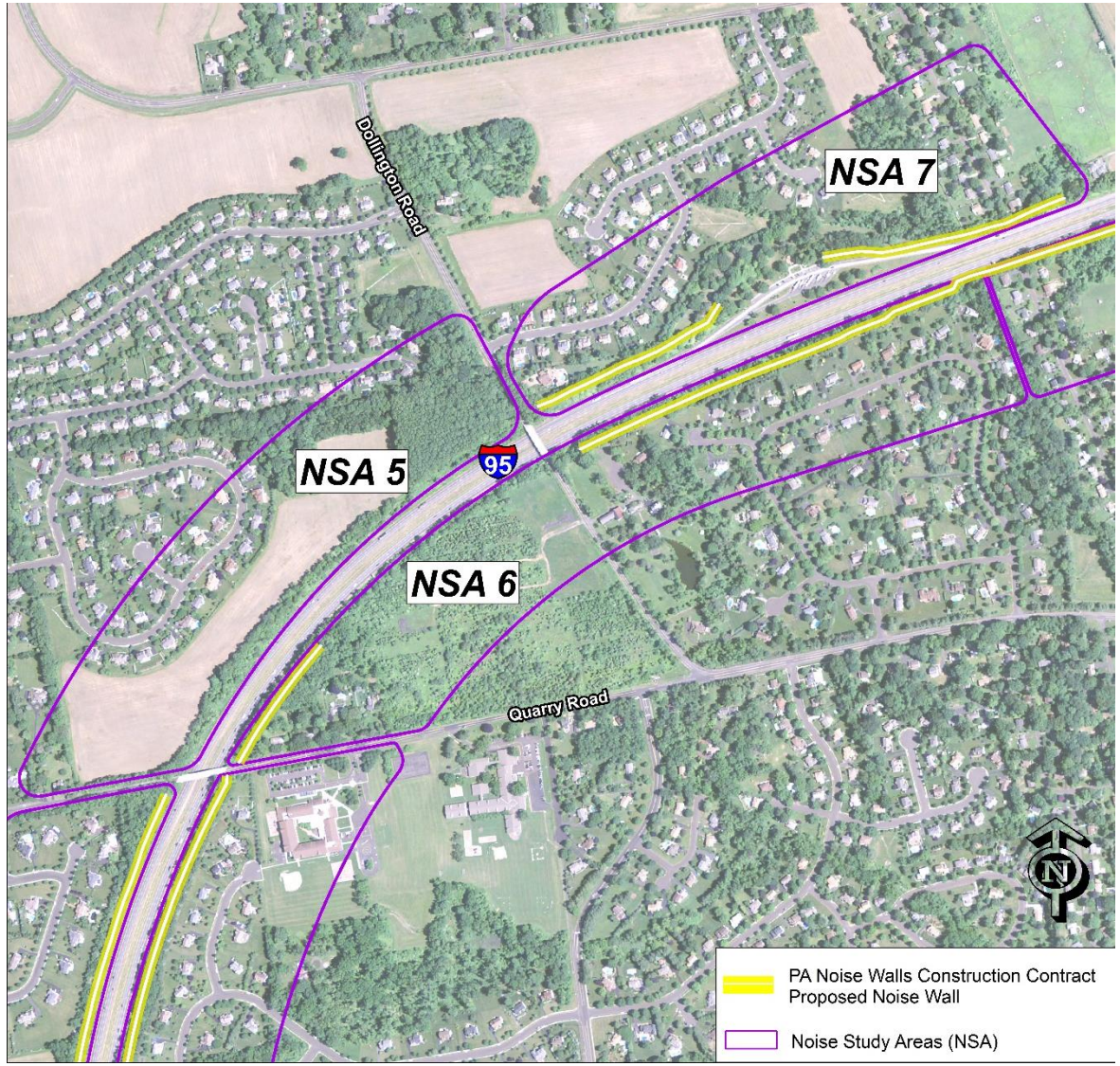
Lower Makefield Township Community Meeting
Scudder Falls Bridge Replacement Project

