

Appendix I

Noise

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PARSONS

Traffic Noise Impact Analysis

Clear Path 465

Des. 1400075

Indiana Department of Transportation

Federal Highway Administration



Prepared for INDOT Central Office

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LIST OF ABBREVIATIONS

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- CFR – Code of Federal Regulations
 - CNE – Common Noise Environment
 - dB – Decibels
 - EA – Environmental Assessment
 - EB – Eastbound
 - FHWA – Federal Highway Administration
 - $L_{eq}(h)$ – Hourly Equivalent Sound Level
 - INDOT – Indiana Department of Transportation
 - LOS – Level of Service
 - MPH – Miles Per Hour
 - NEPA – National Environmental Policy Act
 - NAC – Noise Abatement Criteria
 - NB – Northbound
 - SB – Southbound
 - TNM – Traffic Noise Model
 - WB – Westbound



Executive Summary

A Traffic Noise Impact Analysis was conducted for the Clear Path 465 project in Indianapolis, Marion County, Indiana. The project includes improvements to the I-465/I-69 interchange as well as improvements to adjacent sections of I-465, I-69, and Binford Boulevard. The Federal Highway Administration (FHWA) Traffic Noise Model (TNM) Version 2.5 was used to predict existing and future design year noise levels. Because design year noise levels are predicted to approach or exceed the FHWA Noise Abatement Criteria (NAC), the project has been found to have traffic noise impacts. Based on the Indiana Department of Transportation (INDOT) Traffic Noise Analysis Procedure (2017), the feasibility and reasonableness of noise barriers were considered at all locations in the project area where noise impacts were identified under the future build alternative. Based on this evaluation, seven feasible and cost-effective barriers were identified for this project. These locations are summarized in the table below:

Table ES-1: Feasible and Reasonable Noise Barriers

NOISE BARRIER	COMMON NOISE ENVIRONMENT	LOCATION	LENGTH (FEET)	NUMBER OF BENEFITED RECEPTORS
1	1	East side of I-69, north of 82nd Street	800	46
2	6	East side of I-69, south of 82nd Street	350	84
3	8	North of 75th Street along I-465 NB to I-69 NB ramp	1,231	176
4	10	North side of I-465, west of Allisonville Road	2,000	288
6	13	South side of I-465, east of Allisonville Road	5,231	203
7	15, 16	West side of I-465, south of 75th Street	5,500	92
8	17, 18, 19	East side of I-465, near 71st Street	4,900	94



1.0 Project History and Background Information

1.1 PURPOSE OF THE TRAFFIC NOISE IMPACT ANALYSIS

The purpose of this Traffic Noise Impact Analysis is to evaluate noise impacts and abatement under the requirements of Title 23, Part 772 of the Code of Federal Regulations (23 CFR 772) “Procedures for Abatement of Highway Traffic Noise” for Clear Path 465. The project involves the modification of the I-465/I-69 interchange and added travel lanes on the I-465 mainline which makes this a Type I project in accordance with 23 CFR 772. This regulation provides procedures for preparing operational and construction noise studies and evaluating noise abatement considered for federal and federal-aid highway projects. According to 23 CFR 772.3, all highway projects that are developed in conformance with this regulation are deemed to be in conformance with FHWA noise standards.

The INDOT Traffic Noise Analysis Procedure establishes INDOT policy for implementing 23 CFR 772 in Indiana. The INDOT Traffic Noise Analysis Procedure outlines the requirements for analyzing highway traffic noise. Noise impacts associated with this project will be included in the project’s Environmental Assessment (EA), in compliance with the National Environmental Policy Act (NEPA).

1.2 PROJECT DESCRIPTION

The Clear Path 465 project is located in Indianapolis, Marion County, Indiana. The interchange involves connections between I-465, I-69, and Binford Boulevard. The I-69 corridor and the interchange are two of the most heavily traveled commuter corridors in the area. I-69 and I-465 each currently accommodate over 160,000 vehicles per day at the interchange.

The overall Project Limits (Project Area) are shown in Figure 1. The Project Area on I-465 begins approximately 2.4 miles west of I-69 at the east end of the I-465 bridge over the White River and continues east through the I-465/I-69 interchange and south to the north end of the I-465 bridge over Fall Creek Road which is approximately 2.15 miles south of the I-465/I-69 interchange. The Project Area on Binford Boulevard begins approximately 2,000 feet south of 75th Street and continues north to I-69. The Project Area on I-69 begins just north of I-465 and continues north to a location where the proposed lanes tie into the existing lanes between 82nd Street and 96th Street (approximately just north of 86th Street). The I-465/I-69 interchange will be modified to improve capacity and safety. The interchange ramps at I-465/Allisonville Road and I-69/82nd Street will be modified to accommodate added travel lanes on I-465 and I-69.

1.3 PROJECT PURPOSE AND NEED

The need for the Clear Path 465 project stems from insufficient capacity that causes backups during the peak hours and safety concerns due to a high volume of crashes within the Project Area.

1. Congestion. There is insufficient existing and future capacity in critical roadway segments of the Project Area, resulting in congestion issues. Without improvements, the entire Project Area is projected to operate at unacceptable levels of service (LOS) for both base-year and design-year traffic in each direction along critical roadway segments within the project corridor.
2. Safety. Between 2013 and 2015, over 1,000 crashes were reported within the Project Area – an average of almost one crash per day. Contributing factors include traffic congestion, configuration, and weaving movements.

The purpose of the Clear Path 465 Project is to improve overall traffic operation by increasing capacity to meet the LOS goals stated above, and to improve safety by reducing the total number of crashes, decreasing the fatality/injury severity percentages, and reducing the crash rate (crashes/mile/year) and travel crash rate (crashes/million-vehicle-miles).



Figure 1: Clear Path 465 Project Limits

2.0 Methodology

2.1 FUNDAMENTALS OF TRAFFIC NOISE

The human ear perceives noise as a form of vibration that causes pressure variations. The ear is sensitive to this variation and perceives it as sound. The intensity of these pressure variations causes the ear to discern different levels of loudness. These pressure differences are commonly measured in decibels (dB).

The dB scale that is audible to the human ear spans about 140 dB. A dB level of zero is barely audible to the human ear while 140 dB is an unrecognizable sound which is painful to the listener. The decibel scale is a logarithmic representation of the actual sound pressure variation. This means that a 26 percent change in energy level only changes the sound level 1 dB. It would be possible for the human ear to detect this difference only in a laboratory. Increasing the energy level 100 percent would result in a 3 dB increase, which would be barely perceptible outdoors. A tripling in sound energy level would result in a clearly noticeable change of 5 dB in the sound level. An increase of ten times the energy level would result in a 10 dB increase in the sound level, which would be perceived as a doubling of the sound level.

The human ear has a non-linear sensitivity to noise. To account for this in noise measurement, electronic weighting scales are used to define the relative loudness of different frequencies. The “A” weighting scale, expressed as dB(A), is widely used in environmental work because it most nearly matches the nonlinear nature of human hearing.

The measurement that is most commonly used to express dB(A) levels for traffic noise is the Hourly Equivalent Sound Level [$L_{eq}(h)$]. The $L_{eq}(h)$ describes a noise sensitive receptor’s cumulative exposure from all noise-producing events over a 1-hour period.

Traffic noise studies for road projects in Indiana are performed in accordance with 23 CFR 772 and INDOT’s Traffic Noise Analysis Procedure. There are five main steps comprising traffic noise studies:

1. Identify noise sensitive receptors,
2. Determine existing ambient peak noise levels,
3. Predict future peak noise levels,
4. Identify traffic noise impacts, and
5. Evaluate mitigation measures for sensitive receptors where traffic noise impacts occur.

