

## L. Noise

### 1. Introduction

This Section provides a summary of the Noise Measurements and Analysis Report, which can be found in the Appendix to this DEIS. A discussion of the methodology used to determine the noise impacts of the proposed project can be found in the full report located in the Appendix.

Sound is created when changes of pressure (waves) are produced in the air. These pressure changes are created at many frequencies (i.e., spacing of the waves). Sound is received and perceived when the human ear reacts to pressure changes. The average person's ear can detect sounds ranging from 20 to more than 10,000 hertz (Hz) (see Table III.L-1, Common Noise Levels). Each frequency is detectable at different pressure levels and so, the system for sound measurement that mimics the human ear is an A-weighted decibel system (dB(A)s). The human ear can barely detect a 3 dB(A) change in sound levels. A 6 dB(A) change in sound levels is approximately a doubling of sound wave pressure and results in a generally audible change. Sound measurements in this report were made using a Bruel & Kjaer Model 884, Type s2A, which is meant to measure A-weighted decibel levels as a mimic of the average human ear.

**Table III.L-1  
Common Noise Levels**

| <b>Sound Source</b>  | <b>(dBA)</b> |
|--|--------------|
| <u>Military jet, air raid siren</u>  | <u>130</u>   |
| <u>Amplified rock music</u>  | <u>110</u>   |
| <u>Jet takeoff at 500 meters</u>   | <u>100</u>   |
| <u>Freight train at 30 meters</u>  | <u>95</u>    |
| <u>Train horn at 30 meters</u>   | <u>90</u>    |
| <u>Heavy truck at 15 meters</u>  | <u>80</u>    |
| <u>Busy city street, loud shout</u>  | <u>80</u>    |
| <u>Busy traffic intersection</u>   | <u>80</u>    |
| <u>Highway traffic at 15 meters, train</u>   | <u>70</u>    |
| <u>Predominantly industrial area</u>   | <u>60</u>    |
| <u>Light car traffic at 15 meters, city or commercial areas or residential areas close to industry</u> | <u>60</u>    |
| <u>Background noise in an office</u>   | <u>50</u>    |
| <u>Suburban areas with medium density transportation</u>   | <u>50</u>    |
| <u>Public library</u>  | <u>40</u>    |
| <u>Soft whisper at 5 meters</u>  | <u>30</u>    |
| <u>Threshold of hearing</u>  | <u>0</u>     |

The site was modeled over a range of 1.8 by 1.0 miles using the Sound Propagation Model-SMP96. SMP96 is based on the International Organization for Standardization (ISO) 96 standards Part 1 and 2. ISO specifically addresses the atmospheric attenuation of sound and specifies an engineering method for calculating environmental noise sources by prescribing methods to determine the various attenuation effects observed during outdoor sound propagation.

Specifically, ISO 96 provides methods to allow users to address:

- General divergence of point sources;
- Atmospheric absorption;
- Ground attenuation (or reinforcement) from soft or hard ground;
- Attenuation from screens/barriers;
- Miscellaneous attenuation from industrial sites and foliage;
- Reflections; and
- Directivity of sources.

For the purpose of this analysis, 10 receptor points were considered. These receptor points were largely focused on the Route 22 corridor, as this would be the main route for Project traffic. Construction (especially for commercial uses) would occur in a manner largely “clustered” around the new Town Center. The area’s most sensitive receptors (a library and school) occur north of the Project and were included in the modeling. The receptor points are measured from a dominant source. The dominant sources for the receptor points are traffic and Metro North trains. The receptor points are used to analyze the existing conditions, the construction period of the Proposed Action, and the operational phase of the Proposed Action. The receptor identification for Exhibits III.L-1 through III.L-3 is as follows:

- (1) Wingdale Elementary School
- (2) Dover Plains Library
- (3) Route 22/55
- (4) Route 22/55
- (5) Route 22/55
- (6) Route 22/55
- (7) Metro North Platform
- (8) Proposed Residential East
- (9) Proposed Residential West (Golf Club)
- (10) Proposed Residential West (Hoag Road/Wheeler Road)

The New York State Department of Conservation (DEC) has stated that the ambient noise values should not be raised above a maximum of 65 dB(A) in a non industrial/commercial environment. Noise levels in industrial and commercial areas can exceed 65 dB(A) to level as high as 79 dB(A). The Federal Highway Administration (FHWA) recommends a maximum noise level of 67 dB(A) in non industrial/commercial areas, and a maximum noise level of 72 dB(A) in industrial and commercial areas.