DELAWARE RIVER JOINT TOLL BRIDGE COMMISSION
Michael Baker INTERNATIONAL

Introduction

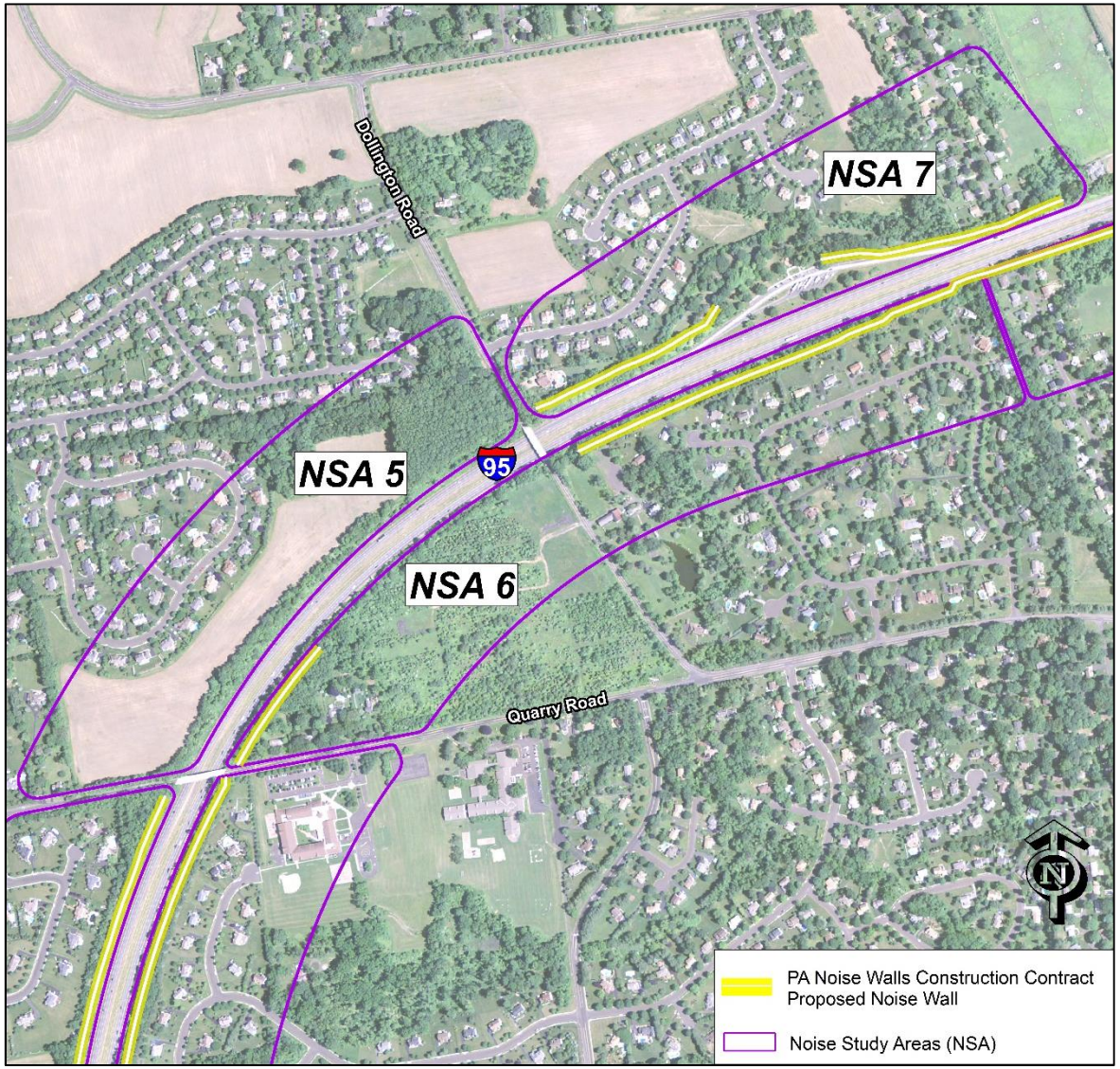
A Supplemental Noise Analysis Study was performed in January 2016 for Noise Study Areas (NSA) 5, 6 and 7 based on public comments and input received during the December 3, 2015 public meeting.