Noise levels were predicted for the outdoor human activity areas at each sensitive receptor using the worst traffic conditions likely to occur on a regular basis during the design year. Future noise levels predicted for the Project Area are included on Table C in Appendix C.

2.2 METHODS FOR IDENTIFYING LAND USES AND SELECTING NOISE MEASUREMENT AND MODELING LOCATIONS

A field investigation was conducted to identify land uses that could be subject to traffic and construction noise impacts from the proposed project. Land uses in the Project Area were categorized by land use type, Activity Category as defined in Table 1, and the extent of frequent human use. Although all developed land uses are evaluated in this analysis, the focus is on locations of frequent human use that would benefit from a lowered noise level. Accordingly, this impact analysis focuses on locations with defined outdoor activity areas, such as residential backyards and common use areas at recreational facilities.



Table 1: Noise Abatement Criteria in 23 CFR 772

ACTIVITY CATEGORY	$L_{eq}(h)$	EVALUATION LOCATION	ACTIVITY DESCRIPTION
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 the area is to continue to serve its intended purpose.
B	67	Exterior	Residential.
C	67	Exterior	Active sport areas, amphitheatres, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structure, radio stations, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structure, radio studios, recording studios, schools, and television studios.
E	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D, or F.
F	–	–	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	–	–	Undeveloped lands that are not permitted.

Source: 23 CFR 772

2.3 TRAFFIC NOISE LEVEL PREDICTION METHODS

Traffic noise levels were predicted using FHWA TNM 2.5. Traffic noise was evaluated under design year conditions for the build alternative. The loudest hour traffic volumes, vehicle classification percentages, and traffic speeds under design-year (2040) conditions were developed for input into the traffic noise model. The loudest hour is generally characterized by free-flowing traffic at the highway design speed (i.e., Level of Service [LOS] C or better). Since most of the Project Area is projected to operate at LOS C or worse, LOS C traffic was predominantly used in the TNM modeling for this project. Hourly traffic volumes used in this study were taken from the Clear Path Interchange Access Document (Appendix F).

2.4 METHODS FOR IDENTIFYING TRAFFIC NOISE IMPACTS AND CONSIDERATION OF ABATEMENT

According to the INDOT Traffic Noise Analysis Procedure, a traffic noise impact occurs when either of the following conditions results at a sensitive receptor:

- The future predicted $L_{eq}(h)$ noise level either approaches (is within 1 dB(A)) or exceeds the Noise Abatement Criteria (NAC) shown in Table 1.
- The future predicted $L_{eq}(h)$ noise level substantially exceeds (by 15 or more dB(A)) the existing $L_{eq}(h)$ noise level. Traffic-generated noise level increases of 15 dB(A) or more are typically associated with roadway improvements on a new alignment.

Where traffic noise impacts are identified, noise abatement must be considered for reasonableness and feasibility as required by 23 CFR 772 and the INDOT Traffic Noise Analysis Procedure. Details of this evaluation are provided in Section 4.2.



3.0 Existing Noise Environment

3.1 EXISTING LAND USES

Field investigations were conducted on July 17, 18, and 19, 2018 to identify land uses that could be subject to traffic and construction noise impacts from the proposed project. Single-family residences, apartments, assisted living facilities, commercial/retail, office, light industrial, schools, recreational areas, and athletic fields were identified as Activity Category B, C, D, E, F, and G land uses in the project area.

Noise levels were predicted at Activity Category B, C, D, and E land uses. Areas of frequent outdoor human activity were identified for the Category B, C, and E uses, and noise levels were predicted at these areas. Activity Category D land uses are areas such as medical facilities, radio studios, and schools where there is no outdoor human use or if there is outdoor human use and external noise abatement measures such as noise barriers are not found to be feasible and reasonable. For these land use areas, interior noise levels were predicted in accordance with FHWA guidance. For the majority of this project, one receptor was modeled for a single corresponding dwelling unit or area of frequent outdoor use at single-family residences, commercial/retail, and office land uses. At apartment complexes and assisted living facilities, one receptor typically represents several dwelling units.

For parks and trails, the INDOT Traffic Noise Analysis Procedure includes a separate algorithm to translate usage data into an appropriate number of receptors. This formula is based on converting total usage to equivalent residential units. The number of average daily users is divided by the average number of people per household in Indiana (i.e., 2.52). Table 2 lists the number of receptors assigned to parks and trails.

Table 2: Number of Receptors for Parks and Trails

LAND USE	NUMBER OF DAILY USERS	PERCENTAGE OF FACILITY WITHIN STUDY AREA	NUMBER OF RECEPTORS
71 st Street Trail	33	39	6
Skiles Test Nature Park	117	44	21

For the institutional land uses in the project area (i.e., schools and churches), the number of receptors assigned was determined by using the FHWA lot-sized based methodology. Under this methodology, the number of receptors was calculated by dividing the size of the parcel within the noise study area by the average single-family lot size in the project area. Table 3 lists the number of receptors assigned to these institutional land uses.

Table 3: Number of Receptors for Institutional Land Uses

LAND USE	PARCEL SIZE WITHIN STUDY AREA	AVERAGE SINGLE-FAMILY LOT SIZE	NUMBER OF RECEPTORS
Castleton United Methodist Church	284,570	23,000	13
Skiles Test Elementary School	467,472	23,000	21
Heritage Christian School	663,322	23,000	29

3.2 COMMON NOISE ENVIRONMENT (CNE) DESCRIPTIONS

Land uses in the project area have been grouped into a series of numbered Common Noise Environments (CNE) that are identified on exhibits provided in Appendix A.

- CNE 1 is located on the east side of I-69, north of 82nd Street. The area consists of two assisted living facilities and an apartment complex (Activity Category B).
- CNE 2 is located on the east side of I-69, north of 82nd Street. The area includes one hotel (Activity Category E).
- CNE 3 is located on the west side of I-69, north of 82nd Street. The area consists of one hotel and one restaurant with an outdoor eating area (Activity Category E).



- CNE 4 is located on the west side of I-69, north of 82nd Street. The area consists of two single-family residences (Activity Category B).
- CNE 5 is located on the east side of I-69, south of 82nd Street. The area consists of two hotels (Activity Category E).
- CNE 6 is located on the east side of I-69, south of 82nd Street. The area consists of an assisted living facility (Activity Category B).
- CNE 7 is located on the east side of I-69, south of 82nd Street. The area consists of a medical office building with an outdoor seating area (Activity Category E).
- CNE 8 is located north of 75th Street, along the I-465 northbound to I-69 northbound ramp. The area consists of an apartment complex (Activity Category B).
- CNE 9 is located on the west side of I-69, south of 82nd Street. The area consists of hotels and office buildings (Activity Category E).
- CNE 10 is located on the north side of I-465, west of Allisonville Road. The area consists of an apartment complex (Activity Category B).
- CNE 11 is located on the south side of I-465, west of Allisonville Road. The area consists of office land use (Activity Category E).
- CNE 12 is located on the north side of I-465, east of Allisonville Road. The area consists of office land use (Activity Category E).
- CNE 13 is located on the south side of I-465, east of Allisonville Road. The area consists of single- and multi-family residences (Activity Category B).
- CNE 14 is located south of the I-465/I-69 interchange and north of 75th Street. The area consists of office and commercial land uses (Activity Category E).
- CNE 15 is located on the west side of I-465, south of 75th Street. The area consists of single-family residential uses (Activity Category B). There is an existing noise barrier located along southbound I-465 through this area.
- CNE 16 is located on the west side of I-465, south of 75th Street. The area consists of Skiles Test Elementary School and Skiles Test Park (Activity Category C). The school and the north portion of Skiles Test Park are located behind the existing noise barrier along southbound I-465.
- CNE 17 is located along the east side of I-465, south of 75th Street. The area consists of a day care center and a church (Activity Category C).
- CNE 18 is located along the east side of I-465, south of 75th Street. The area consists of offices (Activity Category E).
- CNE 19 is located along the east side of I-465, south of 75th Street, and east of Shadeland Avenue. The area consists of single-family residences (Activity Category B).
- CNE 20 is located along the east side of Binford Boulevard, south of 75th Street. The area consists of Heritage Christian School (Activity Category C).
- CNE 21 is located along the east side of Binford Boulevard, south of 75th Street. The area consists of single-family residences (Activity Category B).

