



2025

WORK ZONE

Positive Protection

GUIDE & EVALUATION FORM



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1. INTRODUCTION

1.1 Purpose

The Positive Protection Guide in Work Zones establishes the technical, strategic, and regulatory framework for the evaluation, selection, and implementation of positive protection devices in road construction, maintenance, or rehabilitation projects in Puerto Rico, under the jurisdiction of the Puerto Rico Highway and Transportation Authority (PRHTA) and the Department of Transportation and Public Works (DTPW).

The purpose of this guide is to serve as a supporting tool for design personnel, inspectors, project managers, and contractors, enabling informed decisions on when and how to use positive protection in order to:

- Reduce the risk of collisions involving workers, pedestrians, and temporary structures.
- Guarantee safety conditions during construction, maintenance and rehabilitation activities.
- Comply with applicable technical and legal standards.

This guide applies to all phases of project development, from initial planning through construction, and is primarily intended for highway projects receiving federal funding, in accordance with the requirements of 23 CFR 630 Subpart K. It is highly recommended as a criterion for state or municipal projects adopting the best practices described herein.

1.2 What is Positive Protection?

Positive protection refers to the use of certified physical devices, such as temporary concrete barriers, modular plastic barriers, and mobile steel barriers, among others, designed to contain or redirect out-of-control vehicles in work zones.

Their primary function is to mitigate the risk of vehicular intrusion into areas occupied by workers, equipment, pedestrians, or temporary structures.

These devices must comply with the requirements established by the Manual for Assessing Safety Hardware (MASH), published by AASHTO, and/or the NCHRP Report 350, when applicable.

1.3 Regulatory Framework

This guide is based on federal and state regulations that require agencies to consider, evaluate, and integrate the use of positive protection as part of the design and implementation of roadway projects. Specifically, 23 CFR 630 Subpart K requires state agencies to:

- Systemically consider the use of positive protection in their projects.
- Justify its installation or exclusion through an engineering study.
- Integrate this decision as part of the project's Transportation Management Plan (TMP).

This guide is not a standalone document; it must be used in conjunction with other standards, guides, manuals, and technical design tools relevant to Puerto Rico's context. These include:

- Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways, as adopted by DTPW and PRHTA.
- Manual de Rotulación para las Vías Públicas de Puerto Rico
- AASHTO Roadside Design Guide (RDG)
- Manual for Assessing Safety Hardware (MASH)
- PRHTA Standard Drawings
- PRHTA Design Directives and Specifications

2. DEFINITIONS

The following are key terms and concepts used throughout this guide. Understanding these definitions is essential for the proper application of the criteria and procedures related to positive protection in work zones.

2.1 Positive Protection Device

A physical device designed to contain or redirect vehicles that enter a work zone. To be considered a positive protection device, it must meet industry-recognized impact performance evaluation criteria, such as those established by MASH or NCHRP Report 350.

2.2 Engineering Study

Technical analysis that evaluates relevant data and applies engineering principles to determine the need for and type of positive protective measures, exposure control measures, or other temporary traffic control measures.

2.3 Exposure Control Measures

Traffic management strategies intended to eliminate, reduce, or divert motorized traffic away from work zones to avoid collisions with workers. Examples include full road closures, temporary detours, off-peak construction phases and restricted access.

2.4 Alternate Traffic Control Measures

Strategies that complement positive protection or exposure control and help reduce crash risk. These may include:

- Police presence or enforcement
- Speed reductions
- Portable changeable message signs (PCMS)
- Temporary signing and channelizing devices

These measures do not replace positive protection but may be considered as part of the risk mitigation analysis.

2.5 Work Zone

A section of roadway that is temporarily affected by construction, maintenance, or inspection activities. It includes the physical area occupied by workers, equipment, materials, and traffic control devices, as well as the transition areas leading into and out of the site.

2.6 No Means of Escape

A location where workers do not have a visible, accessible, or unobstructed path to retreat quickly in the event of a vehicle intrusion. Examples include tunnels, bridges, elevated structures, narrow medians, or confined spaces.

3. POSITIVE PROTECTION DEVICES

Positive protection devices are physical elements specifically designed and certified to contain, redirect, or decelerate out-of-control vehicles, thereby protecting workers, pedestrians, temporary infrastructure or vulnerable users within the work zone. All devices used in projects under the jurisdiction of PRHTA must comply with current impact performance evaluation criteria (e.g., MASH).

3.1 Types of Devices

The following are the main types of approved positive protection devices for use in construction, maintenance, or rehabilitation projects under the jurisdiction of PRHTA/DTPW:

a. Temporary Concrete Barriers



- Type F (non-anchored): A rigid containment device placed directly on the pavement surface. Suitable for separating vehicle flows, pedestrian protection, and exposed edges in low- to medium-exposure zones. Offers high containment capacity.



- Type F (anchored): An anchored variation recommended where higher containment is required or lateral space is limited. Typically used on bridges, confined areas, or near steep slopes.

b. Modular Plastic Barriers



- Interconnected devices made of high-density polymer, filled with water or other materials. Must be certified under MASH TL-2 or MASH TL-3, depending on the expected speed.
- Recommended for urban zones, pedestrian separations, low-speed areas, or locations requiring easy installation and removal.

c. Mobile Barrier System



- MBT-1: Modular steel systems certified under MASH, designed to be deployed, repositioned, and removed rapidly.

- Provide continuous protection for workers during mobile or repetitive operations, including night work or high-exposure highways.
- Typically used on ramps, access points, medians, and phased bridge construction.

d. Movable Barrier System (Concrete or Metal)



- These are standard concrete or metal barriers that are repositionable using heavy equipment but are not rapid-deployment systems like MBT-1.

- Often used to reconfigure lane alignments between work phases or shift traffic patterns.
- May be appropriate for longer-duration projects that require occasional barrier relocation with crane or loader support.

e. End Treatments



- All barrier systems (concrete, metal, or modular) must include appropriate end treatments when the barrier terminals are exposed to traffic.
- End treatments must:
 - Comply with applicable MASH criteria.
 - Be compatible with the barrier type.
 - Be installed in accordance with the manufacturer's instructions and PRHTA's standards.

e. Impact Attenuators



- Includes vehicles equipped with Truck-Mounted Attenuators (TMAs) and mobile crash cushions.
- Provide temporary protection during short-duration operations or while installing other positive protection devices.
- Do not replace fixed barriers but are considered an integral part of temporary protection strategies.

3.2 General Requirements for Use

- All devices must be certified under MASH or the applicable standard based on their date of manufacture.
- Devices must be installed according to manufacturer specifications, including minimum length, anchoring type, and ground conditions.
- For use on bridges or elevated structures, structural compatibility (weight and anchorage) must be verified.
- The selected devices must align with the project's TMP and be reflected in the design plans and technical specifications.