As a point of reference, human conversations at a distance of two feet occurs at a level of 60 dB(A) with a calm voice, to 75 dB(A) with a raised voice.

## 2. Existing Conditions

### a. Ambient Noise Analysis

Measurements along Route 22/55 occurred 25 feet from the dominant source with no obstructions. The directly measured levels occurred at Wheeler Road, in sunny conditions, with minor winds and 30 to 35 degree temperatures (F). The monitored sound levels are presented in Table III.L-2, below. The measured levels were generally the result of vehicle noise from Route 22/55 and Metro North trains from locations measured. These locations were monitored for the AM and PM peak hours. The dominance of average and peak values at the AM and PM Peak hours would be expected to be increased.

Sound levels were first measured at the site's main "entrance" at the intersection of Route 22/55 and Wheeler Road. Noise measurements (as L(eq) taken from the proposed Town Center) varied from 59.1 dB(A) to 70.6 dB(A). The noise measurements at this location were taken at 25 feet from the dominant source. FHWA levels are determined at 50 feet from the sound source, and so, a 6 dB(A) reduction provides comparative levels at 53.1 dB(A) and 64.6 dB(A) respectively. The peak measurement of 89 dB(A) (83 dB(A) when reduced to FHWA levels) was recorded when a heavy duty, diesel truck passed through the area. These sound levels result from the existing traffic on Route 22/55 and the Metro North trains at the Wingdale Station. The average measurement for this point was typical for a moderately intense commercial use.

The Metro North trains were also measured as to their sound pressure level generation per the United States Environmental Protection Agency's (USEPA) publication *Community Noise* (1971). The train, in motion, varied from 94 to 97 dB(A) from the engine to 84 to 86 dB(A) from the passenger cars. The Route 22/55 receptors also receive some reflection from the existing buildings located on the Project Site.

Additional points were monitored to review "sensitive" receptors and to determine a more "ambient" condition away from the Route 22/55 corridor. The receptors were also located to the east of Route 22 on Pleasant Ridge Road (at the Wingdale Elementary School) and to the west of Route 22 on Pleasant Ridge Road (the Dover Plains Library). The results at these locations ranged from a high of 64.1 dB(A) at the Library to 56.7 dB(A) at the School. The Library's location on Route 22 results in an elevated sound level compared to the School.

In the case of the School, the peak sound level is largely the result of its own endemic activity. That is, the school entry experiences a surge of traffic (including buses) in its peak hours. The School itself is set back from Routes 22 and 55 and so, they act as an audible but only secondary sound source. The result is that the receptor at the School experiences lesser sound pressure levels than the measurement locations along Routes 22 or 55, but is well above "ambient" levels.

Finally, an existing rural residential area at the intersection of Wheeler Road and Hoags Corner Road showed the lowest sound level in the existing condition at 40 dB(A). This is due to its position well away from Route 22/55, Metro North and other existing sound sources. This puts the sound levels in this area in the category of quiet, suburban to rural neighborhoods.

**Table III.L-2  
Measured Noise Levels at Selected Intersection**

| Location                          | L(eq) | L(eq)<br>FHWA | L(h) | L(h)<br>FHWA |
|-----------------------------------|-------|---------------|------|--------------|
| AM Peak                           |       |               |      |              |
| Route 22/Wheeler Road - NW Corner | 59.1  | 53.1          | 85   | 79           |
| Route 22/Wheeler Road - SE Corner | 66    | 60            | 87   | 81           |
| Dover Plains Library              | 64.1  | -             | 90   | -            |
| Wingdale Elementary School        | 56.4  | -             | 65   | -            |
| PM Peak                           |       |               |      |              |
| Route 22/Wheeler Road - NW Corner | 68.7  | 62.7          | 89   | 83           |
| Route 22/Wheeler Road - SE Corner | 70.6  | 64.6          | 86   | 80           |
| Dover Plains Library              | 62.2  | -             | 80   | -            |
| Wingdale Elementary School        | 56.7  | -             | 89   | -            |

