Highway Project Types for Shoulder Use and Noise Studies

Recent interest in finding new ways to reduce congestion on our state highways without widening the existing facility and minimizing costs and impacts to the environment through the Practical Design Practical Solutions (PDPS) process has resulted in several possible scenarios for vehicle use of highway shoulders. The proposed scenarios have also raised the question about whether a noise study would be required for these types of projects.

This document follows FHWA 2016 guidance on *Use of Freeway Shoulders for Travel*[1] and provides guidance on when noise studies are needed for specific WSDOT project scenarios (Type 1 projects) and when they are not needed (Type 3 projects). Some projects may not be as clearly defined as to whether they would be a Type 1 or Type 3 project and so must be evaluated on a project by project basis.

Project Types

Per 23 CFR 772 a noise analysis is required for all Federal or Federal-aid Highway projects categorized as a Type 1 project. Type 1 projects include those that add a travel lane. The FHWA guidance addresses part-time shoulder use and describes three types of part-time shoulder use projects which will accommodate all possible known scenarios, and whether a noise study would be required. Examples of these scenarios are depicted in illustrations attached to this document.

- Transit bus-only use of shoulders (Bus on Shoulder, or BOS) to improve transit bus travel time. This type of project may only need to analyze noise qualitatively because the additional vehicles and changes in speed are small and/or insignificant. (see SCENARIO 1)
- Static shoulder use for most vehicles during predetermined hours of operation and open to all vehicles except heavy trucks[2]. A noise analysis will be conducted in a manner similar to a conventional Type 1 project (e.g., widening) if the static shoulder use is on an outside shoulder and potentially moving traffic closer to sensitive noise receptors. If it is on an inside shoulder it is unlikely to have any effect on the noise environment and so would be considered a Type 3 project and a noise study will not be required. (see SCENARIO 2)
- Dynamic shoulder use for most vehicles based on need and real-time traffic conditions and open to all vehicles except heavy trucks. Noise analysis will be conducted in a manner similar to a conventional Type 1 project (e.g., widening). If posted speeds during dynamic shoulder use are reduced to 35 mph or lower it would be considered a Type 3 project and a noise study will not be required since it is unlikely to have any effect on the noise environment. (see SCENARIO 3)

A possible fourth type of project (24-hour Bus Access Transit (BAT) Lane) which are usually only on arterial streets and are typically added as a new lane on the outside of the street is considered a Type 1 project and will require a noise study because the project will be creating a new through lane. (see SCENARIO 4)

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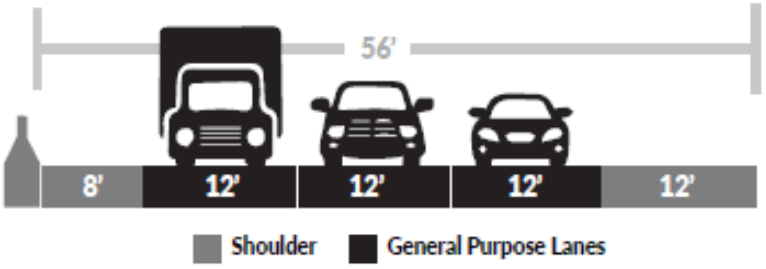
[1] *Use of Freeway Shoulders for Travel – Guide for Planning, Evaluating, and Designing Part-Time Shoulder Use as a Traffic Management Strategy*, Report No. FHWA-HOP-15-023, Federal Highway Administration, January 2016

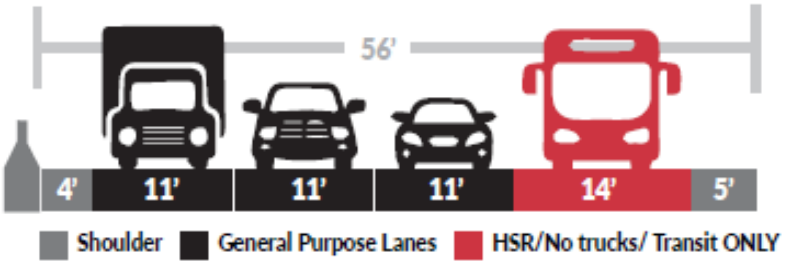
[2] Heavy trucks are defined simply as vehicles with three or more axels. More refined categories of heavy truck classification can be found in FHWA 2014, *Verification, Refinement, and Applicability of Long-Term Pavement Performance Vehicle Classification Rules*, FHWA-HRT-13-091.