3.3 NOISE SENSITIVE RECEPTORS AND EXISTING NOISE CONDITIONS

Noise sensitive receptors are those locations where activities that could be affected by increased traffic noise levels occur (e.g., residences, motels/hotels, churches, schools, parks, and libraries). Existing noise levels are determined for the most commonly used outdoor living areas at sensitive receptors. For residences, this is typically the backyard or front porch, and for commercial areas it could be a picnic table or bench.

Over 500 receivers were evaluated to represent approximately 1,500 residential units and other noise sensitive uses in the Project Area for analysis as part of the noise study (Appendix A). These receptors include Activity Category B, C, D, and E land uses.



3.4 MEASUREMENT PROCEDURES, EQUIPMENT, AND RESULTS

Noise level measurements were taken within each CNE. The measurements were conducted using a Larson-Davis SoundExpert LxT sound meter. Measurements were taken at 24 locations, each for a 15-minute period. Calibration of the meter was checked before and after field work using a Larson-Davis Model Cal 200 calibrator. When the measurements were taken, meteorological conditions were within the manufacturer’s recommended guidelines. Noise measurement field sheets and a figure that identifies the noise measurement locations are included in Appendix E. The noise level measurements were taken on July 17 and 18, 2018. Temperatures ranged from 59 to 89 degrees. Wind speeds were 3 to 11 miles per hour, and the skies were typically sunny to partly sunny.

Table 4 summarizes the results of the existing noise measurements taken.

Traffic-generated hourly equivalent noise levels [Leq(h)] were predicted using FHWA TNM 2.5, a highway traffic noise prediction model. The model takes into account traffic volumes, vehicle types, vehicle speeds, roadway geometry, and sensitive receptor locations to calculate traffic-generated noise levels. As shown in Table 4, comparing the modeled and measured noise levels using observed traffic counts confirms the applicability of the model to the study area. Predicted traffic noise levels using the traffic counts observed during the measurements are within +/- 3 dB(A) of the measured levels, indicating reasonable correlation. Therefore, this model is validated per 23 CFR 722.11 (d)(2), and no modifications to the model were needed.

Table 4: Comparison of Measured to Predicted Sound Levels in the TNM Model

CNE	ACTIVITY CATEGORY	MEASUREMENT ID	DURATION (MINUTES)	MEASURED Leq(h)	PREDICTED SOUND LEVEL [dB(A)]	MEASURED MINUS PREDICTED [dB(A)]
1	B	2798_v1879	15	73.7	72.2	1.5
2	E	1054_v2077	15	66.5	65.6	0.9
3	E	1055_v2078	15	60.8	63.5	-2.7
4	B	1057_v2079	15	58.7	61.2	-2.5
5	E	1059_v2082	15	66.1	64.0	2.1
6	B	2804_v2083	15	72.0	71.5	0.5
7	E	1060_v2083	15	66.0	67.1	-1.1
8	B	1061_v2084	15	69.3	71.6	-2.3
9	E	1058_v2081	15	62.8	65.5	-2.7
10	B	1066_v2089	15	65.9	68.4	-2.5
11	E	2810_v2089	15	59.4	58.8	0.6
12	E	2811_v2090	15	69.5	70.2	-0.7
13	B	1067_v2090	15	69.7	72.5	-2.8
14	E	1068_v2091	15	60.1	60.9	-0.8
15	B	1062_v2085	15	57.1	60.1	-3.0
15	B	1064_v2087	15	59.5	62.2	-2.7
16	C	1063_v2086	15	58.7	61.4	-2.7
16	C	2808_v2087	15	59.2	57.9	1.3
17	C	2806_v2085	15	73.4	70.6	2.8
18	E	1065_v2088	15	75.0	73.3	1.7
18	E	2805_v2084	15	67.3	66.2	1.1
19	B	2807_v2086	15	64.4	67.3	-2.9
20	C	2815_v2092	15	54.1	51.6	2.5
21	B	1071_v2092	15	56.1	56.2	-0.1

4.0 Future Noise Environment, Impacts, and Abatement

4.1 FUTURE NOISE ENVIRONMENT AND IMPACTS

Table C in Appendix C summarizes the traffic noise modeling results for existing and design-year conditions with and without noise barriers. Results tables from TNM are provided in Appendix G. As described in Section 2.3, these predictions utilize forecasted design hour traffic conditions to ensure a conservative estimate of noise levels for the loudest noise hour. The comparison to existing conditions is included in the analysis to identify traffic noise impacts under 23 CFR 772.

Existing noise levels range from 55 to 77 dB(A). Under the build conditions, the predicted noise levels range from 55 to 78 dB(A). Noise impacts were identified in 13 of the 21 CNEs evaluated, including approximately 1,200 receptors that included land use Categories B, C, and E. All noise impacts are a result of the predicted noise level approaching or exceeding the NAC. Predicted noise level increases under the build conditions typically range up to 3 dB(A). No predicted noise level increases exceed 15 dB(A).

The results shown in Appendix C indicate that predicted traffic noise levels for the design-year with project conditions approach or exceed the NAC. Therefore, traffic noise impacts are predicted to occur within the project area, and noise abatement must be considered. A discussion of the noise abatement analysis is provided in the following section.

4.2 NOISE ABATEMENT ANALYSIS

In accordance with 23 CFR 772, noise abatement is considered where noise impacts are predicted in areas of frequent human use that would benefit from a lowered noise level. Potential noise abatement measures include the following:

- Avoiding the impact by using design alternatives, such as altering the horizontal and vertical;
- Realignment of the project;
- Construction of noise barriers;
- Acquiring property to serve as a buffer zone;
- Using traffic management measures to regulate types of vehicles and speeds; and
- Acoustically insulating public-use or nonprofit institutional structures.

Major alteration of the roadway geometry that would have a substantial effect on predicted noise levels is not feasible. The preferred alternative has been developed to best meet the transportation need of the corridor while minimizing impacts to the immediate area and meeting the purpose of the project. Horizontal geometry changes significant enough to affect noise levels would require numerous relocations and is not a practical alternative. Similarly, changes to the vertical geometry that would significantly affect noise levels are not practical through the project area. Thus, any changes to these alignments would be limited and have only minimal effects on sound levels.

Noise barriers placed along roadways on state-owned right-of way can effectively shield locations from traffic-related noise. A barrier's feasibility is based on its acoustic effectiveness, which depends on the area's geometry, the barrier's configuration, and the effects of other (unblocked) noise sources. Noise barriers were evaluated, and the results are described below.