Noise levels, in the existing condition, were measured at the site's entrance on NYS Route 22/55 and Wheeler Road, NYS Route 22 and Pleasant Ridge Road and, the intersection of Hoags Corners Road and Wheeler Road. Noise measurements taken from the proposed Route 22/55 "entrance" varied from 50 dB(A) to 90 dB(A). These sound levels result largely from the existing traffic on Route 22/55. The peak measurement of 90 dB(A) was recorded when a truck queued at the intersection. Noise measurements taken at this intersection also include train sound idling and moving. When idling, the train produced an average of 75 dB(A) versus a 83 dB(A) when traveling. Since every 3 dB(A) is a doubling of sound pressure, the existing sound levels at the site's entrance are six to eight times higher than would be expected for a "typical" residential land use site. Similar recordings were observed at NYS Route 22 and Pleasant Ridge Road.

Traffic on Hoags Corners Road and Wheeler was minimal during the early afternoon and few vehicles passed in the measurement period. The ambient measurement for this point was between 30 and 40 dB(A). The peak measurements at this intersection ranged from 65 to 80 dB(A) with cars and trucks passing.

| INTERSECTION                   | 1 <sup>ST</sup> PERIOD | 2 <sup>ND</sup> PERIOD | PEAK/LOW | AVERAGE |
|--------------------------------|------------------------|------------------------|----------|---------|
| NYS RT 22/55<br>Wheeler Road   | 15 minutes             | 30 minutes             |          |         |
|                                | 72                     | 68                     | 90/50    | 76.5    |
| NYS RT 22<br>Pleasant Ridge Rd | 15 minutes             | 30 minutes             |          |         |
|                                | 70                     | 71                     | 86/50    | 68      |

|                              |            |            |       |    |
|------------------------------|------------|------------|-------|----|
| Hoags Corner<br>Wheeler Road | 15 minutes | 30 minutes |       |    |
|                              | 65         | 65         | 85/30 | 58 |

b. Model Analysis

The commercial receptors are number 3 through 7 and are arranged at the intersection of Route 22/55 and Wheeler Road and the Metro North station (see Exhibit III.L-1). The modeling shows that the Route 22/55 corridor is currently experiencing sound levels equivalent to a moderate intensity transportation corridor and commercial area. Receptors 1, 2, 8, 9 and 10 are located at areas considered “sensitive” and/or residential. Receptor 1 is located at the School and receptor 2 is located at the Library. Receptors 8 and 9 are located in proposed residential neighborhoods on potential sidewalks, while receptor 10 is located at an existing residence at the intersection of Wheeler Road and Hoags Corner Road.

The results at locations along Route 22/55 ranged from a high of 62.3 dB(A) to a low of 62.1 dB(A) (see Table III.L-3). In the instance of the Route 22/55 receptors, they receive dominant sound input from the traffic and from Metro North, with some reflection from the existing buildings on-site. Receptor 8 was in the lower end of the range at 46.8 dB(A). The measurement at receptor 8 is lower than might otherwise be expected due to there being less traffic on Wheeler Road east of Route 22/55 and barrier effects from the existing buildings.

The School was modeled at 55.2 dB(A). Its peak sound result is largely the result of its on endemic activity. The Library receptor was modeled at 60.4 dB(A), a result of its location directly on Route 22.

Residential receptor 10 shows that the lowest sound level at 38.5 dB(A). This measurement is due to its distance from Route 22/55, Metro North and other existing sound sources. Receptor 10 would be considered as a quiet, suburban to rural neighborhood.