EXAMPLE SCENARIO 1
BUS ON SHOULDER*

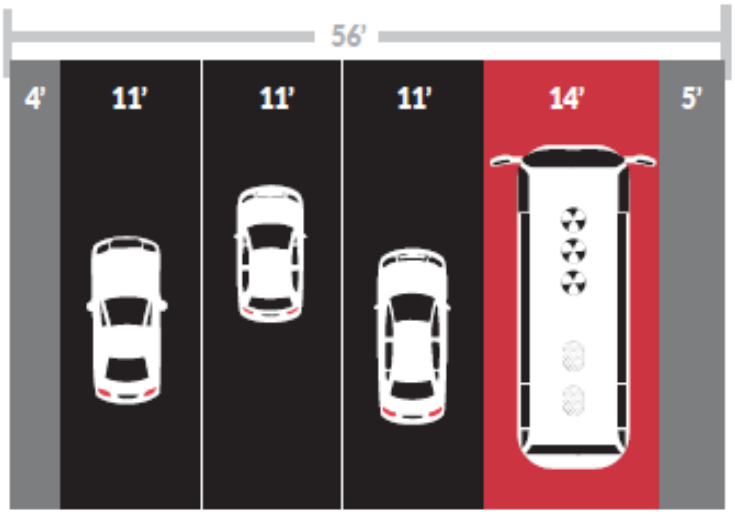
TYPICAL BEFORE



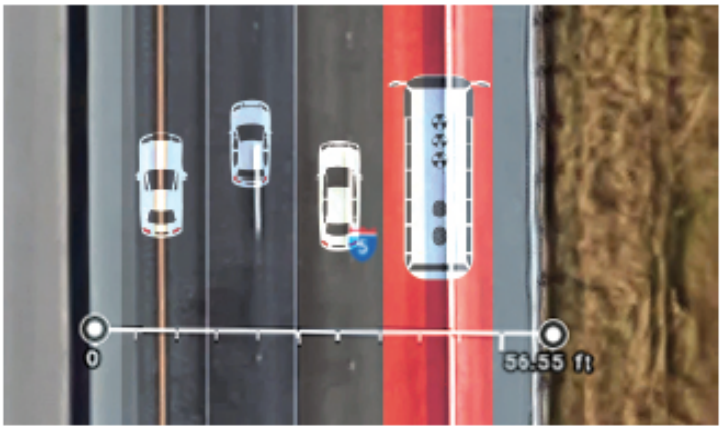
AFTER



PLAN VIEW



AERIAL VIEW

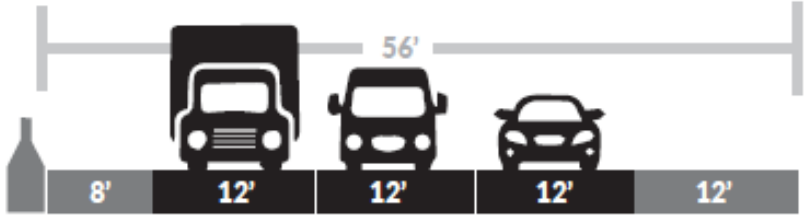


* **Note:**
Scenarios are Outside shoulder Examples. Inside shoulder scenarios are reversed from these diagrams

