II. Definitions/Acronyms

**Attenuation** - The reduction of an acoustic signal (noise).

**Average Daily Traffic (ADT)** - The total traffic volume during a given period divided by the number of days in that period. Current ADT volumes can be determined by continuous traffic counts or periodic counts.

**A-Weighted levels** - Adjustment or weighting of sound frequencies to approximate the way that the average person hears sounds. This weighting system assigns a weight that is related to how sensitive the human ear is to each sound frequency. Frequencies that are less sensitive to the human ear are weighted less than those for which the ear is more sensitive.

**Barrier** - A natural or man-made object that interrupts the path of sound from the sound source to the sound receptor.

**BDM** - Bridge Design Manual

**Benefited Receptor** - A receptor predicted to receive a reduction of at least 5 dB(A) LEQ(H) from the proposed mitigation and inclusive of all such residences, not limited to those receptors in the first row.

**BOWE** - Bottom of wall elevation

**BOWP** - Bottom of wall profile

**Build Condition** - The proposed roadway configuration in the design year.

**Clear Zone** - The unobstructed, relatively flat area provided beyond the edge of the traveled way for recovery of errant vehicles. The travel way is the portion of the roadway not including shoulders. It is desirable to provide a roadside clear of hazardous objects or conditions for a distance consistent with speed, traffic volume and geometric conditions of the site.

**Composite Materials** - A composite material noise barrier is constructed with distinct components. An example composite noise wall has a hollow fiberglass shell and is filled with recycled tires.

**CPBC** - Cost per benefited receptor

**Decibel (dB)** - A measure used to express the relative level of a sound in comparison with a standard reference level.
\textit{dB(A)} - The noise levels in decibels measured with a frequency weighting network, corresponding to the “A-Scale” on a standard sound level meter.

\textit{Design year} - The future year for which traffic projections are made in establishing the design for a specific project as defined in the LDM, Vol. I, Section 102.2. The Design Year is typically 20 years out and correlates to the plan scope and certified traffic.

\textit{DYB} - Design year build

\textit{DYNB} - Design year no build

\textit{EOBS} - Edge of backslope

\textit{EOFS} - Edge of foreslope

\textit{EOP} - Edge of pavement

\textit{EOS} - Edge of shoulder

\textit{ERC} - Equivalent Receptor Calculation

\textit{Existing noise levels} - The surrounding noise of an area. Measured in dB(A), it provides a reference base for determining noise impacts when transportation improvements or new transportation facilities are being considered. When calculated, it is based upon noise levels experienced during the period of greatest highway traffic noise. Note that this period can occur at other times than normal peak hour. It is the worst noise hour resulting from the combination of natural and mechanical sources and human activity usually present in a particular area.

\textit{Equivalent Sound Level (Leq)} - The equivalent steady-state sound level which in a stated period of time contains the acoustic energy as the time-varying sound level during the same time period.

\textit{Feasible} - A mitigation measure that is acoustically feasible and meets engineering requirements for constructability. A feasible noise barrier must provide a minimum 5 dB(A) reduction for 40% of the impacted receptors.

\textit{Front Row Receptors} – Noise sensitive locations immediately adjacent to the roadway (typically within 100’-150’ of the roadway).

\textit{FHEU} - Frequent Human Exterior Use

\textit{FHWA} - Federal Highway Administration.

**Heavy trucks** - Any vehicle having three or more axles and designed for the transportation of cargo.

**Hertz** - The unit of frequency; one Hertz has a periodic interval of one second.

**Impacted Receptor** – A noise receptor predicted to experience noise levels at or above the activity category’s FHWA NAC in the Noise Analysis process using the FHWA TNM 2.5 computer program.

**Insertion Loss (IL)** – The decrease in noise level the noise barrier is providing.

**Ldn (Day/Night average sound level)** - Average sound exposure over a 24-hour period is often presented as a day-night average sound level (Ldn). Ldn values are calculated from hourly Leq values, with the Leq values for the nighttime period (10:00 p.m.7:00 a.m.) increased by 10 dB to reflect the greater disturbance potential from nighttime noises.

**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 period

**Leq (h)** - The hourly value of Leq (based upon the peak-hour percentage of the annual average daily traffic).

**L10(H)** - The A-weighted noise level that is exceeded 10% of the time. Thus the L10 level is an indication of the peak levels of the intruding noise.