4. TECHNICAL EVALUATION FOR THE USE OF POSITIVE PROTECTION

The decision to implement positive protection devices in work zones must be based on a structured technical evaluation, documented through an engineering study. This evaluation must consider the specific conditions of the project and apply professional judgment to determine the level of risk present.

4.1 Key Factors to Consider

The following factors should be evaluated in each project, preferably during the design or planning stage, to determine whether the use of positive protection is warranted:

a. Type of Work

Activities such as roadway widening, bridge reconstruction, slab replacement, demolition, or installation of structural elements that expose workers directly to live traffic.

b. Worker exposure to traffic

Physical proximity to active lanes, absence of buffer space, or prolonged tasks in confined or restricted areas without clear escape routes (no means of escape).

c. Traffic volume (AADT)

The risk of work zone crashes increases when volumes exceed 10,000 vehicles/day. Fluctuations between free-flow and congested conditions should also be considered.

d. Operating speed

Areas with prevailing speeds of ≥ 50 mph present increased crash severity risk. Use the actual operating speed, not just the posted speed limit.

e. Roadway geometry

Sharp curves, limited visibility, narrow lanes, and areas with no shoulder may require physical barriers to protect workers.

f. Heavy Vehicles and Vehicle Mix

A high proportion of trucks or heavy vehicles increases the potential severity of collisions in work zones.

g. Visibility and time of day

Night work or operations under low-visibility conditions increase risks. Consider lighting, retroreflectivity of signing, and the presence of night crews.

h. Proximity of traffic to temporary objects or sensitive structures

If falsework, heavy equipment, stored materials, or elevated zones cannot be relocated outside the clear zone, they should be protected.

i. Entry/exit of vehicles from the work area

Frequent movement of construction vehicles or equipment increases exposure and should be considered in the analysis.

j. Accessibility of escape routes for workers

A no-escape zone (no means of escape) is any location without a clear and unobstructed path for workers to quickly move to safety in the event of a vehicle intrusion (e.g., tunnels, bridges, narrow medians, or confined spaces).

4.2 Additional Considerations

- If the project is of long duration (more than 3 days) and requires continuous worker presence near active traffic lanes, it is recommended that a formal engineering study be conducted.
- Before implementing positive protection devices, mitigation alternatives should be evaluated, such as traffic reconfiguration, full closures during off-peak hours, or traffic detours.
- Installing and removing barriers also poses a risk to workers. The feasibility and safety of deploying such devices should be part of the evaluation.

5. TYPICAL APPLICATIONS AND EVALUATION REQUIREMENTS

This section provides a practical guide to identifying situations in which positive protection is required, must be evaluated through an engineering study, or is not required—based on the type of activity, roadway configuration, and project-specific operational conditions.

The goal is to provide designers and project teams with a clear tool to apply criteria consistently and in compliance with federal and state-level requirements. It is important to emphasize that professional judgment and the specific context of each project must always be considered to determine the most appropriate solution.

5.1 Applications Where Positive Protection is Required

These conditions involve elevated risks to workers, pedestrians, or temporary structures, and require the installation of physical positive protection devices without the need for an engineering study to justify their use. The device installation must be directly incorporated into the project plans, TMP, and applicable specifications.

Typical Application	Recommended Device(s)
Temporary containment structures [e.g., earth walls, trenches, deep excavations with a depth ≥ 0.30 m (1 foot) and a duration of more than one day]	Type F temporary concrete barrier
Bridge piers or columns	Anchored temporary concrete barrier or mobile barrier system (MBT-1)
Non-traversable slopes or abrupt embankments	Anchored temporary concrete barrier
Bridge construction in stages/phases	Type F temporary concrete barrier or movable metal/concrete barriers
Temporary separation of opposing traffic on roadways ≥ 50 mph	Type F temporary concrete barrier or movable metal/concrete barriers

5.2 Applications Requiring Evaluation Through an Engineering Study

These scenarios require a formal technical analysis to determine whether positive protection installation is justified, considering factors such as worker exposure, speed, duration, and location.

Typical Application	Recommended Device(s)
Sign supports or temporary structures installed over the roadway	Type F temporary concrete barrier or movable metal/concrete barriers
Phased installation of pipes or culverts	TL-2 modular plastic barrier
Storage of materials or equipment within the active work zone	Type F temporary concrete barrier or movable metal/concrete barriers
Direct exposure of workers without a clear escape path (no means of escape)	Type F temporary concrete barrier or mobile barrier system (MBT-1)
Urban areas with significant pedestrian or cyclist activity	TL-2/TL-3 modular plastic barriers or movable metal barriers
Primary roadways without alternate routes and limited lateral space	Type F temporary concrete barrier or movable metal/concrete barriers
Non-removable temporary objects within the clear zone	Anchored temporary concrete barrier

5.3 Illustrations of Typical Applications

Typical applications from the MUTCD are referenced in Appendix A to complement this section. These include:

- **TA-5:** Shoulder closure on freeways or expressways
- **TA-34:** Lane closure using temporary barriers
- **TA-36:** Lane closure with lateral shift
- **TA-39:** Median crossover to redirect lanes
- **TA-45:** Temporary reversible lanes using movable barriers

6. MITIGATION MEASURES

Mitigation measures are complementary or alternative strategies that can be used to reduce the risk of vehicular intrusion or worker exposure when the use of positive protection is not feasible, necessary, or practical, as determined by an engineering study.

These measures help manage risk through exposure control, traffic management, or operational adaptations and must be documented in the project's Transportation Management Plan (TMP).

6.1 Exposure Control Measures

These strategies aim to reduce the presence of traffic near the work area by eliminating or minimizing the risk of intrusion:

- Full lane closures or the use of temporary detours to remove traffic from the work zone.
- Lane reductions with redistribution of traffic to alternate routes.
- Performing work during off-peak hours or at night when traffic volumes are lower.
- Reconfiguring construction phasing to minimize direct exposure to live traffic.
- Extending shoulders or creating temporary buffer zones using signing and channelizing devices.

6.2 Operational measures and traffic control

These strategies are applied within the work zone when exposure cannot be fully eliminated:

- Strategically placed Truck-Mounted Attenuators (TMAs) to shield workers.
- Speed reduction using enhanced signing, physical devices, or technology.
- Use of law enforcement patrol units or visible police presence to encourage caution.
- Temporary traffic signals to manage conflicting flows or narrow sections.

- Enhanced channelization devices (drums, cones, and barricades with increased reflectivity).

6.3 Worker Safety Measures

These strategies focus directly on protecting personnel during device installation, removal, or ongoing work activities:

- Controlled access planning for equipment and personnel entry and exit.
- Clear, unobstructed escape routes for workers.
- Worker rotation to prevent fatigue in high-risk conditions.
- High-visibility apparel, communication radios, and active monitoring in critical zones.
- Specific training on response procedures for vehicle intrusion incidents.