Introduction

Noise Study Areas (NSA) Neighborhoods

- NSA 5: Makefield Brook, Makefield Brook II, and Fairfield at Farmview
- NSA 6: Snipes Tract (I-95 and Quarry Road)
- NSA 7: Longshore Estates



Presentation Overview

- Regulatory Requirements
- Typical Noise Analysis Methodology
- Impact and Abatement Criteria
- Analysis Performed to Date
- Results of New Noise Analysis
- Conclusions
- Questions and Answers

Regulatory Requirements

- A Type I Highway Noise Analysis is required when capacity is added.
  The proposed Scudder Falls project is adding through lanes; therefore it is considered to be a capacity-adding project.

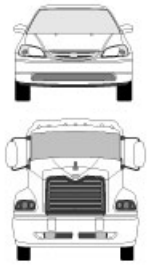
- The analysis is governed by *Procedures for Abatement of Highway Traffic Noise and Construction Noise* (Federal Regulation 23 CFR 772).

- For PennDOT projects, analysis guidance is provided in PennDOT Publication No. 24, *Project Level Highway Traffic Noise Handbook*.

- Bi-state self-supporting agencies (like the DRJTBC) can follow the federal or state regulations and/or have their own policies.

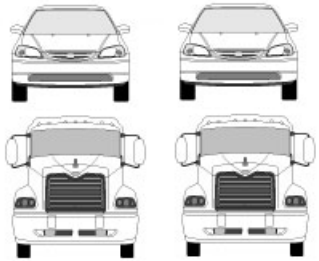
HOW TRAFFIC VOLUMES AFFECT SOUND LEVELS

TRAFFIC SOURCE



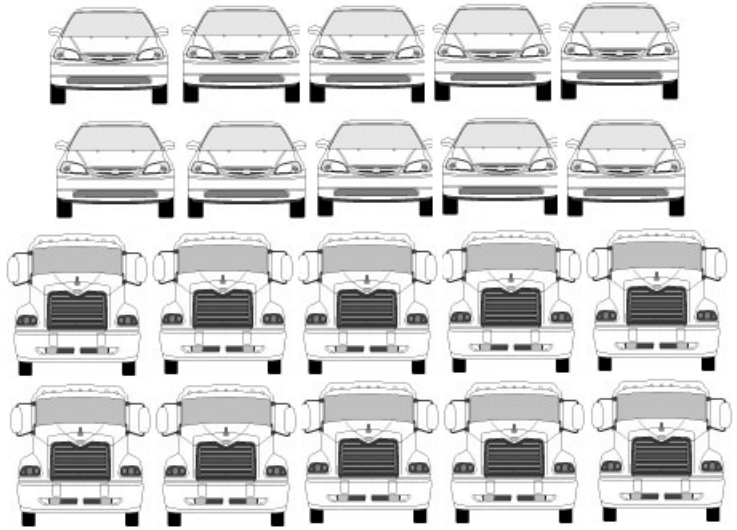
50 DECIBELS

DOUBLING THE TRAFFIC ADDS 3 DECIBELS



50 + 3 = 53 DECIBELS

10 TIMES THE TRAFFIC ADDS 10 DECIBELS



50 + 10 = 60 DECIBELS

Typical Noise Analysis Methodology

Below are the typical steps for evaluating highway noise impacts:

- Identify land uses-residential, parks, schools, churches, etc.
- Perform short-term and/or long-term noise monitoring to validate the computer model. Using future traffic peak hour volumes, predict the design year (2030) sound levels using the FHWA approved TNM 2.5 computer model and identify the impacted sites.
- Determine if the abatement meets criteria for impacted sites.

Impact Criteria

- If the design year sound level is predicted to meet or exceed 66 decibels (dBA) as averaged during the peak period for noise, then the site is impacted and abatement is considered.

- The peak period sound level is based on the computer modeled design year traffic volumes with the construction of the proposed build alternative.

The Impact Criteria is the same for FHWA, PennDOT and the DRJTBC, but the Abatement Criteria is different.

Abatement Criteria

The Feasibility and Reasonableness Abatement Criteria to construct noise walls is different for FHWA/PennDOT and the DRJTBC.

For FHWA/PennDOT projects:

- A minimum 5 dBA reduction is required for the majority (50^{+} %) of the impacted sites with at least one site receiving 7 dBA reduction.
- A maximum “Square Footage [of noise barrier] Per Benefited Receptor” of 2,000 SF/BR cannot be exceeded.

