

2018 AASHTO NOISE WORKING GROUP SUMMIT

Part time shoulder use

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June 27-28, 2018



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FHWA Part Time Shoulder Use Guidance

Noise Analysis

The level of highway noise primarily depends upon traffic volume, traffic speed, truck volume, and to a lesser extent it depends on other factors such as topography and pavement type.

The Federal noise regulation in 23 CFR 772 constitutes the Federal noise standard. For the purposes of meeting the requirements in 23 CFR 772, a noise analysis is required for all Federal or Federal-aid projects that are defined as Type I, per the regulation. Noise measurements are conducted to determine existing noise levels, and future levels are predicted using the FHWA Traffic Noise Model (TNM). A noise impact occurs when the predicted noise level approaches or exceeds the Noise Abatement Criteria (NAC) in 23 CFR 772, Table 1, or represents a substantial increase over existing noise levels. If noise impacts are determined, then noise abatement must be considered. If noise abatement is found to be feasible and reasonable, per 23 CFR 772 and that state's noise policy, then the noise abatement measure must be constructed. For the purposes of NEPA, a noise analysis may also compare the project noise level of a no-build or no action condition to the existing noise levels.

There are eight parts to the Type I definition, but there are only three that may encompass a part-time shoulder use project, depending on the type of shoulder and any restrictions and/or requirement for its uses. Those three parts include:

"The physical alteration of an existing highway where there is...substantial horizontal alteration. A project that halves the distance between the traffic noise source and the closest receptor between the existing condition and the future build condition."

"The addition of a through-traffic lane(s). This includes the addition of a through-traffic lane that functions as an high-occupancy vehicle (HOV) lane, High-Occupancy Toll (HOT) lane, bus lane, or truck climbing lane."

"Restriping the existing pavement for the purpose of adding a through-traffic lane or an auxiliary lane."

Similar to air quality analysis, design exceptions required for part-time shoulder use projects will make these projects federal and, thus, subject to 23 CFR 772.

The level of noise analysis necessary will depend upon the type of part-time shoulder use. For bus-on-shoulder (BOS), noise analysis may be qualitative because the number of additional vehicles and changes in speed are small or nonexistent. For static and dynamic part-time shoulder use, noise analysis will typically be conducted in a manner similar to a conventional widening project. For the noise analysis, the location of the part-time shoulder use would affect the proximity to sensitive receptors. Left side part-time shoulder use is less likely to have noise impacts compared to right side part-time shoulder use, which places the traffic closer to sensitive receptors. Noise analysis and determination of noise mitigation needs is focused on peak noise conditions. This may or may not correspond to peak volume conditions (when shoulder lanes are typically open), and analysis will determine if part-time shoulder use affect peak noise or not. Predicted noise levels are determined by using the FHWA Traffic Noise Model.⁽⁴⁾ If part-time shoulder use does increase peak noise, and there are impacts associated with it, then noise abatement must be considered and implemented if found to be feasible and reasonable.

Existing part-time shoulder use demonstrates the differences in noise analysis and mitigation needs. For example, part-time shoulder use on US 2 in Everett, Washington, was implemented on a bridge over wetlands. There were no sensitive receptors (i.e. land uses where noise would cause impacts) in the project area, so no noise analysis was conducted. Washington State is currently planning part-time shoulder use on another freeway—I-90 east of Seattle—and noise analysis was conducted because there were sensitive receptors. The analysis indicated the need for noise walls, which will be constructed as part of the part-time shoulder use project.⁽³³⁾

<https://ops.fhwa.dot.gov/publications/fhwahop15023/ch5.htm#s53>



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