6.4 Implementation and Documentation

When a decision is made not to install positive protection devices, the designer is responsible for developing an engineering study that must:

- Provide a technical justification for the decision.
- Identify the specific mitigation measures to be implemented.
- Include these strategies in the project's TMP.
- Evaluate their effectiveness during construction and adjust as needed based on actual field conditions.

7. ENGINEERING STUDY

The purpose of the engineering study is to systematically analyze and document whether a roadway construction or maintenance project requires the use of positive protection devices, or whether mitigation measures may be implemented as an alternative. The final decision must be made by the project engineer and documented in the project file.

All federally funded projects under the jurisdiction of the Puerto Rico Highway and Transportation Authority (PRHTA) and the Department of Transportation and Public Works (DTPW) must include a technical determination regarding the use of positive protection in the project file.

7.1 Technical Evaluation Process

The evaluation must follow a structured approach based on the assessment of risk factors within the project's work zone. This includes the following steps:

Step 1: Review of Mandatory Requirements

Verify if project conditions, based on policy or technical specification, require the use of positive protection devices (see Section 5 and Table of Typical Applications).

Note: In cases where the application of positive protection is mandatory, an engineering study and evaluation form are not required. The installation of the device must be reflected directly in the project plans, the TMP, and relevant specifications.

Step 2: Risk Analysis by Work Activity

Conduct a risk analysis for each work zone based on the following factors:

a. Work Duration

The risk of impact from out-of-control vehicles increases with the amount of time workers remain unprotected in the active work area. The longer the duration of work at a given location, the higher the need for implementing positive protection.

Short-duration work, such as minor repairs, temporary sign placement, or adjustment of traffic control devices, generally presents lower risk. However, alternative measures such as stationary truck-mounted attenuators (TMAs) or mobile barrier systems should be considered, especially under high speed or traffic volume conditions.

The following table presents the risk level according to the estimated duration of the activity:

Duration of Specific Work Zone Activity	Risk Level
Long-term stationary work greater than six (6) months	Very High
Long-term stationary work from three (3) months to six (6) months	High
Long-term stationary work from more than three (3) days and less than three (3) months	Moderate
Intermediate stationary work [more than one (1) day up to three (3) days]	Low
Short-term stationary, short-duration or mobile.	Very Low

Notes:

1. *Intermediate stationary work:* Occupies a location for more than one (1) day up to three (3) consecutive days, or nighttime work lasting over an hour.

- 2. *Short-term stationary*: Occupies a location for more than one (1) hour during a single daytime period.
- 3. *Short-duration or mobile work*: Occupies a location for one (1) hour or less, typically for mobile or quick maintenance operations.

b. Worker Exposure

Activities conducted near live traffic lanes, especially at high speeds, present increased risk to workers. The closer the lateral distance (buffer) between the worker and adjacent traffic, the greater the need for positive protection.

This factor assesses how close workers are to active traffic flow and whether there is enough space to react or escape from a potential intrusion.

The following table presents the level of the risk according to the available lateral space:

Lateral Distance Between Workers and Live Traffic Lane	Risk Level
Less than 1.8 meters (6 feet)	High
Between 1.8 and 4.6 meters (6 and 15 feet)	Moderate
Greater than 4.6 meters (15 feet)	Low

c. Posted Speed

The severity of impacts to workers or pedestrians increases with vehicle speed. Therefore, the posted speed limit is a key factor in determining the need for positive protection.

Use the legally established speed limit prior to construction activity, not any temporary reduced speed within the work zone. The 85th percentile speed may also be considered, if appropriate.

The following table presents the risk level based on the maximum posted speed in miles per hour (mph):

Posted Speed (mph)	Risk Level
55 or more	Very high
40–50	High
30–35	Moderate
25 or less	Low

d. Work Zone Location

Worker risk increases significantly in areas where there is no clear escape route in case of vehicle intrusion. This factor evaluates the physical environment of the work zone and the workers’ ability to move quickly to safety.

Positive protection should be prioritized in the following cases:

- Confined spaces
- Bridges
- Tunnels
- Deep excavations
- Cuts or embankments with stee slopes (greater than 2:1)
- Roadways with no lateral clearance

The risk level table associated with this factor is presented below:

Location Type	Risk level
Bridge structures, drop-offs ≥ 0.60 m (2 feet), fills or cuts $> 2:1$, or confined areas with no escape route for workers (no means of escape)	High
Areas with barriers or obstacles that hinder, but allow a reasonable escape route	Moderate
Areas with clear and viable escape routes to safe zones	Low

Step 3: Scoring and Determination

Once all risk factors (duration, exposure, speed, location) have been evaluated, the scores should be added to calculate a total risk score. This score will determine the appropriate level of intervention—either through positive protection devices or mitigation measures.

Total Score	Required Action
30 points or more	Positive work zone protection devices shall be installed.
20-30 points	Positive work zone protection devices should be installed where feasible. If positive protection is not installed, mitigation measures shall be implemented to reduce exposure to risk.
< 20 points	Standard temporary traffic control devices may be used.

The final score must be documented in the Positive Protection Evaluation Form (see Appendix B), which must also include technical justifications, proposed additional measures, and any approved exceptions.

Step 4: Selection of Device or Mitigation Measure

Based on the risk analysis, select the appropriate positive protection device (see Sections 3 and 5) or applicable mitigation measures (see Section 6). If positive protection is not feasible, the decision must be justified on the form.

Step 5: Exceptions or Engineering Judgment

If the score indicates that positive protection is not required, but professional judgment deems it necessary, this must be documented as a justified exception. Similarly, if a required device cannot be installed due to field constraints, the exception section must be completed and approved by PRHTA.

Step 6: Signature and Filing

The form must be signed and sealed by the project designer and filed with the TMP documentation.

7.2 Documentation During Construction

During project execution, any significant changes in field conditions that would typically warrant the addition, removal, or modification of positive protection devices should be evaluated by the PRHTA Project Engineer. When such changes are consistent with PRHTA standards and supported by sound engineering judgment, they may be implemented without submitting a revised evaluation form. However, substantial deviations from the original plan, particularly those reducing protection, should be documented with appropriate technical justification and included in the project file for record-keeping and oversight purposes.