Vacant or undeveloped property may be acquired to provide a buffer zone from noise generating facilities. However, there is no vacant land in the study area that, if acquired, would provide effective abatement as a buffer zone.



Traffic management measures would not be effective for this project. Traffic management measures that could reduce sound levels include “traffic calming” actions, such as reducing volumes, especially truck volumes, or travel speeds. Such measures are not consistent with the transportation needs in the area or purpose of the project.

Insulation of public structures, nonprofit institutions, and other Category D land uses is not applicable, since there are no public-use or nonprofit institutional structures impacted by the project. Interior noise levels at public-use, nonprofit institutional structures, and other Category D land uses are not anticipated to be above interior NAC levels. A summary of the predicted interior noise levels is provided later in Section 4.2.3, Table 6.

All of these abatement options have been considered. However, because of the configuration and location of the project, noise barriers are the only abatement suited for this project.

4.2.1 FEASIBILITY OF ABATEMENT

INDOT considers engineering feasibility and acoustic feasibility when determining if noise abatement is feasible. INDOT requires noise abatement measures to be based on sound engineering practices and standards and requires that any measures be evaluated at the optimum location. For instances in which the roadway is located on fill and is at a higher location than nearby receptors, a barrier will be evaluated near the shoulder. For instances in which the roadway is located below the nearby receptors, a barrier will be evaluated near the edge of the right-of-way near the receptors. Engineering feasibility also takes into account topography, drainage, safety, barrier height, utilities, and access/maintenance needs (which may include right-of-way considerations).

In terms of acoustic feasibility, INDOT requires that noise barriers achieve a 5 dB(A) reduction at a majority (greater than 50%) of the impacted receptors. If a barrier cannot achieve this acoustic goal, abatement is considered to not be acoustically feasible.

4.2.2 REASONABLENESS OF ABATEMENT

Reasonable means that INDOT believes abatement of traffic noise impacts is prudent based on consideration of the following factors:

1. Consideration and Obtaining Views of Residents and Property Owners
The following steps will be taken to solicit public input on recommended noise barriers.

A survey will be mailed to each benefited resident. If the property owner is different from the current resident, both the resident and the property owners are surveyed. The concerns and opinions of the property owner and the unit occupants will be balanced with other considerations in determining whether a barrier is appropriate for a given location. This survey will include a pre-stamped, self-addressed return postcard, a brief project description of the project and barrier locations under consideration. It will also include a pamphlet on the basics of traffic noise. The decision-making process and pertinent information on the upcoming Noise Public Meeting will be provided. The survey can be returned via mail or returned in person at the Noise Public Meeting. All responses expressing opinions for or against barriers must be expressed in writing to INDOT, by letter, email or the response postcard. Extra surveys will be available at the hearing if any are lost or misplaced.

Consideration of noise barriers can cause conflicts in mixed-use developments, as barriers to protect residences may block line of sight to adjacent businesses. If a barrier is proposed directly adjacent to the property line of a business, the business will be solicited for input to determine whether they have any concerns about line of sight. If a mutually satisfactory compromise cannot be reached between business(es) and residences, barriers may be terminated at the property line dividing the two areas. These conflicts can be minimized by noise-compatible planning.



2. Cost-effectiveness

To determine cost-effectiveness, the estimated cost of constructing a noise barrier (including installation and additional necessary construction such as foundations or guardrail) will be divided among the number of benefited receptors (those who would receive a reduction of at least 5 dB(A)). A cost of \$25,000 or less per benefited receptor is considered to be “cost-effective”. Development in which a majority (more than 50%) of the receptors was in place prior to initial construction of the roadway in its current state (functional classification) will receive additional consideration for noise abatement. The cost-effectiveness criteria to be used for these cases will be 20% greater (currently \$30,000 per benefited receptor).

Placing noise barriers on structures creates additional challenges, since reinforcement of the structure may be necessary to support the increased load. In these situations, other options should be assessed to determine whether cost-effective abatement can be provided without requiring complicated and expensive structural modifications. These could include lighter-weight barriers, shorter barriers, or other considerations. Any variations will be worked out in coordination between the FHWA division office and INDOT’s Offices of Structural Services, Environmental Services and Construction Management.

3. INDOT Design Goal For Noise Abatement

INDOT’s goal for substantial noise reduction is to provide at least a 7 dB(A) reduction for benefited first row receptors in the design year. However, conflicts with adjacent lands may make it impossible to achieve substantial noise reduction at all impacted first row receptors. Therefore, the noise reduction design goal for INDOT is 7 dB(A) for a majority (greater than 50%) of the impacted first row receptors.

4.2.3 PROJECT NOISE BARRIER ANALYSIS

Nine noise barriers were analyzed for this project prior to the December 2018 public meeting. Each noise barrier was evaluated for feasibility based on achievable noise reduction and engineering considerations. All nine noise barriers were considered feasible. Reasonableness criteria were then evaluated for each of the nine noise barriers. Of the nine noise barriers analyzed along the project, all nine met INDOT’s design goal for noise abatement, and six met INDOT’s cost-effective criterion.

The location of each of the noise barriers evaluated is summarized below:

- Noise Barrier 1: East side of I-69, north of 82nd Street
- Noise Barrier 2: East side of I-69, south of 82nd Street
- Noise Barrier 3: North of 75th Street along I-465 northbound to I-69 northbound ramp
- Noise Barrier 4: North side of I-465, west of Allisonville Road
- Noise Barrier 5: North side of I-465, east of Allisonville Road
- Noise Barrier 6: South side of I-465, east of Allisonville Road
- Noise Barrier 7: West side of I-465, south of 75th Street
- Noise Barrier 8: East side of I-465, south of 75th Street
- Noise Barrier 9: East side of Binford Boulevard, south of 75th Street.

Table 5 summarizes the barriers analyzed for this project prior to the December 2018 public meeting.

Barrier 7 is located along the west side of I-465, south of 75th Street. There is an existing noise barrier in this location. The proposed roadway improvements will require the removal of portions of the existing noise barrier. It is possible that sections of this noise barrier could be retained. This will be explored further as the project design continues.



Consideration and Obtaining Views of Residents and Property Owners

The results in Table 5 were coordinated with the benefited residents and property owners. Results of this coordination are summarized in Section 5.0.

Table 5: Analyzed Noise Barriers Prior to Public Involvement

NOISE BARRIER	TOTAL LENGTH (FT)	AVERAGE HEIGHT (FT)	ESTIMATED COST PER BENEFITED RECEPTOR	COST-EFFECTIVENESS CRITERION PER BENEFITED RECEPTOR*
1	1,900	14.4	\$5,707	\$25,000
2	1,250	17.1	\$7,629	\$25,000
3	1,600	16.0	\$8,495	\$25,000
4	2,460	16.0	\$4,764	\$25,000
5	3,629	14.0	\$381,008	\$25,000
6	5,500	15.1	\$10,501	\$25,000
7	5,600	13.9	\$22,941	\$30,000
8	7,600	16.0	\$96,000	\$30,000
9	1,400	12.0	\$62,996	\$25,000

Analysis of Interior Noise Levels

Interior noise levels were calculated for Activity Category D land uses (e.g., medical facilities, radio studios, and schools) where there is no outdoor human use or where there is outdoor human use and external noise abatement measures were not found to be feasible and reasonable. According to FHWA guidance, interior noise level predictions are computed by subtracting from the predicted exterior levels the noise reduction factors for the building in question. For this project, a noise reduction factor of 25 dB(A) was used to account for masonry building type and single-glazed windows. Table 6 lists the predicted interior noise levels for the build alternative. No noise impacts were identified.