**Table III.L-3**  
**Existing Conditions – Sound Level by Receptor**

|                     | Receptor |      |      |      |      |      |      |      |      |      |
|---------------------|----------|------|------|------|------|------|------|------|------|------|
| Model               | 1        | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   |
| Existing Conditions | 55.2     | 60.4 | 62.1 | 62.2 | 62.3 | 62.2 | 57.7 | 46.8 | 45.9 | 38.5 |

The noise levels recorded above all are approximately as expected for “typical” commercial and residential neighborhoods. At the entrance of the site on Hoags Corner Road and Wheeler Road, the site does not exceed the 67 dB(A) threshold at which FHWA (Federal Highway Administration) and NYSDOT (New York State Department of Transportation) (pursuant to 23 CFR 772.9 (b) (1)) which would require a noise barrier for any new highway

construction.<sup>+</sup> ~~At the entrance of the site on NYS Route 22/55 and Wheeler Road, the site does exceed the 72 dB(A) threshold which is listed under the FHWA (Federal Highway Administration) Noise Abatement Criteria for developed lands, properties or activities. Noise levels at other intersection were also above criteria standards. Interior noise levels (i.e., inside a typical residence) will be some 20 dB(A) lower than the existing ambient levels due to the insulating effects of the house framing and windows (NYS DOT EPM 3.1). Modern development materials (i.e., double pane windows, insulation, etc.) will decrease interior noise levels more than 20 dB(A).~~

### 3. The Future Without the Proposed Project

#### a. Local Roadways

Future noise levels on local roadways in the No Build site condition ~~will~~ would also increase but somewhat less than the build condition. ~~In the existing condition, noise levels already “exceed” FHWA levels.~~ In the No Build condition, traffic volumes only increase slightly, thus, noise levels ~~will~~ would not significantly deviate from their current sound level.

### 4. Potential Impacts of the Proposed Project

Potential impacts of the Project were modeled to estimate noise measurements during the operational phase of the Project Site and measurements during the construction phase.

#### a. Operational Phase

The Proposed Action would not cause a significant increase in sound levels at the “sensitive” receptors modeled. The sensitive receptors include the School and Library, receptors 1 and 2 respectively. At the School, an increase of 0.8 dB(A) is expected. This increase is well below the range of human detection. At the Library, the increase would be 2.7 decibels and therefore would be inaudible to barely audible. This increase would result from increased vehicular traffic travelling on Route 22 during the peak hours. This would not change the character of the sound at this location as the Library already fronts directly onto Route 22.

The receptors along Route 22/55 and at the Metro North station (receptors 3 through 7) would experience some sound level increase. The sound levels at these receptors would increase from the low 60’s to the mid 60’s dB(A). For example, receptor 3 would increase from 62.1 to 67.1 dB(A). This is an increase of 5.0 dB(A), which is audible but an acceptable increase in sound level according to the NYSDEC. This receptor was measured and modeled at 25 feet from the dominant sound source. As described previously, the FHWA standard for measurement is 50 feet. Therefore, the final sound levels are reduced by 6 dB(A) to 61.1 dB(A). The measurement at receptor 3 is the highest predicted to occur with the Project in operation. While the raw modeled levels are above the NYSDEC’s recommended levels of 65 dB(A) and equal to FHWA’s recommended level of 67 dB(A) for non-industrial settings, adjusting the modeled

<sup>+</sup> This level is used only to provide a basis for comparison as no new highway construction is proposed.

number to the setback of 50 feet as prescribed by the FHWA would reduce the sound measurement significantly below the two thresholds.

The residential receptors east and west of the Route 22/55 corridor (receptors 8 and 9) would experience the highest increase of those modeled. Receptor 8 would increase from 45.9 dB(A) to 57.1 dB(A), and receptor 9 would increase from 46.8 dB(A) to 56.7 dB(A) (see Table III.L-4). Sound pressure levels (SPL) at both receptors would remain significantly below the NYSDEC's recommended level of 65 dB(A) but above the recommended 6 dB(A) increase. There are presently no residences at or near either location in the existing conditions or during the construction period. These receptors are located at proposed sidewalks in new residential neighborhoods. New residents would be unaware and unaffected by the increase in noise above the existing conditions (i.e., conditions present before they move in to the proposed communities). Further, in the case of the eastern receptor, a portion of the increase (approximately 3 dB(A)) would be as a result of the demolition of several buildings that act as a screen to sounds from Routes 22/55 in the existing conditions. Therefore, for the above reasons, none of these predicted increases would need to be mitigated.

