeted, and how locations were selected.

Education-First Messaging: Pair enforcement with public education, warnings, or outreach before issuing citations where appropriate.

Coordination: Align enforcement timing with engineering changes (new crosswalks, speed feedback signs, school zone upgrades).

Performance Tracking: Monitor changes in speeds, compliance, and crash patterns to evaluate effectiveness and adjust strategy.

Policy Alignment: Ensure enforcement priorities align with adopted plans, Vision Zero goals, and municipal authority.

Enforcement strategies should emphasize visibility, warnings, and reinforcement of new or existing safety treatments before relying on citation-based approaches.

ONLINE REFERENCES

FHWA — Speed Management Safety Toolkit [1] https://safety.fhwa.dot.gov/speedmgt/

FHWA — Safe System Approach [2] https://www.fhwa.dot.gov/safety/zero-deaths/safe-system/

NHTSA — Countermeasures That Work: Speed Management & Enforcement [3] https://www.nhtsa.gov/road-safety/countermeasures

FHWA — Equitable Enforcement and Safety [4] https://www.transportation.gov/mission/health-equity





youth bike ped safety ed

targeted, data-supported enforcement

CM-25 Youth Bicycle & Pedestrian Safety Education Program

A coordinated youth safety education program focused on bicycle, pedestrian, and micro-mobility skills for children and teens. The program would include bike rodeos, hands-on safety training, helmet fitting, and age-appropriate instruction on safe street crossings, visibility, and traffic awareness. Activities would be delivered through schools, community events, and partnerships with local organizations and law enforcement.

This approach prioritizes enforcement of behaviors most closely linked to serious injury and fatal crashes, including speeding, failure to yield, and distracted driving.

KEY ELEMENTS

Bike rodeos with skills courses (starting, stopping, turning, signaling, scanning)

Helmet fitting and distribution, as available

Safe street crossing education for youth pedestrians and bicyclists

Visibility and conspicuity education (lighting, reflective gear)

Rules of the road for bicyclists and shared-use paths

Police-led or Extension-supported safety demonstrations

Integration with existing events (school safety days, community festivals, summer programs)

TARGET LOCATIONS & USERS

School areas (elementary and middle schools)

Parks and recreation areas

Neighborhoods with identified pedestrian and bicycle activity

Youth and families, with emphasis on elementary and middle school students

SAFETY ISSUES ADDRESSED

Lack of youth understanding of safe bicycling and walking behaviors

Bicycle–vehicle conflicts near schools and parks

Improper helmet use and low visibility
Inconsistent exposure to traffic safety education at early ages

SS4A & SAFE SYSTEM ALIGNMENT

This countermeasure supports the Safe System Approach by addressing safer road users through education, visibility, and predictable behavior.

It complements engineering and enforcement strategies by reducing exposure risk and improving decision-making among young roadway users.

IMPLEMENTATION PARTNERS

Bridgeport Public Schools

UNL Extension

Morrill County Sheriff's Office
Panhandle Public Health District (PPHD)

Local service organizations and community volunteers

COST & TIMEFRAME

Cost: Low

Timeframe: Short-term / Ongoing

Implementation Type: Non-Infrastructure (SS4A-eligible)

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