

Noise Level (A-weighted)	The sound pressure level obtained through use of A-weighting characteristics. The unit of measure is the decibel (dB), commonly referred to as dBA when A-weighting is used.
Acoustics	The branch of physics dealing with sound and sound waves.
Ambient Noise	All-encompassing noise associated with a given environment; usually a composite of sounds from many sources, near and far.
Attenuation	Any decrease in sound level; can be caused by increased distance, diffraction around a barrier, etc.
Cost effectiveness criteria	Limits used to determine when a noise barrier is economical in terms of tangible benefits produced by money spent.
Daytime	The hours from 7 a.m. to 10 p.m.
Decibel (db)	A measure used to express the relative level of a sound in comparison with a standard reference level. The higher the sound level in decibels, the more intense or loud the sound.
Design Year	The future year used to estimate the probable traffic volume for which a highway is designed, typically 20 years from date of project opening.
Diffraction	The bending of sound waves around an obstacle, such as a barrier. The process reduces the effectiveness of the shadow zone. (See also Shadow Zone)
Existing Noise Level	The worst noise hour resulting from the combination of natural and mechanical sources and human activity usually present in a particular area.
Freeway or expressway	A divided, controlled-access highway with four or more lanes.
Frequency	The rate of vibration expressed in number of cycles per second (hertz or Hz). Frequency corresponds roughly to pitch in the human perception of sound
L10	The sound level that is exceeded 10 percent of the time (the 90th percentile) for the period under consideration. L10(h) is the hourly value of L10.
Leq	The equivalent steady-state sound level which in a stated period of time contains the same acoustic energy as the time-varying sound level during the same time period, with Leq(h) being the hourly value of Leq.

Nighttime	The hours from 10:00 p.m. to 7:00 a.m.
Noise	Undesirable or unwanted sound; as defined by Minnesota Pollution Control Agency Regulations (NPC-1), "any sound not occurring in the natural environment, including but not limited to sounds emanating from aircraft and highways, and industrial, commercial and residential sources."
Noise Barrier	A physical obstruction that is constructed between the highway noise source and the noise sensitive receptor(s) that lowers the noise level, including standalone noise walls, noise berms (earth or other material), and combination berm/wall systems.
Shadow Zone	As it relates to barriers, an area of decreased sound energy governed principally by the properties of diffraction and transmission loss.
Substantial Noise Increase Substantial Change	One of two types of highway traffic noise impacts. For a Type I project, an increase in noise levels of at least 5 dBA in the design year over the existing noise level. A substantial increase or decrease in noise level is a change of 5 dBA or more.
Tire/Pavement Noise	The noise produced by the interaction between the rolling tires of a vehicle and the pavement, and separate from other sources (engine, exhaust, etc.)
Traffic Noise Impacts	Design year build condition noise levels that approach or exceed the FHWA NAC listed in Table 1 (Section 4.1), or exceed State Noise Standards listed in Table 2 (Section 4.1) for the design year build condition; or design year build condition noise levels that create a substantial noise increase over existing noise levels.
Type I Projects	<p>A proposed Federal or Federal-aid highway project for the construction of a highway meeting one or more of the following conditions.</p> <p>(1) The construction of a highway on new location; or,</p> <p>(2) The physical alteration of an existing highway where there is either:</p> <ul style="list-style-type: none"> <li>(i) Substantial Horizontal Alteration. A project that halves the distance between the traffic noise source and the closest receptor between the existing condition to the future build condition; or,</li> <li>(ii) Substantial Vertical Alteration. A project that removes shielding, therefore exposing the line-of-sight between the</li> </ul>

receptor and the traffic noise source. This is done by either altering the vertical alignment of the highway or by altering the topography (not including the addition or removal of vegetation) between the highway traffic noise source and the receptor; or,

- (3) Bridge replacement projects that satisfy item (2), above.
- (4) The addition of a through-traffic lane(s). This includes the addition of
  - a through-traffic lane that functions as a HOV lane, contraflow lane,
  - High-Occupancy Toll (HOT) lane, bus lane, or truck climbing lane;
  - or,
- (5) The addition of an auxiliary lane, except for when the auxiliary lane is a turn lane.
- (6) The addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange; or,
- (7) Restriping existing pavement for the purpose of adding a through-traffic lane or an auxiliary lane; or,
- (8) The addition of a new or substantial alteration of a weigh station, rest stop, ride-share lot or toll plaza.
- (9) If a project is determined to be a Type I project as defined above, then the entire project area as defined in the environmental document is a Type I project.

Type II Projects

A Federal or Federal-aid highway project for noise abatement on an existing highway; often referred to as retrofit projects. Eligibility requires the development of a priority ranking system to allow for consistent and uniform application of a Type II Program State-wide.

Type III Projects

A Federal or Federal-aid highway project that does not meet the classifications of a Type I or Type II project. Type III projects does not require a noise analysis.