**Table III.L-4  
Comparison of Noise Levels by Receptor**

| Model                         | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   |
|-------------------------------|------|------|------|------|------|------|------|------|------|------|
| Existing Conditions           | 55.2 | 60.4 | 62.1 | 62.2 | 62.3 | 62.2 | 57.7 | 46.8 | 45.9 | 38.5 |
| Proposed Action - Operational | 56.0 | 63.1 | 67.1 | 66.4 | 66.6 | 67.0 | 62.1 | 56.7 | 57.1 | 42.6 |

The Hoags Corner Road receptor was the quietest in the modeled and measured existing condition. Upon Project completion, it would experience an audible increase in SPL of 4.1 dB(A). This increase would be due to some added traffic on Hoags Corner Road and added traffic along Wheeler Road. The increase would not, however, be intrusive or change in character. At 42.6 dB(A), the location would still be considered a quiet residential neighborhood.

#### b. Construction Phase

Construction of the Project would not cause a significant increase in SPL's at the School and the Library. At the School, an increase of 0.3 dB(A) is expected. This increase is well below the range of human detection. At the Library, the increase would be 1.8 dB(A), and so, would be inaudible (see Table III.L-5).

The receptors along Route 22/55 and at the Metro North station would experience some sound level increase from the existing condition. Along Route 22/55, sound levels would increase from the low 60's to the mid 60's dB(A). The highest sound pressure level would occur at receptors 3 and 4. Sound levels at these two receptors would reach 67.4 dB(A). These two measurements, as well as the measurements of receptors 5,6 and 7 are above the NYSDEC recommended level of 65 dB(A). Receptors 3 through 6 are equal to the FHWA recommended level of 67 dB(A). As described previously, these sound levels were measured at half the distance that is prescribed by the FHWA. Adjusting these sound measurements to 50 feet would reduce the SPL's of all five receptors to well below

the thresholds described by the NYSDEC and the FHWA. The increase to receptors such as 7, which is removed from Route 22/55, is likely the result of the demolition of buildings that act as reflectors of some of the sound from Route 22/55.

The Hoags Corner receptor was the quietest in the modeled existing condition. It would experience a temporary increase in SPL of 17.8 dB(A) during construction of residential areas at the west end of the Project Site. This is the inevitable result of temporary occurrence of construction equipment in the area. Since this noise increase would be temporary, no permanent features need to be incorporated in the Project. However, as provided in NYSDEC's *Assessing and Mitigating Noise Impacts*, operational hours could be limited to contain the impact to daytime conditions. For example, external construction prohibited one day per week. Some restrictions on construction hours are also common in municipal noise ordinances. Finally, the construction-level increase would decline to 4.1 dB(A) as the neighborhood is completed. At 42.6 dB(A), the location would still be considered a quiet residential neighborhood.

**Table III.E-5  
Comparison of Sound Levels by Receptor**

| <u>Model</u>                          | <u>1</u>    | <u>2</u>    | <u>3</u>    | <u>4</u>    | <u>5</u>    | <u>6</u>    | <u>7</u>    | <u>8</u>    | <u>9</u>    | <u>10</u>   |
|---------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <u>Existing Conditions</u>            | <u>55.2</u> | <u>60.4</u> | <u>62.1</u> | <u>62.2</u> | <u>62.3</u> | <u>62.2</u> | <u>57.7</u> | <u>46.8</u> | <u>45.9</u> | <u>38.5</u> |
| <u>Proposed Action - Construction</u> | <u>55.5</u> | <u>62.2</u> | <u>67.4</u> | <u>67.4</u> | <u>67.2</u> | <u>67.3</u> | <u>65.9</u> | <u>62.0</u> | <u>59.7</u> | <u>56.2</u> |