Table 6: Predicted Interior Noise Levels

RECEPTOR	LAND USE	PREDICTED INTERIOR NOISE LEVEL (dBA)	IMPACT
D15	Family Beginnings (8435 Clearvista)	47	No
D16	The Gillian Institute (8455 Clearvista)	47	No
D29	Medical Offices (8202 Clearvista)	39	No
D30	Medical Offices (6822 E. 82 nd)	46	No
D7	Insights Consulting (7830 Johnson Road)	44	No
D26	Medical Offices (6330 E. 75 th)	45	No
D27	Medical Offices (6330 E. 75 th)	41	No
D3	KinderCare (7901 E. 75 th)	50	No
D17	Medical Offices (7440 Shadeland)	42	No
D18	Medical Offices (7430 Shadeland)	45	No
D19	Medical Offices (7301 Shadeland)	45	No
D20	Medical Offices (7207 Shadeland)	41	No
D21	Walker-Dixon Orthodontics (7205 Shadeland)	42	No
D27-2	Medical Offices (7275 Shadeland)	42	No
D28	Medical Offices (7340 Shadeland Station)	37	No



RECEPTOR	LAND USE	PREDICTED INTERIOR NOISE LEVEL (dBA)	IMPACT
D31	Indianapolis Dental Assistant School (7265 Shadeland)	39	No

Note: Noise Abatement Criterion is 52 dB(A). Exterior noise level was reduced by 25 dB(A) to represent interior noise level at Category D land uses.



5.0 Public Involvement

The public involvement process for the original noise analysis consisted of a letter and survey along with a public meeting. The first mailing was sent on December 5, 2018 to the noise-impacted property owners benefited by the noise barriers initially found to be both feasible and reasonable (barriers 1, 2, 3, 4, 6, and 7). The mailing consisted of a letter informing them of the noise analysis and the public meeting along with a survey postcard (Appendix H). The postcard was used to survey the current resident/property owner to determine if they want the noise barrier constructed or if they do not want it constructed. Per the INDOT noise policy, input is required from the majority of nearby property owners or the noise barriers may not be warranted. A total of 859 letters and surveys were sent in December.

A public meeting was conducted on December 17, 2018 to discuss the results of the Draft Traffic Noise Impact Analysis and potential noise barriers. At the meeting, INDOT's noise mitigation process and the proposed noise barrier locations were presented. Attendees were provided copies of the survey postcard.

Ninety responses were received from the noise-impacted property owners benefited by the noise barriers (1, 2, 3, 4, 6, and 7). Of the responses received, 81 were in support of the noise barriers being constructed. In addition, survey responses were received from other residents and property owners that did not receive the mailing and are, therefore, were not benefited by the noise barriers presented at the December 17, 2018 public meeting. The mailing package and a summary of survey responses are provided in Appendix H.

Based on the low number of responses (90 out of 859), a second letter and survey were sent to those residents and property owners that did not respond to the first survey. A total of 771 letters and surveys were sent in February 2019, and 53 responses were received. Of the responses received, 45 were in support of the noise barriers being constructed. The second mailing package and a summary of survey responses are provided in Appendix H.

Following the initial surveys, additional analysis of potential noise abatement was conducted. Part of this additional analysis included extending the noise study area from 500 to 800 feet along the east side of I-465 in the vicinity of 71st Street. This extension of the study area was done because some predicted noise impacts extend out past the 500-foot study area. As a result of this additional analysis, Noise Barrier 8 was identified as preliminarily feasible and reasonable.

An additional survey was sent to the noise-impacted property owners benefited by Noise Barrier 8 in July 2019, and a public meeting was held on August 7, 2019. Ninety-eight letters and surveys were sent, and 68 responses were received. Of the responses received, 63 (56 residences and 7 businesses) were in support of Noise Barrier 8. Five responses, all from adjacent businesses, did not support Noise Barrier 8. The mailing package and a summary of the survey responses for Noise Barrier 8 are provided in Appendix H.

Overall, a majority of respondents for each noise barrier indicated they were in favor of the proposed noise abatement. However, to address concerns from some adjacent business owners regarding the loss of visibility to their property from I-465, the length of some walls was shortened. The following summarizes the changes to the noise barrier locations based on input from adjacent property owners.

- Noise Barrier 1: Barrier 1 was shortened on the south end to maintain visibility to businesses.
- Noise Barrier 2: Barrier 2 was shortened on the north and south end to maintain visibility to businesses.
- Noise Barrier 3: Barrier 3 was shifted off the right-of-way to maintain visibility to businesses.
- Noise Barrier 4: Barrier 4 was shortened at the east end to maintain visibility to the adjacent business.
- Noise Barrier 8: As noted above, some businesses adjacent to Noise Barrier 8 do not support the proposed mitigation. However, given the nature of the development through this area (i.e., businesses fronting I-465 with residential development behind), there is no feasible way to shorten the barrier to maintain visibility to businesses while still maintaining acoustic feasibility.

Table 7 summarizes the analysis for the feasible and reasonable noise barriers. The feasible and reasonable noise barriers are shown on the figures in Appendix A.



Table 7: Feasible and Reasonable Noise Barriers

NOISE BARRIER	TOTAL LENGTH (FT)	AVERAGE HEIGHT (FT)	ESTIMATED TOTAL COST	BENEFITED RECEPTORS	ESTIMATED COST PER BENEFITED RECEPTOR	COST-EFFECTIVENESS CRITERION PER BENEFITED RECEPTOR*
1	800	12.3	\$294,000	46	\$6,391	\$25,000
2	350	14.0	\$146,430	84	\$1,743	\$25,000
3	1231	16.6	\$614,370	176	\$3,491	\$25,000
4	2000	15.2	\$912,030	288	\$3,167	\$25,000
6	5231	14.2	\$2,227,980	203	\$10,975	\$25,000
7	5500	13.9	\$2,298,070	92	\$24,990	\$30,000
8	4900	17.6	\$2,580,060	94	\$29,715	\$30,000

*Cost per benefited receptor increases to \$30,000 if the majority of the homes were built prior to initial construction of the roadway.

The noise barriers listed in Table 7 also reflect adjustments made to avoid utilities and placing noise barriers across highway bridges. The following list summarizes these changes:

- Noise Barrier 3: Adjusted at 75th Street to avoid overhead utility.
- Noise Barrier 6: Adjusted at 82nd Street to avoid overhead utility and at Hoosier Heritage Port Authority Railroad to avoid placing the barrier on the bridge over the railroad.

Future Design Revisions

If pertinent parameters change substantially during the continuing project design, the noise abatement decision may be changed or eliminated from the final project design.



6.0 Construction Noise

During construction of the project, noise from construction activities may intermittently dominate the noise environment in the immediate area of construction.

Table 8 summarizes noise levels produced by construction equipment that is commonly used on roadway construction projects. Construction equipment is expected to generate noise levels ranging from 70 to 90 dB(A) at a distance of 50 feet, and noise produced by construction equipment would be reduced over distance at a rate of approximately 6 dB(A) per doubling of distance.

Table 8: Construction Equipment Noise

EQUIPMENT	MAXIMUM NOISE LEVEL (DB(A) AT 50 FEET)
Scrapers	89
Bulldozers	85
Heavy Trucks	88
Backhoe	80
Pneumatic Tools	85
Concrete Pump	82

Source: U.S. Environmental Protection Agency 1971.