**Lmax** - The maximum sound level measured over a time period.

**Medium trucks** - All vehicles having two axles and six wheels designed for the transportation of cargo.

**NBCR**: Noise Barrier Condition Rating

**NBS**: Noise Barrier Specification.

**NMP**: Noise Measurement Plan

**No Build Condition** - Modeling design year traffic volumes using the existing roadway configuration.

**Noise** - Sound that is unwanted or undesirable.
Noise Abatement - Measures taken to mitigate or reduce traffic noise impacts (i.e. construction of berms or noise walls, shifting roadway alignment etc.).

Noise Abatement Criteria (NAC) - The absolute value used to determine noise impacts at the various land use activity categories. Refer to Table 1, reference 23 CFR 772.

Noise Barrier Design Table (NBDT)- A table/spreadsheet which includes information such as top of wall elevations, bottom of wall elevations, distance offset from roadway centerline, barrier heights, and wall stationing every 50' or less.

Noise Reduction Design Goal - The optimum desired dB(A) noise reduction determined from calculating the difference between future build noise levels with abatement, to future build noise levels without abatement. The ODOT design goal is a 7 dB(A) reduction for at least one benefited receptor.

Noise Sensitive Area (NSA) – An area containing multiple noise sensitive receptors in close proximity (FHWA Activity Categories A-E).

NPI- Noise Public Involvement

NPIS- Noise Public Involvement Summary report.

NRC- Noise Reduction Coefficient

NWPPP- Noise Wall Preliminary Placement Plan

Parallel Walls - Two walls constructed on the opposite sides of a highway.

Peak hourly traffic - The highest hourly traffic volume of the day.

Point source - One single source (i.e. one vehicle).

Protected Receptor - A receptor or other eligible land use expected to receive a reduction of 5 dB(A) (Leq)(h) or more, from the proposed mitigation, normally those in the first row or closest to the roadway.

Reasonableness - The combination of social, economic, and environmental factors considered in the evaluation of a noise abatement measure.

Receptor - An individual or site location registering measurable sound levels, as described in 23 CFR 772.

SAM- Sound Absorptive Material- A material absorbing sound energy when sound waves collide with it, as opposed to reflecting the energy
**Soft site** - Soft ground conditions, such as grass, that tends to absorb noise.

**STC** - Sound Transmission Class- A single figure rating for comparing the effectiveness of walls in resisting the transmission of airborne sound.

**Substantial Impact** - If the predicted noise levels exceed the existing noise levels by 10 dB(A) or more, this is considered a substantial impact.

**Substantial Reduction** - A noise decrease of at least 5 dB(A).

**TL** - Transmission Loss

**TNM (Traffic Noise Model)** - The FHWA TNM is the official noise model for use on ODOT projects.

**TOWE** - Top of wall elevation

**TOWP** - Top of wall profile

**Traffic noise impacts** - Impacts which occur when the predicted traffic noise levels approach or exceed the NAC (i.e. within one dB(A)) or when the predicted noise levels substantially exceed the existing noise levels defined as 10 dB(A) or more.

**Transportation-related noise** - Noise generated by the engine, tires, exhaust, etc. of vehicles using the transportation system.

**Type I project** - A Type I project is a proposed Federal or Federal-aid highway project for the (1) Construction of a highway on new location; or, (2) The physical alteration of an existing highway where there is either: (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, (ii) Substantial Vertical Alteration. A project that removes shielding therefore exposing the line-of-sight between the receptor and the traffic noise source. This is done by either altering the vertical alignment of the highway or by altering the topography between the highway traffic noise source and the receptor; or, (3) The addition of a through-traffic lane(s). This includes the addition of a through-traffic lane that functions as a HOV lane, High-Occupancy Toll (HOT) lane, bus lane, or truck climbing lane; or, (4) The addition of an auxiliary lane, except for when the auxiliary lane is a turn lane; or, (5) The addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange; or, (6) Restriping existing pavement for the purpose of adding a through-traffic lane or an auxiliary lane; or, (7) The addition of a new or substantial alteration of a weigh station, rest stop, ride-share lot or toll plaza. (8) If a project is determined to be a Type I project per § 772.5 then the entire project area as defined in the environmental document is a Type I project.

**Type II project** - A Federal, Federal aid or State funded project proposed to provide acoustic protection for receptors that were in existence prior to the construction of the roadway. This
program is voluntary for state participation and is more fully described in Section III, Type II Projects.

*VPH*- Vehicles Per Hour