EXAMPLE SCENARIO 2

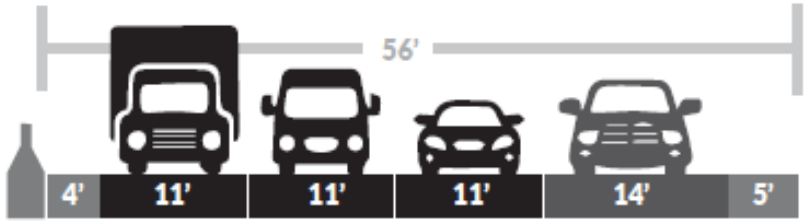
GENERAL PURPOSE TRAFFIC ON SHOULDER*

TYPICAL BEFORE



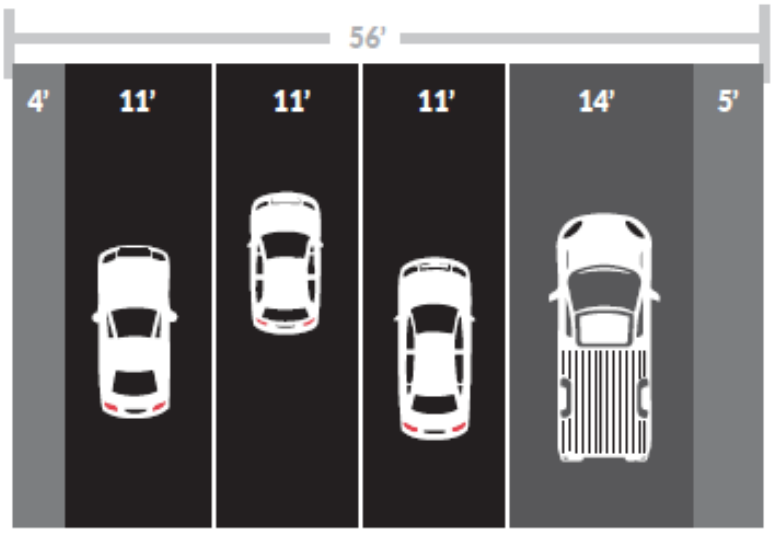
Shoulder General Purpose Lanes

AFTER



Shoulder General Purpose Lanes Reconfigured General Purpose Lane/ NO TRUCKS

PLAN VIEW

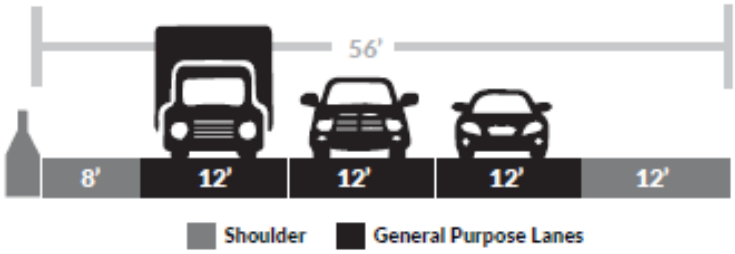


Shoulder General Purpose Lanes Reconfigured General Purpose Lane / NO TRUCKS

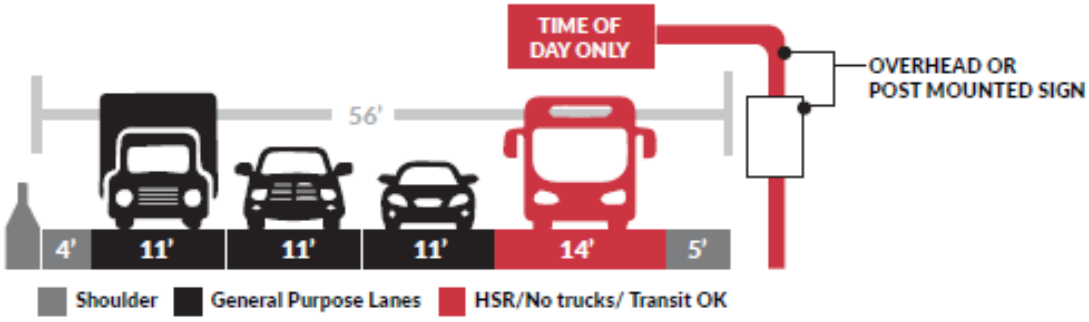
* **Note:**
Scenarios are Outside shoulder Examples. Inside shoulder scenarios are reversed from these diagrams