No adverse noise impacts from construction are anticipated because construction noise would be short-term and intermittent. Measures to minimize the temporary impacts will include requiring equipment to have sound-control devices that are no less effective than those provided on the original equipment and requiring all equipment to be muffled.



7.0 Conclusions and Recommendations

Based on this noise impact analysis completed for this project, seven feasible and reasonable barriers were identified for this project. These locations are summarized in Table 9.

Table 9: Recommended Feasible and Reasonable Noise Barriers

NOISE BARRIER	CNE	LOCATION	LENGTH (FEET)	NUMBER OF BENEFITED RECEPTORS
1	1	East side of I-69, north of 82nd Street	800	46
2	6	East side of I-69, south of 82nd Street	350	84
3	8	North of 75th Street along I-465 WB to I-69 NB ramp	1,231	176
4	10	North side of I-465, west of Allisonville Road	2,000	288
6	13	South side of I-465, east of Allisonville Road	5,231	203
7	15, 16	West side of I-465, south of 75th Street	5,500	92
8	17, 18, 19	East side of I-465, near 71 st Street	4,900	94

7.1 STATEMENT OF LIKELIHOOD

Based on the studies completed to date, INDOT has identified 1,212 impacted receptors within the noise study area for this project. INDOT has also determined that noise abatement is likely, but not guaranteed, at seven locations where 983 of the 1,212 impacted receptors are located. Noise abatement at these locations is based upon preliminary design costs and design criteria. Noise abatement in these locations at this time has been estimated to cost approximately \$9.1 million and will reduce the noise level by a minimum of 5 dB(A) at a majority of the identified impacted receptors. A re-evaluation of the noise analysis will occur during final design. If during final design it has been determined that conditions have changed such that noise abatement is not feasible and reasonable, the abatement measures might not be provided. The final decision on the installation of any abatement measure(s) will be made upon the completion of the project’s final design and the public involvement processes.

The viewpoints of the benefited residents and property owners will be sought and will be considered in determining the reasonableness of highway traffic noise abatement measures for proposed highway construction projects. INDOT will incorporate highway traffic noise consideration in on-going activities for public involvement in the highway program.