APENDIX A – Illustrations of Typical Positive Protection Applications

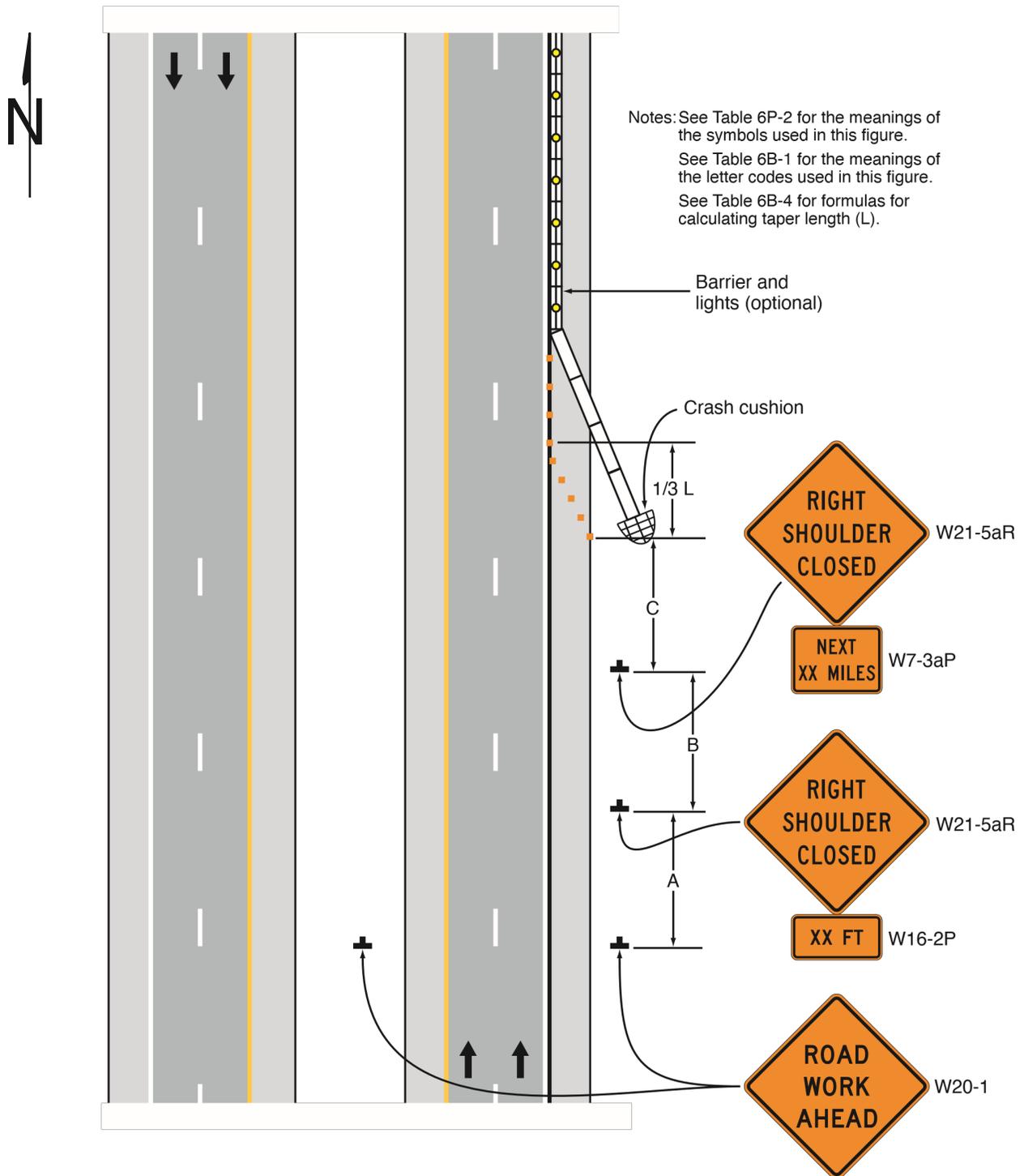


Figure A-1. Shoulder Closure on a Freeway (TA-5)

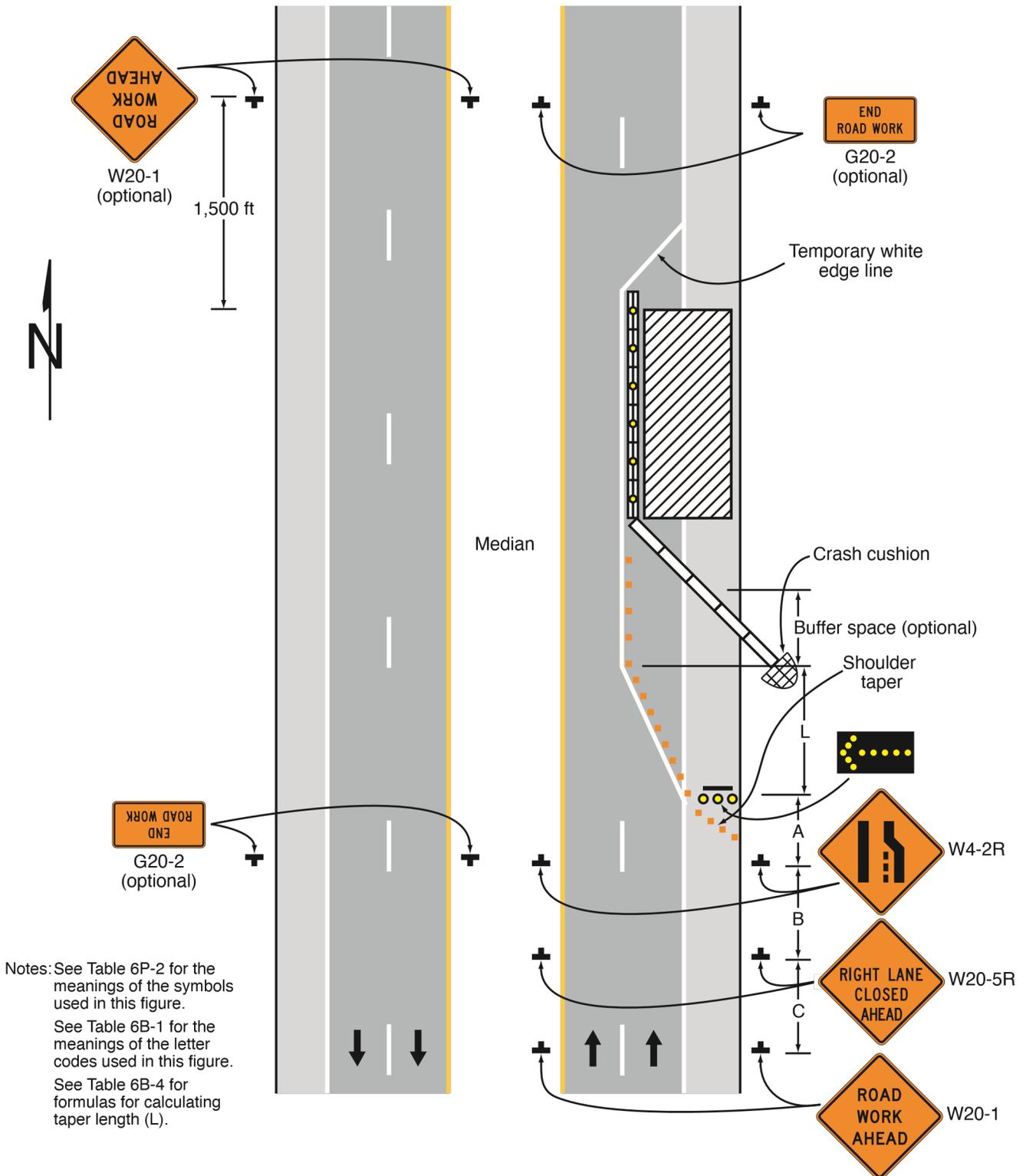


Figure A-2. Lane Closure with a Temporary Traffic Barrier (TA-34)