EXAMPLE SCENARIO 3
DYNAMIC SHOULDER* USE

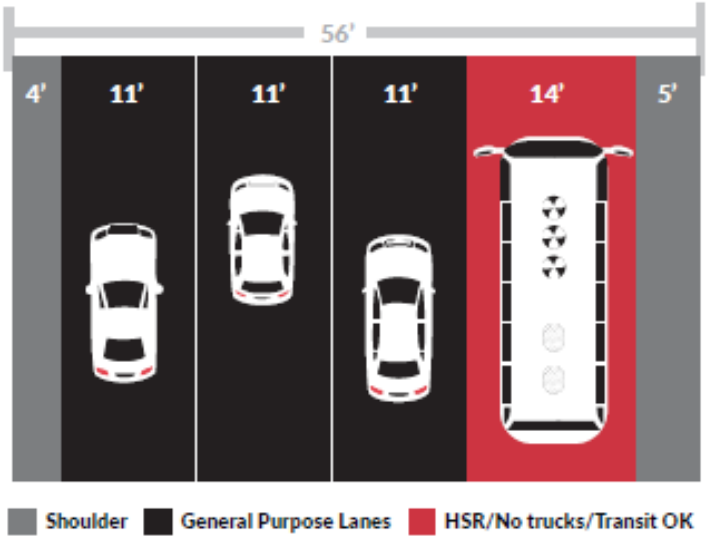
TYPICAL BEFORE



AFTER



PLAN VIEW



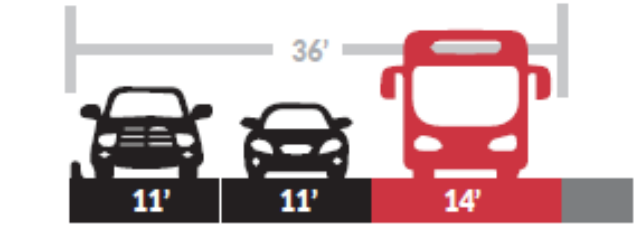
DRIVER PERSPECTIVE

*** Note:**
Scenarios are Outside shoulder Examples. Inside shoulder scenarios are reversed from these diagrams

EXAMPLE SCENARIO 4

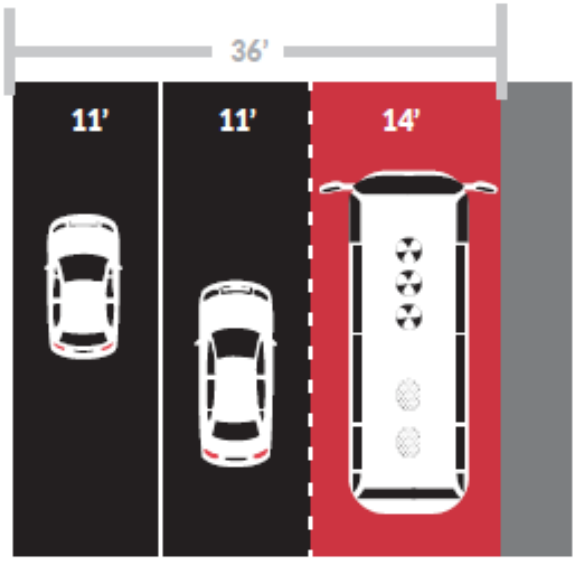
BUS ACCESS TRANSIT - ARTERIALS

NEW LANE ADDED



Shoulder | General Purpose Lanes | HOV/ Transit only

PLAN VIEW



Shoulder | General Purpose Lanes | HOV/ Transit only

AERIAL VIEW