

# NOISE BARRIER WALL FACT SHEET

## What is noise? How is it measured?

Noise is defined as unwanted sound and can come from both man-made and natural sources. Sound levels are measured in decibels (dB) and typically range from 40 to 100 dB. As a rough guide:

- A 3 dB increase can barely be detected
- A 5 dB increase is clearly detectable
- A 10 dB increase is twice as loud as the starting noise level

Human hearing is limited in its detection of very high and low frequencies. As a result, "A-weighting" is commonly applied to sound levels to better characterize its effects on humans. A-weighted sound levels are expressed as dB(A). The chart on this page shows typical noise levels emitted from some common sources.

Because sustained noise levels (such as those from a nearby highway) interfere with our daily activities to a greater extent than short, louder noises (such as a single car horn), traffic noise analyses typically consider average noise levels over a one-hour period.

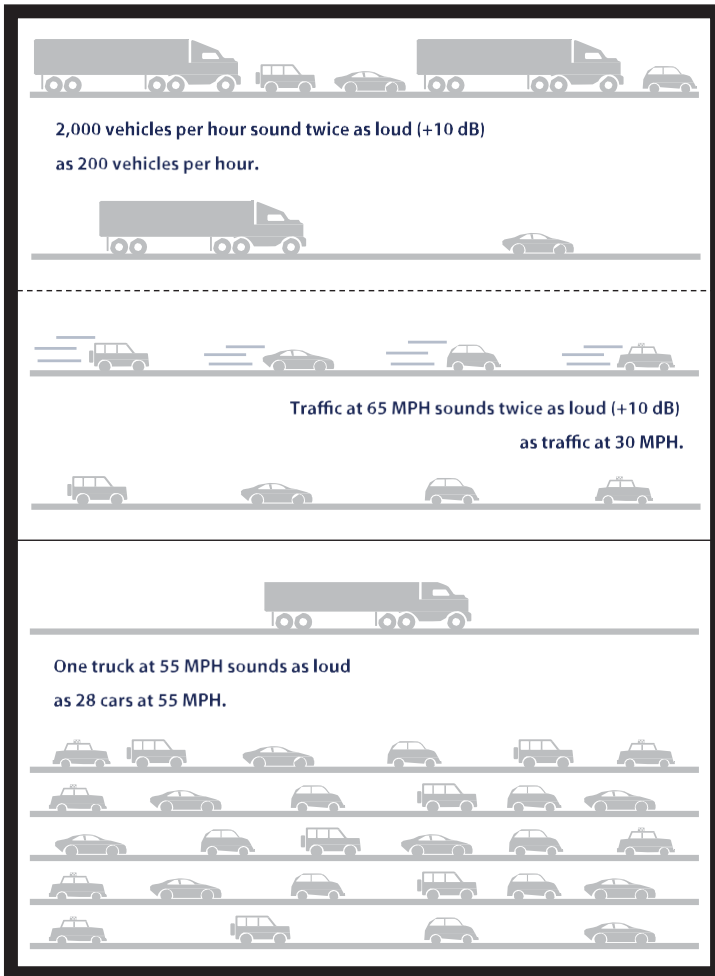
Common Outdoor and Indoor Noises			
Outdoor Noises	Sound Pressures (uPa)	Sound Pressure Levels (dB)	Indoor Noises
Jet Flyover at 300 m	6,324,555	110	Rock Band at 5 m
Gas Lawn Mower at 1 m	2,000,000	100	Inside Subway Train (New York)
Diesel Truck at 15	632,456	90	Food Blender at 1 m
Noisy Urban Daytime	200,000	80	Garbage Disposal at 1 m Shouting at 1 m
Gas Lawn Mower at 30 m	63,246	70	Vacuum Cleaner at 3 m Normal Speech at 1 m
Commercial Area	20,000	60	Large Business Office
Quiet Urban Daytime	6,325	50	Dishwasher Next Room
Quiet Urban Nighttime	2,000	40	Small Theatre, Large Conference Room (Background)
Quiet Suburban Nighttime	632	30	Library
Quiet Rural Nighttime	200	20	Bedroom at Night Concert Hall (Background)
	63	10	Broadcast and Recording Studio
	20	0	Threshold of Hearing

Source: Public Roads - Living with Noise, July/August 2003 - (dot.gov)

## Who regulates highway noise? How do you determine a noise "impact"?

The Federal Highway Administration (FHWA) has developed regulations (23 CFR 772) that specify the requirements that highway agencies must meet on federally funded highway projects, and the Connecticut Department of Transportation (CTDOT) has outlined its implementation guidance in its *Highway Traffic Noise Abatement Policy for Projects Funded by the Federal Highway Administration* (Noise Policy). The Noise Policy establishes two criteria for identifying traffic noise resulting from a highway project. The first criterion is satisfied when future predicted noise levels would "approach or exceed" a set of Noise Abatement Criteria (NAC) established by FHWA regulations. For outdoor uses in residential areas, the NAC is 67 dB(A); CTDOT defines approaching as within 1 dB of this value (i.e. 66 dB(A) for residential areas). Therefore, locations where future noise levels are predicted to be 66 decibels or higher are considered "impacted."

The second criterion for identifying an "impact" involves locations where noise levels are expected to increase by 15 decibels or more over existing levels.



Source: [Traffic Noise Overview \(transportation.org\)](https://www.transportation.org), 2021



## How can noise impacts be mitigated?

Traffic noise impacts can be potentially reduced by modifying either the source of the noise (speed, volume, or type of vehicles on the highway), the location of the receiver (the person who hears the noise), or the path by which the noise reaches the receiver. Because it is impractical to reduce the speed, volume, or type of vehicles on a highway, or to relocate residences solely due to noise impacts, the most common approach to mitigating noise is the construction of noise barrier walls.

## How does CTDOT determine if noise barrier walls should be constructed?

CTDOT performs noise analyses within the limits of federally funded projects defined as "Type I" under 23 CFR 772.5 to determine if noise abatement is warranted, reasonable, and feasible in accordance with the Department's Noise Policy.

Type I projects are those that would meet one or more of the following criteria:

- Construction of a new highway
- Substantial vertical or horizontal alteration of a highway
- The addition of a through-traffic lane(s)
- The addition of an auxiliary lane in excess of 2,500'
- The addition or relocation of interchange lanes or ramps
- Restriping existing pavement for the purpose of adding a through-traffic lane or an auxiliary lane in excess of 2,500'
- The addition or substantial alteration of a weigh station, rest stop, ride-share lot or toll plaza

A noise barrier wall is proposed when a noise impact is predicted to occur as a result of a Type I project and the noise barrier wall is found to be feasible and reasonable. CTDOT considers engineering constraints, acoustical performance, public opinion, and final cost in determining if a noise barrier wall is reasonable and feasible to incorporate into a project.

## How are future noise levels predicted?

When planning a highway project, the FHWA Traffic Noise Model uses design and traffic data, including the number of buses and motorcycles, to predict noise levels during the noisiest hour of the day. Based on the noise levels predicted, the model identifies where impacts will occur and where a noise barrier wall should be considered as part of the project.