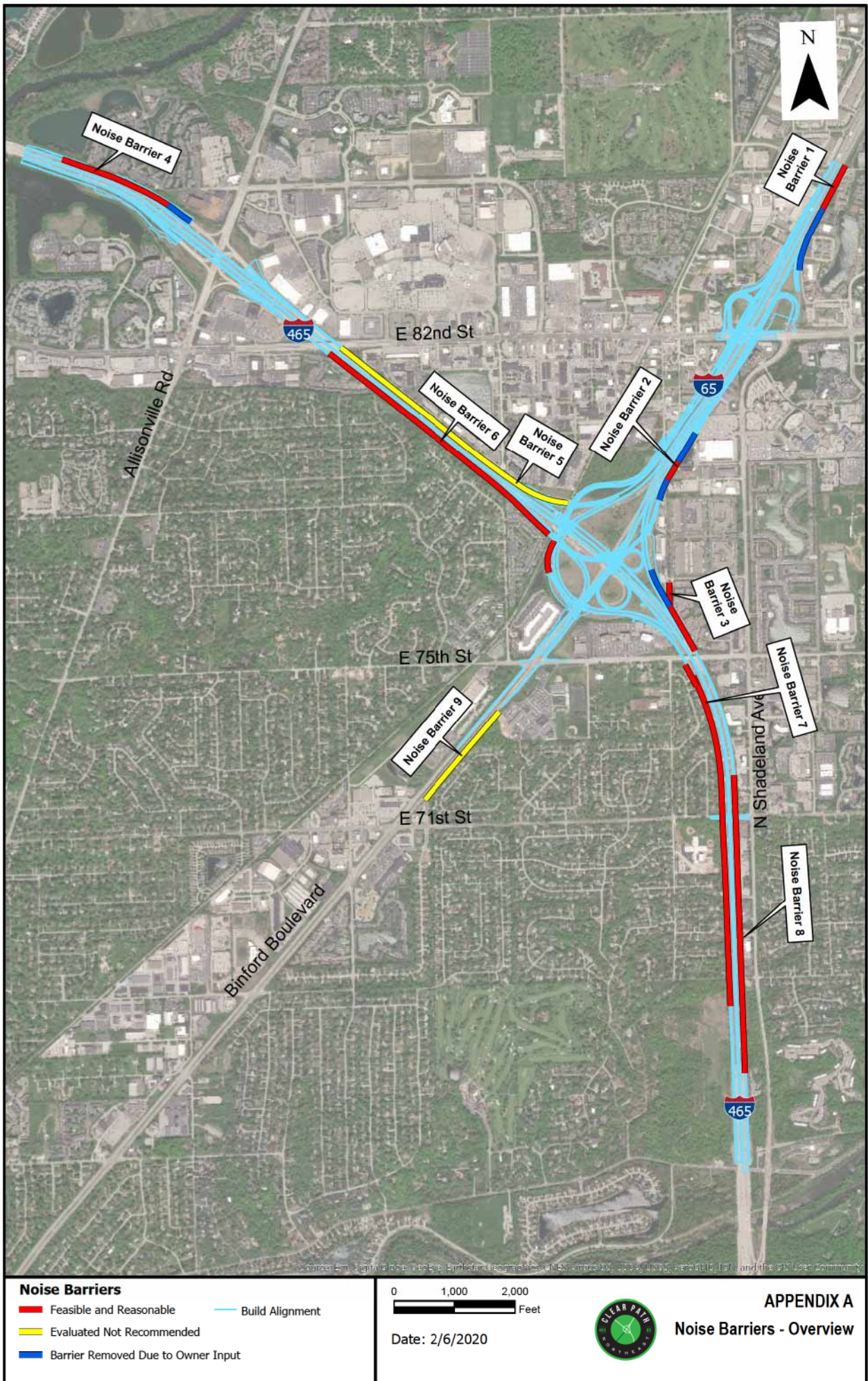


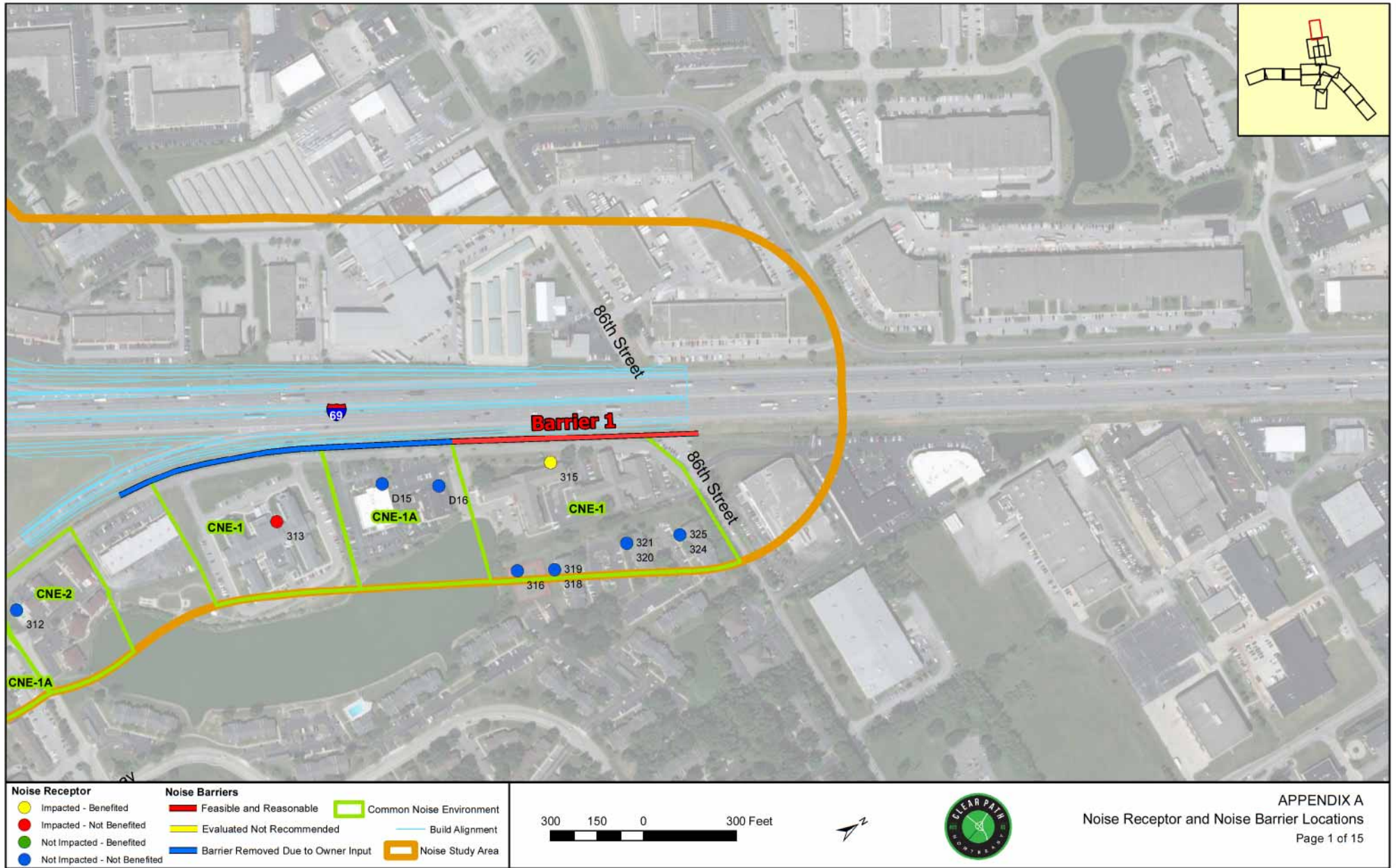
8.0 References

23 CFR 772 (2010). "Procedures for Abatement of Highway Traffic Noise and Construction Noise."
<https://www.govinfo.gov/content/pkg/FR-2010-07-13/pdf/2010-15848.pdf>

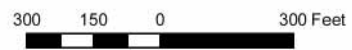
INDOT 2017. "Indiana Department of Transportation Traffic Noise Analysis Procedure," Office of Environmental Services.
<https://www.in.gov/indot/files/2017%20INDOT%20Noise%20Policy.pdf>

U.S. Environmental Protection Agency, "Noise from Construction Equipment and Operations, Building Equipment and Home Appliances," NTID300.1, December 31, 1971
http://docs.ppsmixeduse.com/ppp/DEIR_References/1971_1201_usepa_noiseconstruction.pdf