Abatement Criteria

In response to public input, the feasibility and reasonableness criteria was upgraded by the DRJTBC to provide additional abatement.

For the Scudder Falls Bridge Project:

- A minimum 5 dBA reduction was analyzed for the majority (50^{+} %) of the front row impacted sites.
- The previous cost reasonableness (SF/BR) criteria was waived.

Analysis Performed in Relation to NSAs 5, 6 and 7

2009 Environmental Assessment Technical Memo:

- Project wide, 57 measurements were performed.
- Recommended noise walls for construction in NSA 6 and NSA 7 for impacted sites.
- No noise impacts were predicted in NSA 5.

New Analysis Performed at NSAs 5, 6 and 7

In response to public concern received during the December 3, 2015 Open House, the DRJTBC collected new noise measurements and performed analysis in January 2016 for the following NSAs:

- NSA 5: Determine if there are new impacts and recommend abatement, if necessary.
- NSA 6: Determine if there are new impacts along the north side of Quarry Road and if so, determine if the proposed noise wall should be lengthen to the east.
- NSA 7: Determine if there are new impacts along Pownal Drive and Bartlett Court and if so, determine if the "gap" between the recommended barriers near the PennDOT rest stop should be closed.

New Analysis Performed at NSAs 5, 6 and 7

Measurements were collected the week of January 11, 2016, with additional modeling at the following sites:

NSA 5

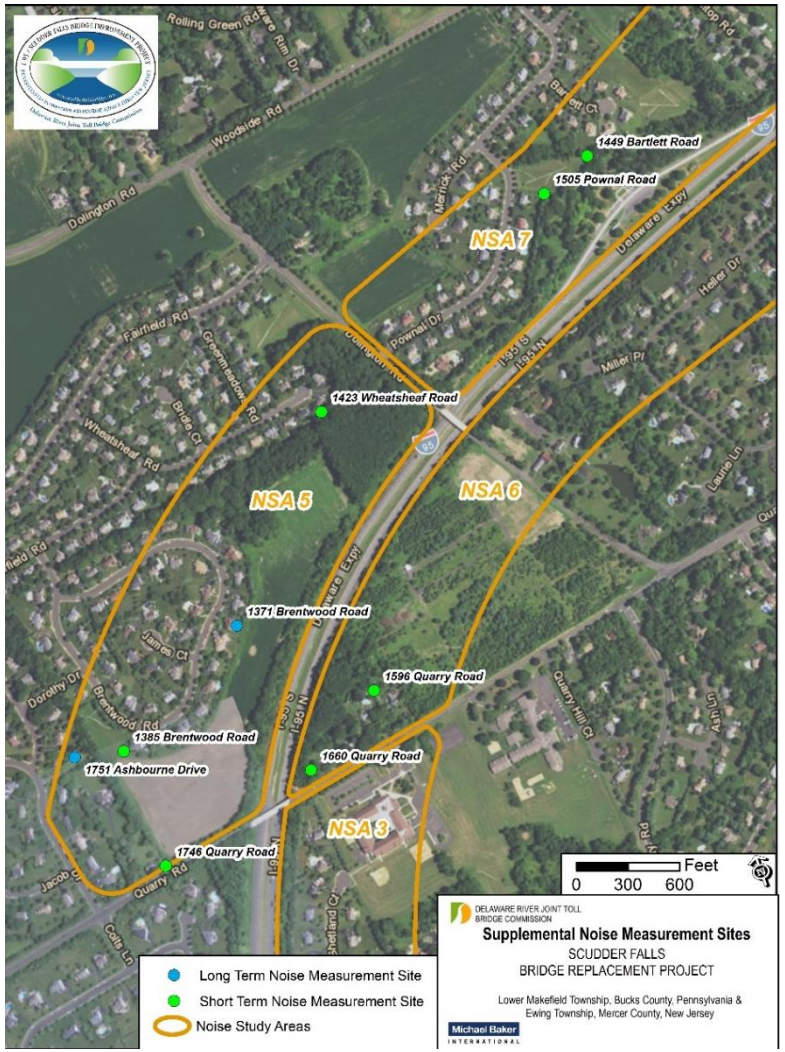
1746 Quarry Road
1751 Ashbourne Drive
1371 Brentwood Road
1385 Brentwood Road
1423 Wheatsheaf Road

