



The North DuSable Lake Shore Drive (NDLSD) Phase I Study is evaluating several environmental topics as part of Level 3 screening, including potential changes in traffic noise. Traffic Noise Analyses are required for projects that involve approvals from the Federal Highway Administration (FHWA) and when projects include specific improvements. In the case of NDLSD, a Traffic Noise Analysis is required because the remaining alternatives involve changes such as alterations to horizontal or vertical alignments, and new bus lanes or auxiliary lanes. During Level 3 Screening, potential changes in traffic noise levels associated with the remaining alternatives under consideration will serve as one of many criteria to help inform the selection of the preferred alternative.

## SOUND VS NOISE



### Sound

vibration of sound pressure waves in the air that your ear can detect



### Noise

an unwanted sound that can interfere with normal activities

Traffic sounds are typically considered noise since they are generally unwanted, and if too loud can affect every day activities. Sound/noise is measured on a logarithmic scale using units of decibels (dB).

## NOISE ANALYSIS PERIOD

Per Federal regulations, traffic noise analyses are completed for the worst noise hour of the day; that is, the hour with the highest combination of vehicle volumes and speeds. On NDLSD, this occurs during the morning peak hour, which is the hour used in the analysis for this project. During a typical hour, there will be peaks (e.g., a large platoon of vehicles, a pass-by of a motorcycle, or an accelerating car with a modified exhaust system) and valleys (e.g., when there is a gap in the traffic stream sometimes allowing other ambient noises to be heard).

**For analysis purposes, the time-varying sound levels including all of the peaks and valleys must be “averaged” into a one-hour equivalent noise level.**

### Examples of traffic noise sources



#### Noise Sources Legend

- Aerodynamics / Wind
- Exhaust
- Engine
- Tire / Pavement

### What creates traffic noise?

#### At lower speeds:

- Engine
- Gear Box & Transmission
- Exhaust

#### At higher speeds:

- Tire/Pavement Noise
- Aerodynamics of Vehicle

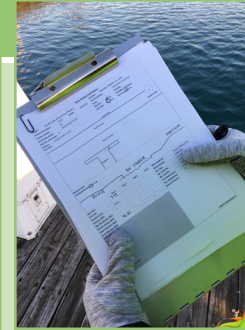


# MONITORING NOISE IN THE FIELD

Traffic noise is simulated for the project using the FHWA's Traffic Noise Model (TNM) software. This model considers roadway geometry, surrounding topography and features, traffic volumes, and noise-sensitive locations with potential to be affected by traffic noise (receptors).

Noise measurements are collected in the field along the project corridor to ensure TNM models reflect actual field conditions. Sophisticated sound measurement devices capture noise samples at select noise-sensitive locations, and the traffic creating the noise is counted at the same time. These measurements and traffic volumes are then entered into TNM for comparison against modeled results. If the modeled levels are similar to the measured levels, then the model is considered validated and suitable for predicting future noise levels with roadway improvements in place.

For the NDLS Phase I Study, 44 noise-sensitive locations were monitored along NDLS, the urban edge of the city and in Lincoln Park, during October 2020 and March 2021.



## IMPACTS

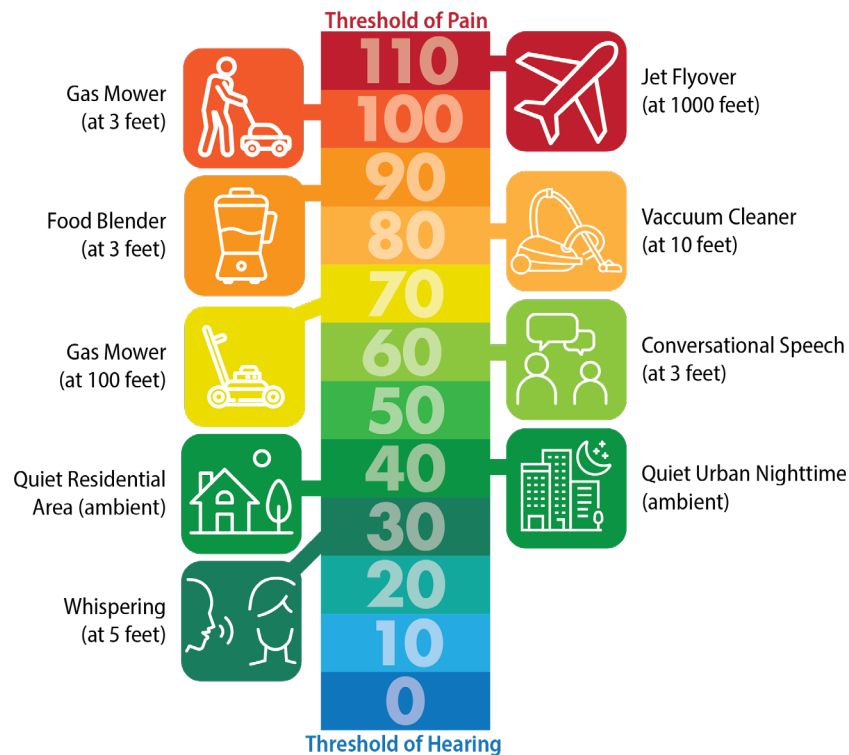
When evaluating traffic noise impacts of a project, TNM software is used to predict future noise levels. Sometimes these noise levels are increased to the point where they are considered an impact to nearby areas, or sometimes noise levels already exceed impact thresholds in the existing condition. FHWA and the Illinois Department of Transportation (IDOT) define what is considered an impact if the noise level threshold for the property type is exceeded. Common property types and their impact thresholds that exist within the NDLS study area include:

- 66 dB: residential properties, parks, places of worship, schools, trails, hospitals
- 71 dB: hotels, restaurants, offices

In addition, any noise level that increases by 15 dB or more compared to the existing condition is also considered an impact. For reference, a change of 10 dB is equivalent to a doubling or halving of noise level.

Changes in noise levels of +/- 3 dB are barely perceptible to the human ear. A change of noise levels would need to be 5 dB or more for a person to recognize differences from existing conditions.

### Common Sound Levels (Decibels)



## UPCOMING NDLS NOISE ANALYSIS

The Level 3 screening analyses will explore the differences in traffic noise levels between the No Action alternative and the five remaining build alternatives. Traffic noise analyses are one of the many Level 3 screening criteria that are being assessed to inform the selection of a preferred alternative. Further traffic noise analyses will be completed for the preferred alternative, and abatement measures will be considered for any identified impacts.

If you have any comments on the information in this handout, or any other project materials, please email the project team at [info@ndlsd.org](mailto:info@ndlsd.org).

Level 3 Screening Criteria  
Category: **ENVIRONMENTAL**