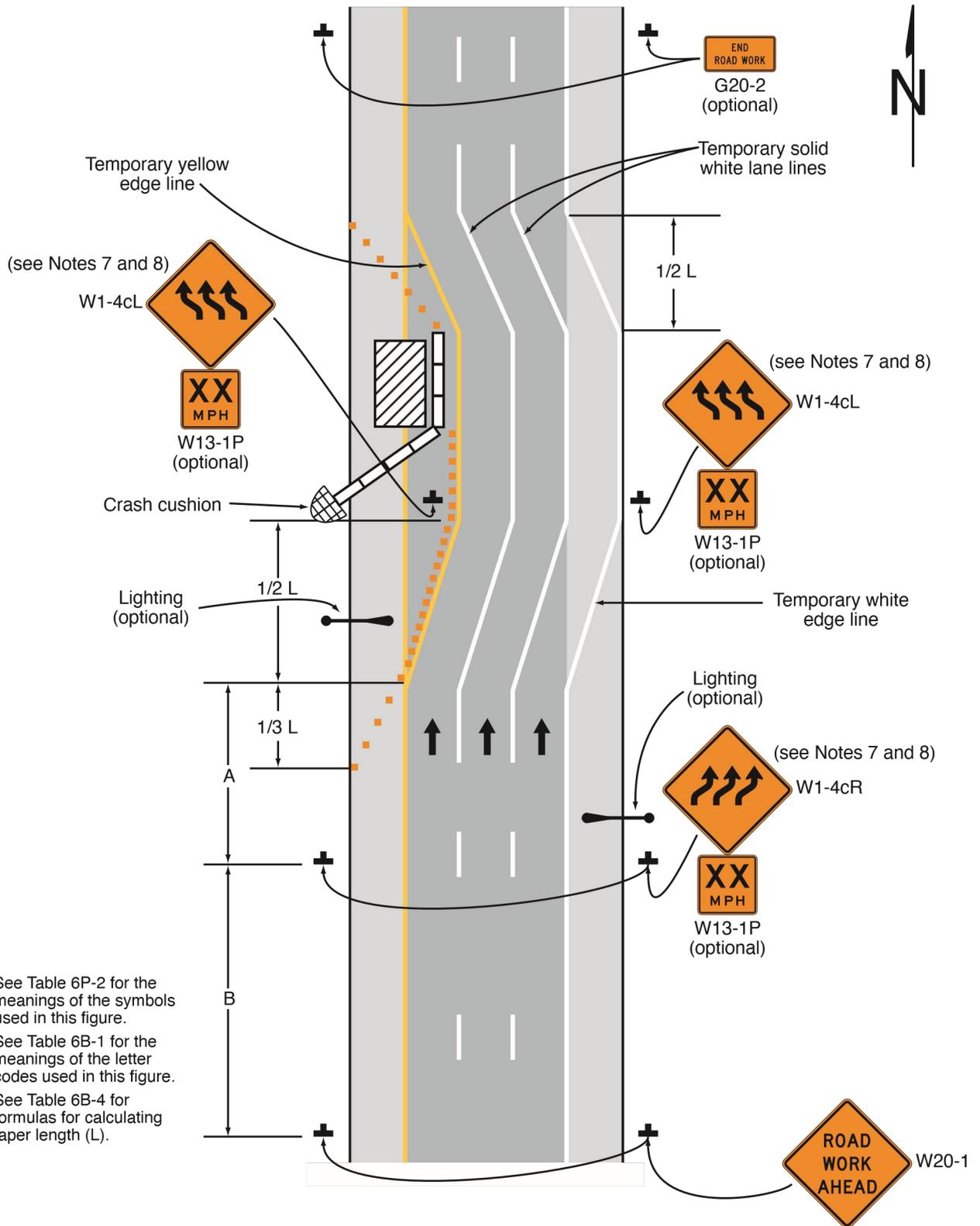


Figure A-3. Lane Shift on a Freeway (TA-36)

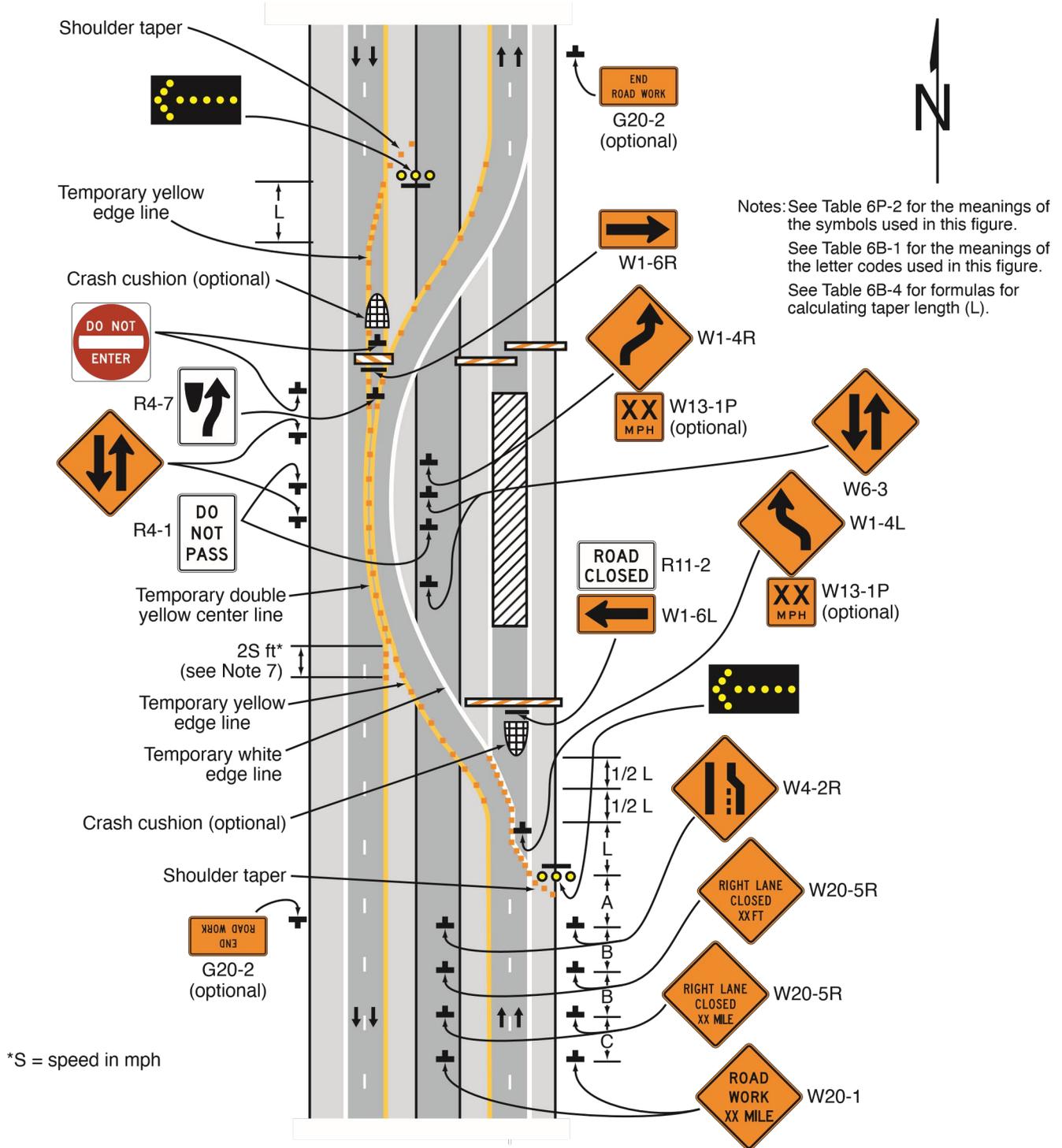


Figure A-4. Median Crossover on a Freeway (TA-39)

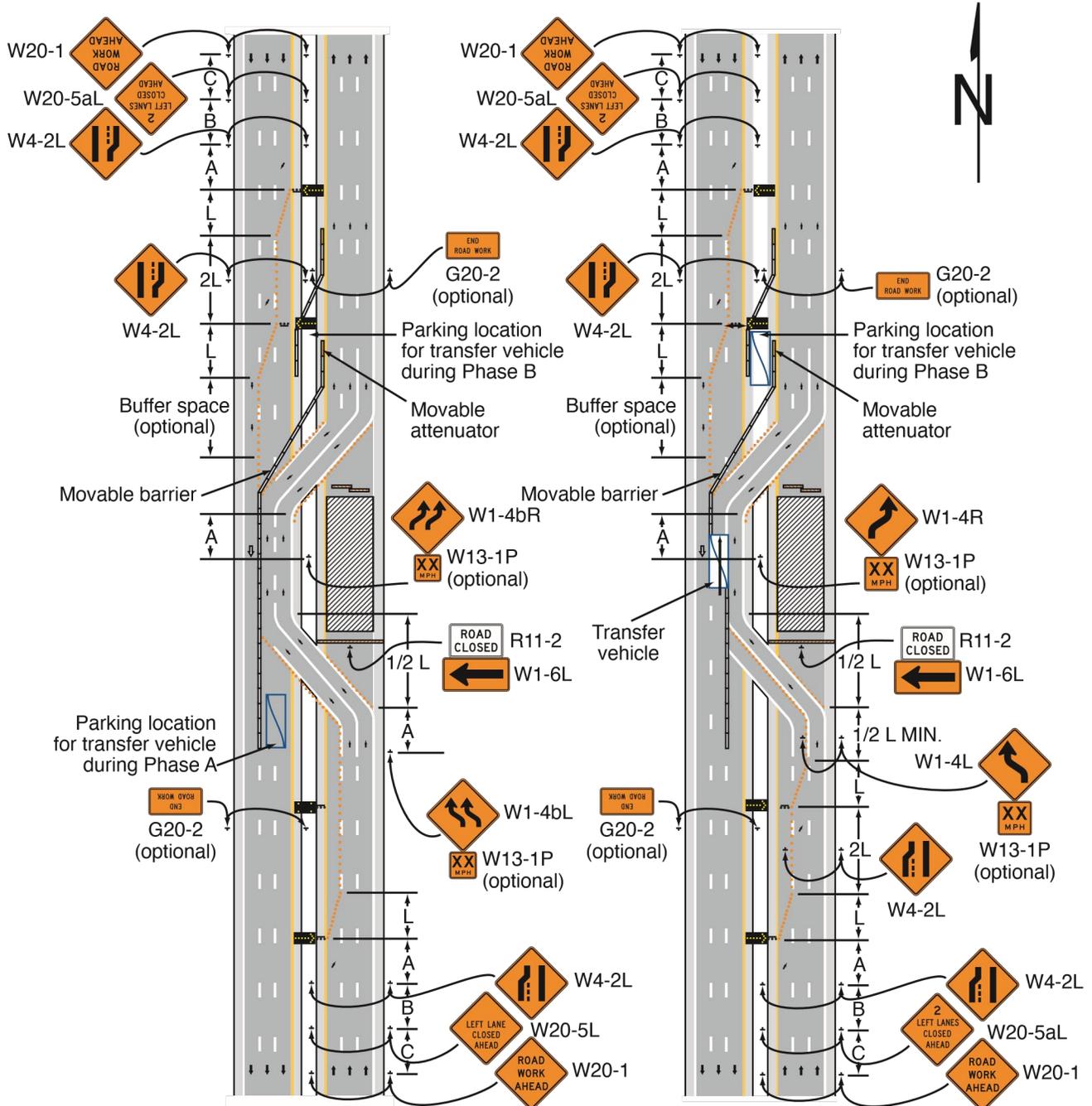


Figure A-5. Temporary Reversible Lane Using Movable Barriers (TA-45)

APPENDIX B – Positive Protection Evaluation Form

POSITIVE PROTECTION EVALUATION FORM

PROJECT DESIGNER/DESIGN CONSULTANT		PROJECT MANAGER	DATE
PROJECT NAME		AC NUMBER	FEDERAL NUMBER
MUNICIPALITY	ROAD NUMBER	BEGIN KILOMETER	END KILOMETER

REQUIRED POSITIVE WORK ZONE PROTECTION

Project requires positive work zone protection for the following:

(Check all that apply. These conditions require mandatory installation of positive protection without the need for an engineering analysis. They must be reflected in the TMP and project plans. If any condition applies and positive protection is not installed, a formal justification must be provided in the Exception section and approved by PRHTA.)

- Work adjacent to deep excavations with a depth of 0.30 m (1 foot) or more and a duration of more than one (1) day, trenches, or temporary containment structures that pose a risk of vehicle intrusion into the work zone.
- Proximity of work activities to unprotected structural elements such as bridge piers or columns.
- Bridge work involving phased construction that reduces lateral clearance or exposes workers to live traffic.
- Work near non-traversable slopes or abrupt embankments with a slope steeper than 4:1 or height differential ≥ 0.60 m (2 feet) within the clear zone.
- Temporary separation of opposing directions of travel on highways with speed limits ≥ 50 mph.

Project may require positive work zone protection based on engineering evaluation:

*(Check all that apply. These conditions require completion of engineering analysis and justification on this form. **Note:** If positive protection is selected by the designer based on engineering judgment, the risk analysis section may be skipped. Proceed to the Engineering Judgment / Exceptions section to document the decision.)*

- Installation of sign supports or temporary structures within the clear zone and exposed to live traffic.
- Phased installation of pipes or culverts that result in open trenches or confined work areas near traffic.
- Storage of materials or equipment within 4.60 m (15 feet) of an active traffic lane.
- Workers are exposed to live traffic in areas without an accessible escape route (e.g., narrow medians, tunnels, or bridges).
- Roadway lacks lateral space or alternate routes, increasing worker exposure.
- Work zone is located in high pedestrian or cyclist traffic areas (urban settings, shared-use paths).
- Temporary non-removable objects (e.g., formwork, equipment, shoring) are located within the clear zone.
- Other (specify): _____

WORK ACTIVITIES REQUIRING WORK ZONE ENGINEERING RISK ASSESSMENT

Complete the risk analysis for each applicable work zone segment identified. Evaluate the conditions based on duration, worker exposure, speed, and location. Use one form entry per unique configuration or phase. Select the most accurate condition under each factor and assign the corresponding score to determine the total risk rating.

POSITIVE PROTECTION EVALUATION FORM

AC NUMBER	MUNICIPALITY	ROAD NUMBER	BEGIN KILOMETER	END KILOMETER
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WORK ZONE ENGINEERING RISK ANALYSIS RATING

WORK ZONE NUMBER	ROAD NUMBER	DIRECTION	BEGIN POST MILE	END POST MILE	DURATION (Days)
	LOCATION		WORK ACTIVITY		STAGE/PHASE

For each factor based on your assessment choose which condition best describes the work area.

FACTOR 1 - DURATION OF SPECIFIC WORK ZONE ACTIVITY		POINTS	RATING
CHOOSE ONE CONDITION	LONG-TERM STATIONARY WORK GREATER THAN SIX (6) MONTHS	10	
	LONG-TERM STATIONARY WORK FROM THREE (3) MONTHS TO SIX MONTHS	8	
	LONG-TERM STATIONARY WORK FROM MORE THAN THREE (3) DAYS AND LESS THAN THREE (3) MONTHS	6	
	INTERMEDIATE STATIONARY WORK	3	
	SHORT-TERM STATIONARY, SHORT-DURATION OR MOBILE	0	

FACTOR 2 - WORKER EXPOSURE		POINTS	RATING
CHOOSE ONE CONDITION	WORKERS LOCATED LESS THAN 1.8 METERS (6 FEET) OF ACTIVE TRAFFIC LANES	5	
	WORKERS LOCATED BETWEEN 1.8 AND 4.6 METERS (6 AND 15 FEET) FROM ACTIVE TRAFFIC LANES	3	
	WORKERS LOCATED MORE THAN 4.6 METERS (15 FEET) FROM ACTIVE TRAFFIC LANES	0	

FACTOR 3 - POSTED SPEED LIMIT		POINTS	RATING
CHOOSE ONE CONDITION	POSTED SPEED IS 55 MPH OR GREATER	10	
	POSTED SPEED IS 40 MPH – 50 MPH	6	
	POSTED SPEED IS 30 MPH – 35 MPH	3	
	POSTED SPEED IS 25 MPH OR LESS	0	

FACTOR 4 – WORK ZONE LOCATION		POINTS	RATING
CHOOSE ONE CONDITION	BRIDGE STRUCTURES, DROP-OFFS \geq 0.60 METERS (2 FEET), FILLS OR CUTS > 2:1, OR CONFINED AREAS WITH NO ESCAPE ROUTE FOR WORKERS (NO MEANS OF ESCAPE)	10	
	AREAS WITH BARRIERS OR OBSTACLES THAT HINDER, BUT ALLOW A REASONABLE ESCAPE ROUTE	5	
	AREAS WITH CLEAR AND VIABLE ESCAPE ROUTES TO SAFE ZONES	0	

TOTAL SCORE

POSITIVE PROTECTION EVALUATION FORM

AC NUMBER	MUNICIPALITY	ROAD NUMBER	BEGIN KILOMETER	END KILOMETER
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Based on total point score for the work activity and location determine the action to be taken.

SCORE	REQUIRED ACTION
30 or more	Positive work zone protection devices shall be installed.
20–30	Positive work zone protection devices should be installed where feasible. If positive protection is not installed, mitigation measures shall be implemented to reduce exposure to risk.
Less than 20	Standard temporary traffic control devices may be used.

POSITIVE WORK ZONE PROTECTION DETERMINATION

WORK ZONE NUMBER	ROAD NUMBER	DIRECTION	BEGIN POST MILE	END POST MILE	DURATION (Days)
	LOCATION		WORK ACTIVITY		STAGE/PHASE
TOTAL SCORE	<input type="checkbox"/> Positive work zone protection required <input type="checkbox"/> Positive work zone protection or mitigation measures required <input type="checkbox"/> Standard temporary traffic control devices required				

POSITIVE WORK ZONE PROTECTION

MITIGATION MEASURES CONTINUED

The following positive protection devices will be used on this contract: *(Check all that apply.)*

- Temporary concrete barrier
- Modular plastic barrier (TL-2/TL-3)
- Movable barrier system (concrete/metal)
- Impact attenuators
- Mobile barrier system (MBT-1)
- Other (specify): _____

The following positive protection devices will be used on this contract: *(Check all that apply. A minimum of two measures must be selected.)*

- Full lane closures or detour routes
- Lane reduction with traffic redistribution
- Off-peak or night work
- Phased construction sequencing
- Temporary buffers or shoulders extensions
- Work zone speed limit reduction
- Strategically deployed impact attenuators vehicles (TMA)
- Law enforcement presence or police patrol
- Temporary traffic signals operations
- Enhanced channelizing devices

If positive work zone protection is not implemented for a score between 20 and 30 points, provide technical justification explaining why its use is not feasible:

POSITIVE PROTECTION EVALUATION FORM

GENERAL INFORMATION

- This form document compliances with PRHTA’s technical and regulatory framework for the evaluation and implementation of positive protection in work zones.
- The determination of whether to install positive protection must be based on one or more of the following:
 - Federal and local regulations and specifications
 - Mandatory conditions identified in the Typical Applications Table (Section 5.1)
 - Results of the Positive Protection Evaluation Form (Section 7)
 - Professional engineering judgment, when warranted by site-specific risk factors
- This form must be completed, signed, and archived as part of the project’s official record and integrated into the Transportation Management Plan (TMP).
- For full guidance, refer to the PRHTA Work Zone Positive Protection Guide.

PROJECT INFORMATION (To be completed by the project designer or design consultant)

Please fill out the following general project details to identify the scope and location of the work zone:

- **PROJECT DESIGNER/DESIGN CONSULTANT:** Enter the name of the individual or firm responsible for preparing the design plans.
- **PROJECT MANAGER:** Enter the name of the project manager overseeing the project.
- **DATE:** Enter the date when the form is being completed.
- **PROJECT NAME:** Enter the official name or title of the project.
- **AC NUMBER:** Enter the PRHTA project control number.
- **FEDERAL NUMBER:** Enter the federal project number assigned by FHWA (if applicable).
- **MUNICIPALITY:** Enter the municipality where the project is located.
- **ROAD NUMBER:** Indicate the PRHTA road number or route designation.
- **BEGIN KILOMETER/END KILOMETER:** Enter the starting and ending kilometer marks that define the project limits.

STEP 1 – REQUIRED POSITIVE WORK ZONE PROTECTION

Review the project scope and work zone conditions to determine if positive work zone protection is required based on mandatory criteria outlined in the PRHTA Positive Protection Guide (see Section 5 and Table of Typical Applications).

- If the project includes any condition that mandates the use of positive protection, check the corresponding boxes in the form under “*Project requires work zone positive protection for the following*”.
- An engineering study is not required for mandatory applications. However, the selected positive protection devices must be shown in the project plans, TMP, and relevant technical specifications.
- If none of the mandatory conditions apply, proceed to **Step 2** to evaluate whether positive protection is recommended based on a risk-based engineering analysis.

POSITIVE PROTECTION EVALUATION FORM

STEP 2 – RISK EVALUATION BY WORK ACTIVITY

If none of the mandatory conditions from **STEP1** apply, but one or more conditions listed in the section “Project may require positive work zone protection based on engineering evaluation” are checked, then the risk analysis must be completed for each relevant work zone segment.

Note: If the designer elects to implement positive protection based on engineering judgment, the risk analysis may be omitted. Proceed directly to the *Engineering Judgment / Exceptions* section to document the justification

This evaluation determines whether the use of positive work zone protection is warranted based on project-specific risk factors.

A. Work Zone Identification

Complete the work zone activity section in the form using project-specific information. Include:

- Work Zone Number (as identified in plans or TMP)
- Road Number
- Direction
- Begin and End Kilometer Points
- Municipality
- Stage or Phase (if applicable)
- Work Activity Type (e.g., bridge widening, pipe installation, excavation)
- Duration of the Activity in calendar days
- Location Description (e.g., km 15.3 to km 16.2, median under bridge)

B. Risk Analysis Rating

Using the information from the PRHTA Positive Protection Guide (Section 7), evaluate the following four risk factors for each work zone activity. For each factor, select the condition that best describes the site and enter the corresponding score in the form:

- **Factor 1 – Duration of Activity:** Longer duration increases risk and may warrant positive protection.
Work duration definitions:
 - a. *Intermediate stationary work:* Occupies a location for more than one (1) day up to three (3) consecutive days, or nighttime work lasting over an hour.
 - b. *Short-term stationary:* Occupies a location for more than one (1) hour during a single daytime period.
 - c. *Short-duration or mobile work:* Occupies a location for one (1) hour or less, typically for mobile or quick maintenance operations.
- **Factor 2 – Worker Exposure:** Proximity to traffic lane determines risk severity.
- **Factor 3 – Posted Speed Limit:** Use pre-construction speed limit, not reduced work zone limits.
- **Factor 4 – Work Zone Location:** Physical characteristics that impact escape routes or exposure.

Refer to the risk factor tables embedded in the form for point values associated with each condition.

C. Calculate the Total Risk Score

After rating all four factors:

- Sum the point values to obtain a Total Score.
- Enter the score in the designated field at the bottom of the section.

POSITIVE PROTECTION EVALUATION FORM

STEP 3 – SCORING AND DETERMINATION

Once all four risk factors in **Step 2** have been evaluated and scored, the total score should be calculated and recorded. This total score determines the required level of protection for each work zone activity, based on PRHTA's risk-based decision framework.

A. Scoring and Required Action

Total Score	Required Action
30 points or more	Positive work zone protection devices shall be installed.
20–30 points	Positive work zone protection devices should be installed where feasible. If positive protection is not installed, mitigation measures shall be implemented to reduce exposure to risk.
Less than 20 points	Standard temporary traffic control (TTC) devices may be used.

B. Completing the Form

In the “Determination” section of the form:

- Check the box that reflects the outcome based on the score.
- Ensure the total score and relevant project/work zone information are recorded.

STEP 4 – SELECTION OF POSITIVE PROTECTION DEVICES OR MITIGATION MEASURES

Once the total risk score has been calculated and the appropriate action level determined, the next step is to select and document the specific protective devices or mitigation strategies that will be implemented.

A. If Positive Work Zone Protection is Required or Recommended

If the score is 30 or higher, or 20–30 and feasible:

- Select the specific positive protection device(s) to be installed, based on work zone conditions, duration, space constraints, and project phasing.
- Reference applicable device types listed in Section 3 and Table 5.1 / 5.2 of the Guide.

B. If Mitigation Measures are Selected Instead of Positive Protection

If the use of positive protection is not feasible due to spatial, operational, or constructability limitations (even when score ≥ 20), the decision must be justified in the form and approved by PRHTA.

Select the mitigation measures that will be implemented, based on conditions and best practices outlined in Section 6 of the Guide.

C. If Standard TTC is Deemed Sufficient

For scores < 20 , no further justification is required. Proceed with documenting standard TTC setup in the TMP and plans.

POSITIVE PROTECTION EVALUATION FORM

STEP 5 – EXCEPTIONS OR ENGINEERING JUDGMENT

This section must be completed in either of the following situations:

- **When the score is below 30 points and positive protection is still proposed:**
If professional engineering judgment determines that positive work zone protection is necessary, even though the risk score does not mandate it, provide a justification explaining the specific conditions or risks that warrant its use, and identify the type of device(s) to be implemented.
- **When the score is 30 points or more and positive protection is not installed:**
If a required positive protection device cannot be feasibly installed due to physical, operational, or environmental constraints, document the technical justification for this exception. Include any alternative mitigation measures implemented to reduce risk, and ensure the exception is approved by PRHTA.

All exceptions must be thoroughly documented in the designated section of the form and signed by the responsible project engineer.

STEP 6 – SIGNATURE AND FILING

The Positive Work Zone Protection Evaluation Form must be signed and sealed by the Project Designer (or the Design Consultant responsible for the project). This signature certifies that the evaluation has been completed in accordance with PRHTA policy and the applicable federal guidelines.

For federally funded projects or those under PRHTA jurisdiction, the following must be included:

- **Professional Engineer's Seal:** Include the printed name, professional registration number, and license expiration date of the engineer responsible for preparing the determination.
- **Signature and Printed Name:** The Project Designer (or Project Sponsor, if applicable) must sign and print their name.
- **Date:** Indicate the date of signature.

Any changes made during construction that affect the work zone protection plan must be documented using a revised version of this form, signed and sealed by the Resident Engineer or the Designer, and filed with the project's Transportation Management Plan (TMP) documentation.