

2.10 Noise

Sound is caused by the vibration of air molecules and is measured on a logarithmic scale with units of decibels (dB). Sound is composed of a wide range of frequencies, but the ear is not sensitive to all frequencies. The “A” weighted scale was devised to correspond with the ear’s sensitivity, and sound levels are measured as dBA on this scale. Highway agencies use a one-hour equivalent sound level, Leq(h), as a descriptor of traffic noise levels. Studies show that a change of three dBA is a barely perceivable change in noise, whereas a change of 10 dBA is perceived as being twice or half as loud.

Title 23 CFR 772 has developed noise abatement criteria (NAC) for assessing potential noise impacts (see Table 2-25). The criteria set forth in the regulations consider appropriate noise levels based upon land use activity. A traffic noise impact occurs when traffic noise levels approach (in Illinois this means within one dBA), meet or exceed the NAC for the associated land use activity, or if a substantial increase (in Illinois this means an increase of more than 14 dBA over existing noise levels) in predicted traffic noise level occurs over existing traffic generated noise levels even though the applicable NAC has not been reached.

TABLE 2-25
Noise Abatement Criteria Hourly A-Weighted Sound Level

Activity Category	Leq (h) ^a	Description of Activity Category
A	57 (exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if they are to continue to serve their intended purpose.
B	67 (exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (exterior)	Developed lands, properties or activities not included in Categories A and B.
D	—	Undeveloped lands.
E	52 (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source: FHWA. April 1992. Code of Federal Regulations. Title 23 CFR 772: Procedures for Abatement of Highway Traffic Noise and Construction Noise.

^a Considered a noise impact if the traffic noise level approaches (within one dBA), meets, or exceeds the NAC, or increases more than 14 dBA above existing traffic noise levels.

2.10.1 Noise Sources and Existing Conditions

Noise monitoring or modeling to determine traffic noise impacts was not conducted for the Tier One analysis. Existing noise sources and conditions are described below, and potentially affected noise-sensitive receptors (e.g., residences, churches, schools, parks) located adjacent to the proposed improvements have been identified (see subsection 2.10.2 regarding their locations.) A detailed noise analysis will be undertaken in Tier Two to identify traffic noise impacts, and consideration of abatement measures where a traffic noise impact is identified will be undertaken, as necessary.

As the study area is moderately to highly urbanized and the population density is high, many noise-producing human activities are present. Noise sources include road, railroad, aircraft, and other human activity. Major roadway and interstate facilities are located in the study area as are passenger and freight railroads. One notable noise source is O'Hare Airport on the eastern side of the study area. The study area is beneath the flight paths.

2.10.2 Potentially Noise-Sensitive Residential Areas and Non-Residential Sensitive Receptors

Locations of potentially noise-sensitive residential areas and non-residential receptors were identified in the study area. Forty-eight noise-sensitive residential areas representing concentrations of residential noise receptors and 30 noise-sensitive non-residential receptors, including 24 parks, three schools, and three churches, are spread throughout the study area. The largest concentrations of properties potentially affected by noise are along Thorndale Avenue and west of IL 83, along I-90, and along County Line Road (see Exhibit 2-11).