NSA 6

1660 Quarry Road
1596 Quarry Road

NSA 7

1505 Pownall Road
1449 Bartlett Court



New Analysis Results

NSA 5 Peak Period Measurement Data

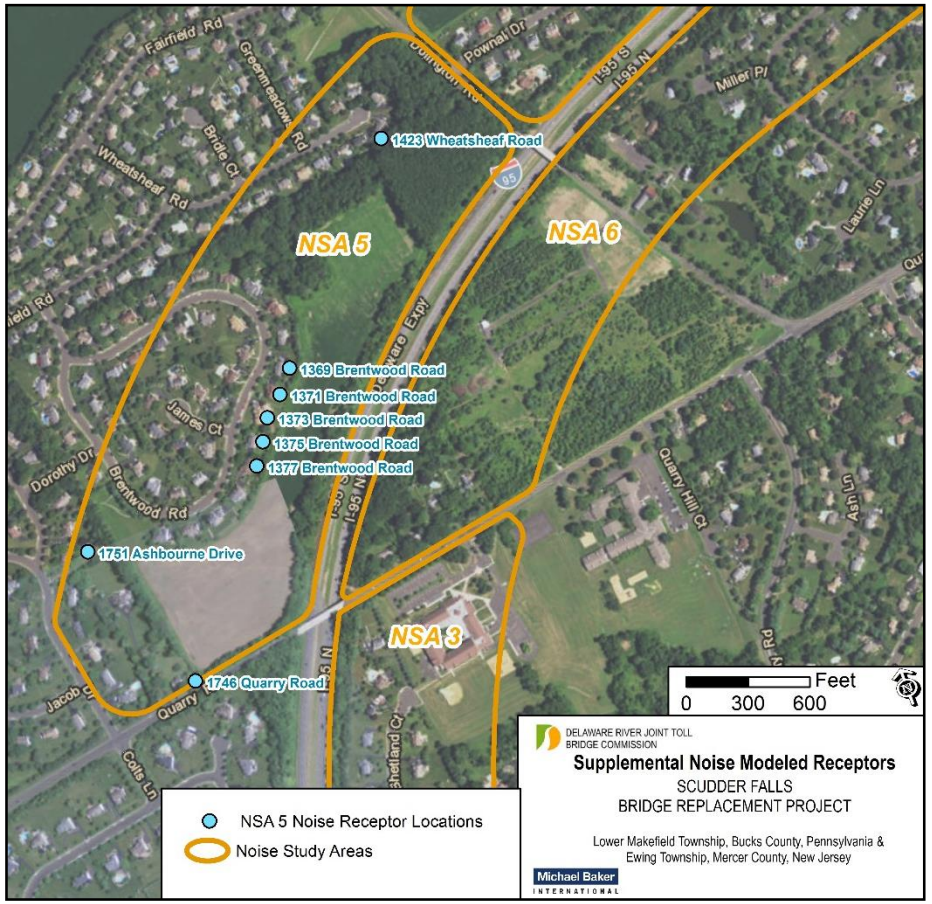
Site	Location	AM Peak Traffic Sound Level (6-9AM)	PM Peak Traffic Sound Level (4-8PM)
1	1751 Ashbourne Drive	49	48
2	1371 Brentwood Road	57	61
3	1385 Brentwood Road	50	51
4	1423 Wheatsheaf Road	53	60
5	1746 Quarry Road	57	61

New Analysis Results

NSA 5 Modeling Results

Modeled Receptor Site Locations	Design Year Modeled Sound Level	Impact Criteria	Impact?
1379 Brentwood Road	61	66	No
1377 Brentwood Road	59	66	No
1375 Brentwood Road	61	66	No
1373 Brentwood Road	58	66	No
1371 Brentwood Road	59	66	No
1369 Brentwood Road	60	66	No
1746 Quarry Road	61*	66	No
1751 Ashbourne Drive	55	66	No
1423 Wheatsheaf Road	60	66	No

*Quarry Road total sound level also influenced by Quarry Road traffic. The I-95 sound level contribution to this site is 60 dBA.



New Analysis Results

NSA 6 Peak Period Measurement Data

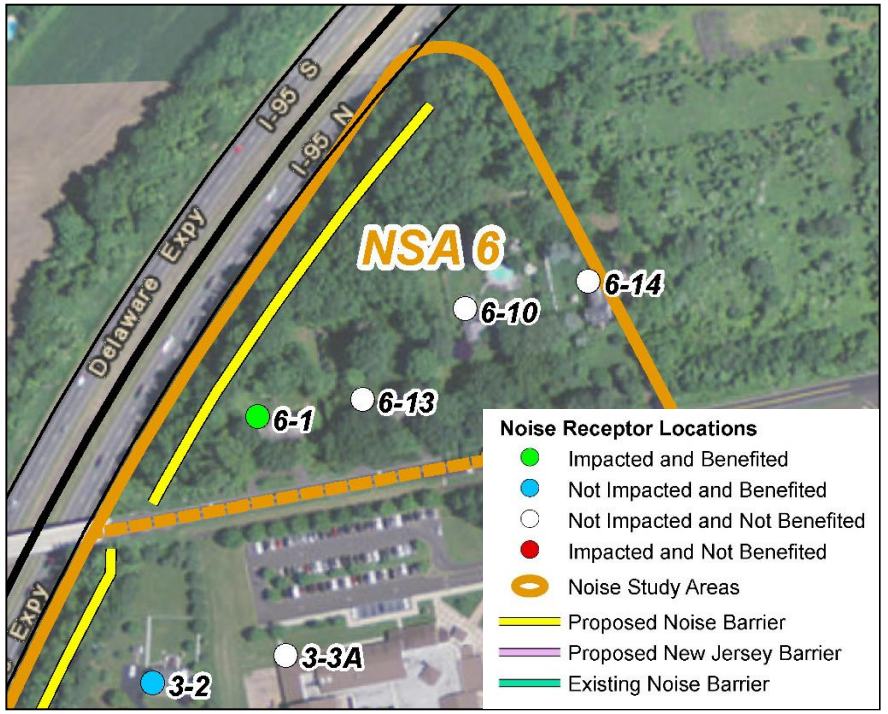
Site	Location	AM Peak Traffic Sound Level (6-9AM)	PM Peak Traffic Sound Level (4-8PM)
1	1660 Quarry Road	66	66
2	1596 Quarry Road	55	59

Results for NSA 6 indicate that the peak period measurement data exceeded the previously predicted and impacted site at 1660 Quarry Road and did not approach or exceed the criteria at 1596 Quarry Road.

New Analysis Results

NSA 6 Modeling Results

Modeled Receptor Site Locations	Design Year Modeled Sound Level	Impact Criteria	Impact?
1660 Quarry Road (6-1)	70	66	Yes
1640 Quarry Road (6-13)	63	66	No
1620 Quarry Road (6-10)	62	66	No
1596 Quarry Road (6-14)	60	66	No



The modeling results for the residences in NSA 6 along Quarry Road indicate that the previously predicted and impacted site is still impacted and the others are below the impact criteria.

New Analysis Results

NSA 7 Peak Period Measurement Data

Site	Location	AM Peak Traffic Sound Level (6-9AM)	PM Peak Traffic Sound Level (4-8PM)
1	1505 Pownal Road	53	53
2	1449 Bartlett Court	53	54

New Analysis Results

NSA 7 Modeling Results

Receptor Site Location	Design Year Modeled Sound Level	Impact Criteria	Impact?
1513 Pownal Drive	64	66	No
1445 Bartlett Court	61	66	No
1525 Pownal Drive	64	66	No
1517 Pownal Drive	67	66	Yes
1507 Pownal Drive	60	66	No
1451 Bartlett Court	58	66	No
1521 Pownal Drive	65	66	No
1523 Pownal Drive	65	66	No

Receptor Site Location	Design Year Modeled Sound Level	Impact Criteria	Impact?
1515 Pownal Drive	67	66	Yes
1519 Pownal Drive	67	66	Yes
1511 Pownal Drive	64	66	No
1509 Pownal Drive	62	66	No
1449 Bartlett Court	59	66	No
1447 Bartlett Court	60	66	No
1446 Bartlett Court	58	66	No

The modeling results for the residences in NSA 7 along Pownal and Bartlett indicate that the previously predicted and impacted sites are still impacted and the others are below the criteria.

Conclusions

- The noise abatement proposed in the Environmental Assessment Technical Memo (2009) has been validated by the final design and new noise measurements and analysis.

- The existing noise measurements and the new noise analysis results show that the previously impacted sites are still impacted, and the noise wall design at those locations will move forward.

- The existing noise measurements and the new noise analysis results also showed that the previously non-impacted sites at NSAs 5, 6, and 7 are still not impacted and, as a result, there are no proposed additions or changes to the noise wall locations.

Questions and Answers

Supplemental Slides

Lower Makefield Township Community Meeting

Lower Makefield Township Community Meeting

Existing Measured Long Term Noise Levels – 1371 Brentwood Road

Hourly Time Period	Date	Measured Sound Level	Hourly Time Period	Date	Measured Sound Level	Hourly Time Period	Date	Measured Sound Level
2 PM	1-11-16	51.9	6 AM	1-12-16	56.8	10 PM	1-12-16	51.0
3 PM	1-11-16	51.3	7 AM	1-12-16	56.9	11 PM	1-12-16	50.2
4 PM	1-11-16	51.2	8 AM	1-12-16	53.9	Midnight	1-13-16	48.4
5 PM	1-11-16	51.7	9 AM	1-12-16	55.3	1 AM	1-13-16	45.5
6 PM	1-11-16	50.5	10 AM	1-12-16	57.8	2 AM	1-13-16	46.6
7 PM	1-11-16	49.4	11 AM	1-12-16	58.6	3 AM	1-13-16	46.7
8 PM	1-11-16	49.5	Noon	1-12-16	58.5	4 AM	1-13-16	48.4
9 PM	1-11-16	50.8	1 PM	1-12-16	58.6	5 AM	1-13-16	51.2
10 PM	1-11-16	52.0	2 PM	1-12-16	59.4	6 AM	1-13-16	54.0
11 PM	1-11-16	52.2	3 PM	1-12-16	57.7	7 AM	1-13-16	55.3
Midnight	1-12-16	52.1	4 PM	1-12-16	57.0	8 AM	1-13-16	53.8
1 AM	1-12-16	51.1	5 PM	1-12-16	61.0	9 AM	1-13-16	53.0
2 AM	1-12-16	50.8	6 PM	1-12-16	60.6	10 AM	1-13-16	51.5
3 AM	1-12-16	51.6	7 PM	1-12-16	57.8	11 AM	1-13-16	50.8
4 AM	1-12-16	53.0	8 PM	1-12-16	52.0	Noon	1-13-16	52.2
5 AM	1-12-16	55.9	9 PM	1-12-16	51.0	1 PM	1-13-16	49.0

Existing Measured Long Term Noise Levels – 1751 Ashbourne Road

Hourly Time Period	Date	Measured Sound Level	Hourly Time Period	Date	Measured Sound Level	Hourly Time Period	Date	Measured Sound Level
2 PM	1-13-16	47	9 PM	1-13-16	43.2	4 AM	1-14-16	40.9
3 PM	1-13-16	45.9	10 PM	1-13-16	39.0	5 AM	1-14-16	44.9
4 PM	1-13-16	43.8	11 PM	1-13-16	38.5	6 AM	1-14-16	48.8
5 PM	1-13-16	48.2	Midnight	1-14-16	36.1	7 AM	1-14-16	46.7
6 PM	1-13-16	47.6	1 AM	1-14-16	37.0	8 AM	1-14-16	47.5
7 PM	1-13-16	41.5	2 AM	1-14-16	36.4	9 AM	1-14-16	46.8
8 PM	1-13-16	40.9	3 AM	1-14-16	37.7	-	-	-

Analysis Performed in Relation to NSAs 5, 6 and 7

Final Design Assessment (2015)

- Performed per updated 23 CFR 772, updated PennDOT Publication No 24 and the DRJTBC criteria
- Confirmed results of 2007 Assessment
- Achieved minimum 5 dBA decrease for 50% of front row of impact sites for NSA 6 and 7.
- NSA 5 was not analyzed since 2007 study did not identify an impact and no noise abatement was proposed.