~~The proposed project will include stationary sources of sound level such as heating, ventilating and air conditioning (HVAC). The HV/AC units will be used on-site for both the residential and commercial structures. HV/AC noises tend to be dominated externally by compressor and fan noises. Residential units are generally smaller and have sound levels of 60 to 65 dBA at 10 feet. In this case, it is entirely possible to place all residential AC compressor units behind the proposed residential units. As such, the separation distances and the additional effects of the buildings themselves will make them indistinguishable from ambient residential noises in the neighborhood around Route 22/55.~~

~~With regard to commercial AC units, they will be in the "Village Center" and usually are placed on roof tops of commercial buildings. This will place the units well away (hundreds of feet) from existing residences. Commercial units are generally larger and have sound levels ranging from 65 to 75 dBA at 10 feet. However, these units will be separated from the new residential units by height and distance. Finally, sound/noise levels at the intersection of Route 22/55 and Wheeler Road (to become Main Street) already are at a peak of 90 dB(A) due to traffic and the railroad. For the above reasons, the commercial AC units will not significantly increase sound levels at this location.~~

~~a. Construction Impacts~~

~~During construction, noise levels will be temporary and will occur at two distinctly different levels. The temporary component results from the transient nature of the construction process. Noise levels of "heavy" construction equipment ranges from 79 to 92 dBA at 50 feet. The U.S. EPA reports noise levels at housing projects range from a high of 88 to a low of 75 dBA from grading through finishing operations. In this case,~~

~~noise levels of up to 78 to 88 dBA will occur for periods of several hours up to several weeks. The temporary sound levels will also occur due to the site and receptor's relative topographic positions to that point in the construction. No "screen" for this temporary noise level will occur.~~

~~The proposed project's use and long term activities will not contravene the local noise ordinance (Town of Dover Code Chapter 107 Noise). Construction, demolition and excavation: the erection, including excavating, demolition, alteration or repair, of any building is permissible between the hours of 7:00 a.m. and 9:00 p.m., except in case of an urgent necessity in the interest of public safety. Thus, commercial noise is prohibited from the hours of 10:00 p.m. and 7:00 a.m. on weekdays or at any time on Sundays/weekends or holidays. The proposed construction traffic at times may exceed these values. However, these numbers are exceeded themselves periodically as shown in Table III.L-1 of the three intersections observed.~~

#### ~~b. Local Roadways~~

~~The levels of sound which would be "created" at this site by traffic generated by long term use will have no significant impact on the upper, existing noise levels which already occur in the area's neighborhoods. The traffic from the site will be largely residential and so, will generate sound at 55 to 62 dB(A)'s.~~

~~The existing condition at NYS Route 22/55 is already 50 to 90 dB(A) or at a sound level typical of more suburban residential areas. This higher existing noise level is due to Route 22/55 acting as a primary collector road for residential and commercial traffic. The railroad and associated traffic also add to the sound peaks at this location. The project will not create a level of noise that would noticeable elevate the existing sound levels on NYS Route 22/55. It will increase the percentage of time that the area experiences an increase in sound levels but should not create a detectable increase in peak sound levels. This will be due to increased frequency of residential, railroad and truck traffic. The result will be an increased duration of higher and peak sound levels for both construction deliveries and operational deliveries (see Section 2.1 above for prior truck activity levels).~~

~~The intersection of NYS Route 22/55 and Wheeler already experiences a sound level somewhat above the "norm" for a "rural" residential/commercial neighborhood, mid-day (decibel levels in the upper 50's versus upper 40's). That is, it is more suburban than rural in character. The proposed project is also residential and NYS Route 22/55 will operate at an acceptable Level of Service. The proposed action shows increase in traffic on these streets. This will increase the percentage of time that the area experiences an increase in sound levels but should not create a detectable increase in peak sound levels.~~

## 5. Proposed Mitigation

As described previously, the ~~p~~Project would not result in significant adverse noise impacts. In addition, construction hours ~~will~~would be limited for outdoor activities from 7 a.m. to 9 p.m. Architectural "irregularities", such as offset walls, balconies, roof formers, etc. can also be maximized to reflect/scatter sound in many directions.