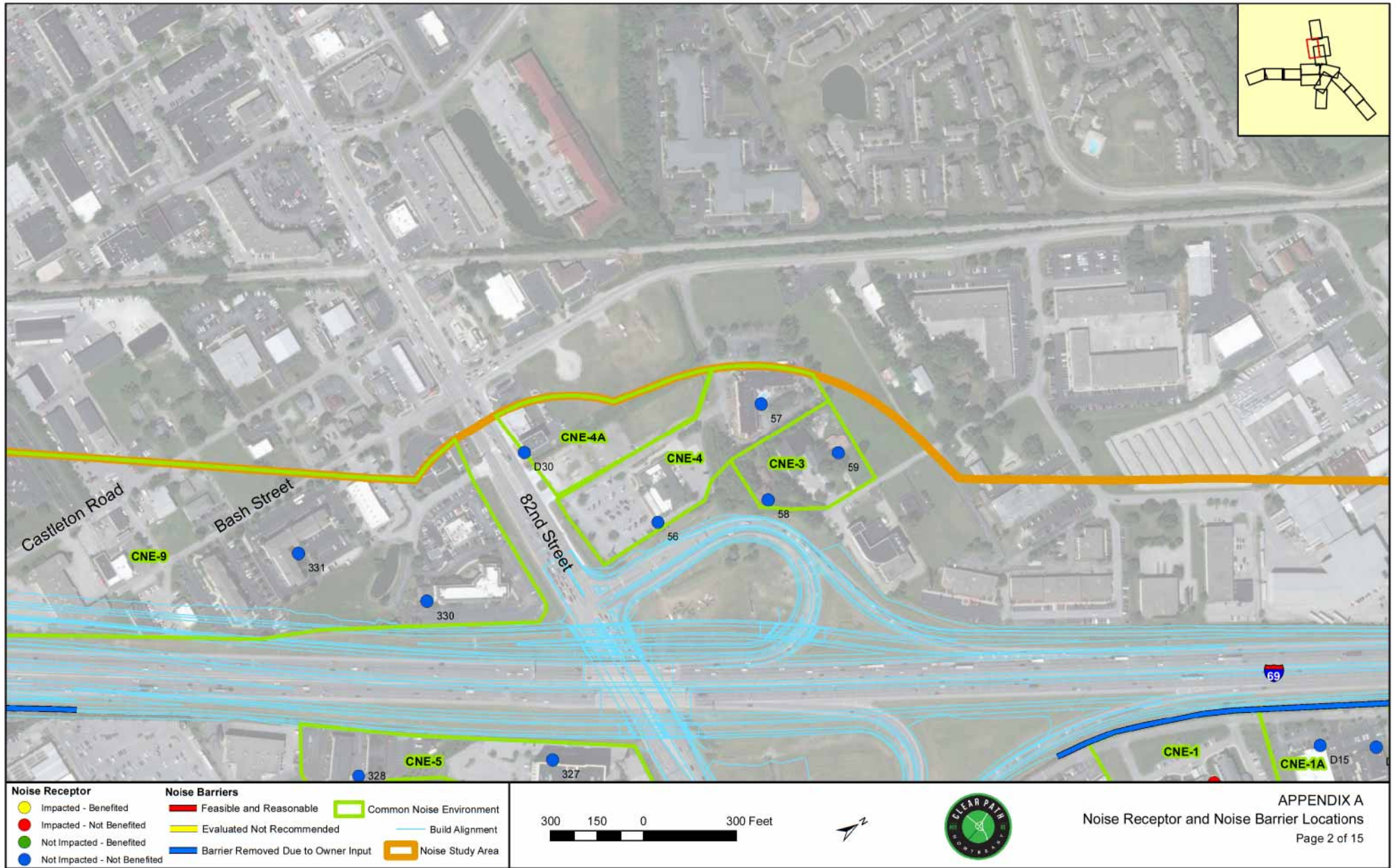


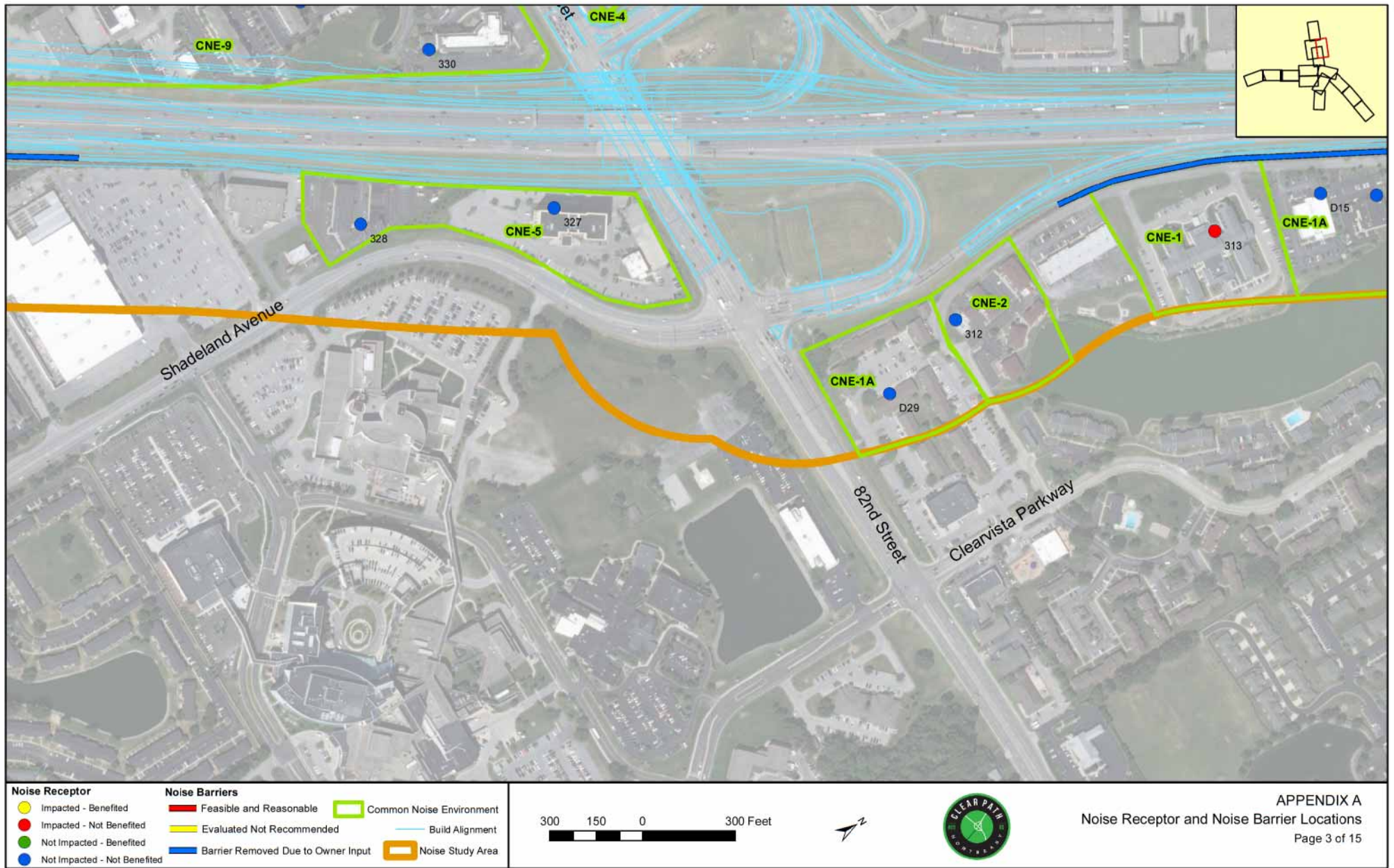


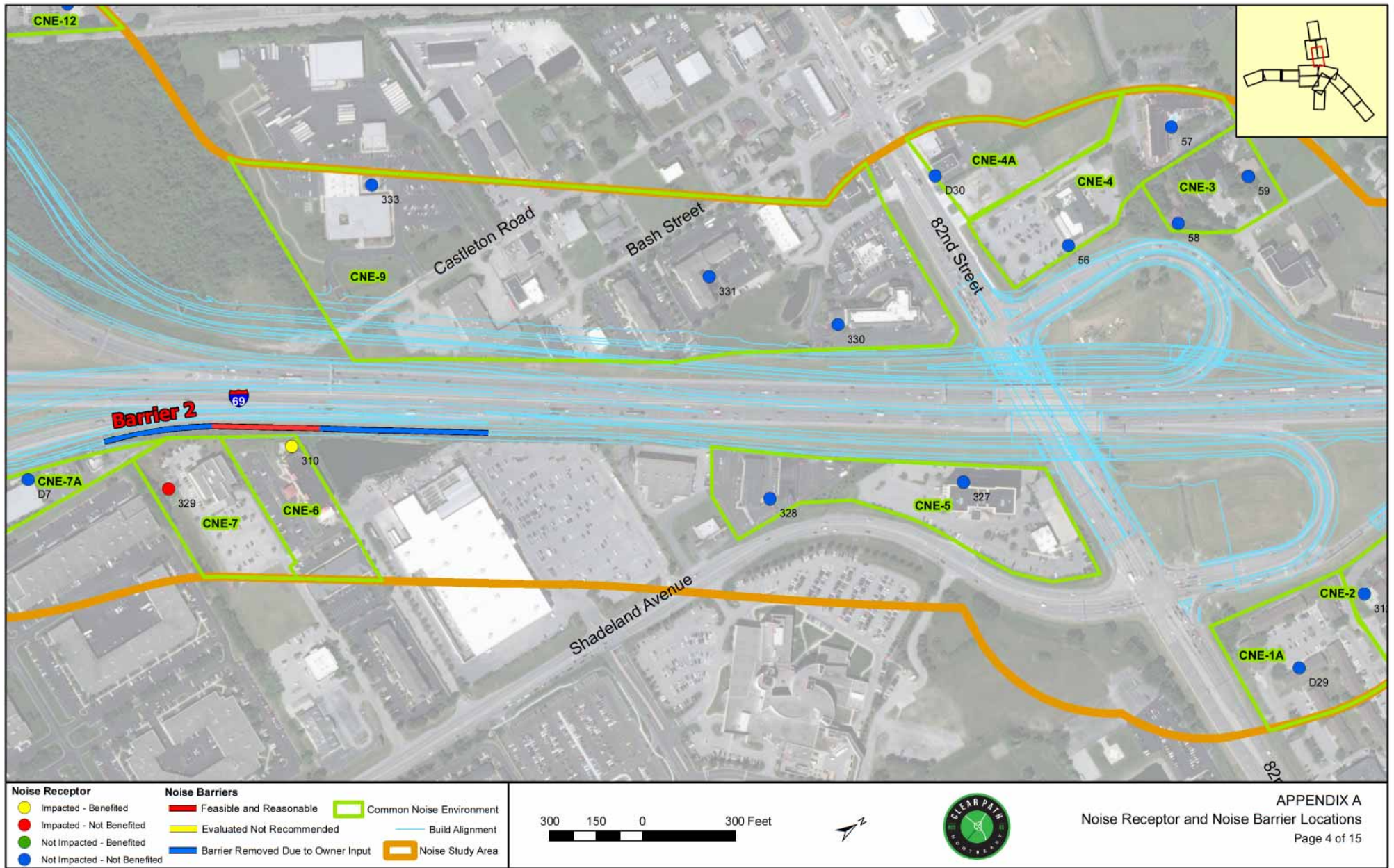
Noise Receptor	Noise Barriers	
● Impacted - Benefited	— Feasible and Reasonable	 Common Noise Environment
● Impacted - Not Benefited	— Evaluated Not Recommended	— Build Alignment
● Not Impacted - Benefited	— Barrier Removed Due to Owner Input	 Noise Study Area
● