Washington State Department of Transportation

Memorandum

October 7, 2025

TO: WSDOT Project Development Engineers

FROM: Mark Gaines, Development Division Director, State Design Engineer

SUBJECT: **AMENDED** Project Delivery Memo #23-06 - Pre-NCHRP 350 Guardrail Terminal Replacement

Purpose

The purpose of this Project Delivery Memo is to provide policy and instruction for the evaluation and replacement of pre-NCHRP 350 terminals (such as Breakaway Cable Terminals, or BCTs) on Washington Department of Transportation (WSDOT) projects.

Background

The FHWA issued a series of memorandums over a period of several years beginning in 1994 which recommended the replacement of pre-NCHRP 350 guardrail terminals on the National Highway System. In response to the memorandums, WSDOT began removing pre-NCHRP 350 terminals (specifically BCTs) in basic safety and other regional projects. In the 2017-2019 biennium, the HQ Development Division and HQ Capital Program Management offices established an I-2 sub-~~program~~category for BCT Replacement projects. This sub-~~program~~category was established to systematically replace BCTs on Washington State highways with a focus on interstate and non-interstate freeways. With the impending completion of this sub-~~program~~category, WSDOT is beginning the next phase for the systematic removal of pre-NCHRP 350 terminals from the state highway system as outlined in this project delivery memorandum.

Direction

Improvement Projects: Remove and replace all existing pre-NCHRP 350 terminals located within project limits and installed inside the Design Clear Zone with MASH compliant terminals[1] for all WSDOT improvement ~~or preservation~~ projects beginning design[2] on or after December 1st, 2023, regardless of project or highway type unless otherwise exempted from removal per the guidance below.

Preservation Projects: Alongside mainline interstate and freeways, remove and replace all existing pre-NCHRP 350 terminals located within project limits and installed inside the Design Clear Zone with MASH compliant terminals[1] for all WSDOT preservation projects on or after the date of amended Project Delivery Memo #23-06 unless otherwise exempted from replacement per the guidance below. Discuss options with your ASDE if adopting this direction affects the anticipated advertisement date of a project.

Exemptions: Existing pre-NCHRP 350 terminals that fit the above description are exempted from replacement and may remain in place if they are undamaged and are:

1) Shielded by another barrier (both improvement and preservation projects);
2) Located alongside roadways with posted speed limits 30 mph or less (both improvement and preservation projects);
3) Located alongside onramp areas extending from the crossroad's edge of traveled way to 70-feet up the onramp (see Exhibit 1 below) (improvement projects only);
4) Located alongside offramp areas extending from the edge of the traveled way of the crossroad to 160-feet up the offramp (see Exhibit 1 below) (improvement projects only);
5) Located alongside any non-mainline section of roadway (i.e. ramp areas, under crossings, over crossings, etc.) (preservation projects only);
6) Located on the trailing end of guardrail runs on one-way roadways (both improvement and preservation projects); or
7) Located on the trailing end of guardrail runs for adjacent traffic and placed outside the Design Clear Zone for opposite traffic on two-way roadways (both improvement and preservation projects).

In addition, the Assistant State Design Engineer (ASDE) can exempt a pre-NCHRP 350 terminal from replacement if it will be replaced in another funded and programmed project.

When removing and replacing a pre-NCHRP 350 terminal, apply the following guidance:

[1] MASH compliant terminals are defined as those that indicate MASH compliancy in the terminal's Qualified Product List (QPL) description or have been approved as such by HQ Design as part of a WSDOT Request for Approval of Materials (RAM) process.

[2] Design starts at the approval of the project summary documents (i.e., Project Profile, Basis of Design and Environmental Review Summary) or as directed by CPDM.

- **Inventory:** Contact your ASDE for the latest inventory listing of pre-NCHRP 350 terminals found within the project limits. Please note that the provided inventory list may be incomplete or out-of-date. Perform a field verification of all terminals found within the project limits to visually identify any pre-NCHRP 350 terminals regardless if pre NCHRP 350 terminals are shown in the inventory or not. Per the HQ Design inventory instructions, project offices are directed to update the inventory list and return a copy to their ASDE showing all pre-NCHRP 350 terminals located within project limits, and how the pre-NCHRP 350 terminals have been addressed on the project (i.e., replacement, exemption, and reason for exemption).
- **Field identification:** Although most of the pre-NCHRP 350 terminals in service are BCTs, other types may exist in the field. Use the guardrail terminal identification guide for information about identifying existing terminals. See the Roadside Safety questions and answers document or contact your ASDE with questions about identifying terminals.
- **Transition sections:** If impacted, replace pre-NCHRP 350 transition sections with currently approved transition sections.
- **Length of Need:** Follow the length of need criteria shown in Design Manual 1610.03(8) for the terminal replacements.
- **Guardrail Height:** If a terminal replacement installation connects to an existing guardrail run that does not meet the height criteria shown in Design Manual Section 1610.04(3), then raise (by field drilling existing posts) or remove and reset a short section of the guardrail run (25-feet is suggested) to a height of 28-inches and attach a Type 1 to Type 31 adaptor (Std. Plan C-25.80). It is permissible to raise or replace the entire guardrail run if engineering judgement indicates that it is prudent (due to guardrail run length) to do so.
- **Bridge Rails:** If impacted, contact HQ Bridge to determine if it is in the scope of the project to replace/modify bridge rails.
- **Terrain:** Follow the grading criteria shown on the non-flared terminal standard plans (Standard Plans C-22.40 or C-22.45).
- **Curbs within Terminal Limits:** Remove curbs if hydraulically acceptable.

Questions

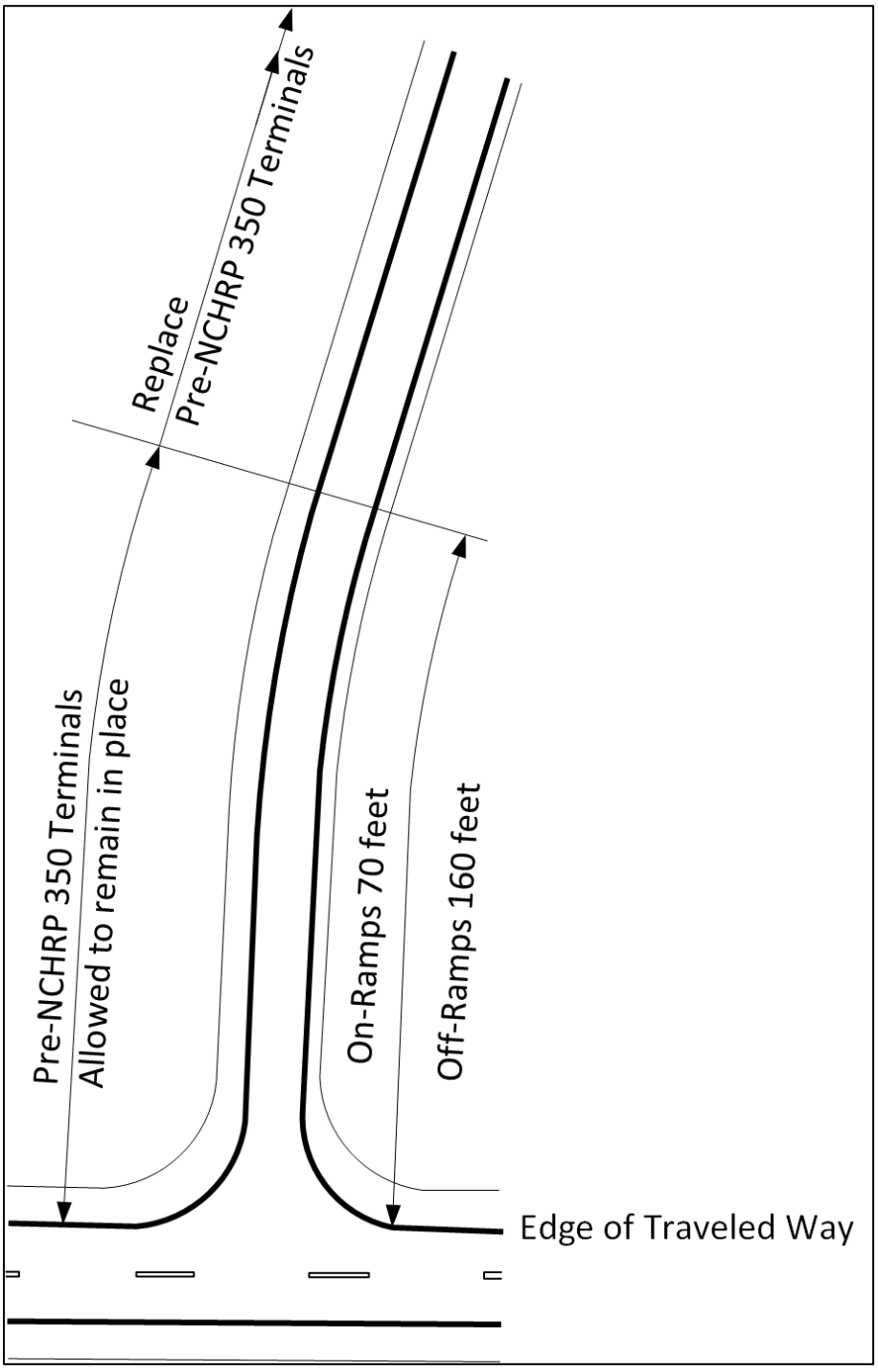
Contact your ASDE for questions or information on how to implement this Project Delivery Memo.

MG:tjm

cc: Regional Administrators
Assistant State Design Engineers

Omar Jepperson - SR 520 and AWV Program Administrator
Frank Green - IBR WA Assistant Program Administrator
John H White - Puget Sound Gateway Program Administrator
Lisa Hodgson - I-405/SR 167 Program Administrator
Tim Rydholm - Deputy Director, Capital Program Development & Management Division

Exhibit 1: Pre-NCHRP 350 Guardrail Terminal Ramp Removal Areas


Replace
Pre-NCHRP 350 Terminals
Pre-NCHRP 350 Terminals
Allowed to remain in place
On-Ramps 70 feet
Off-Ramps 160 feet
Edge of Traveled Way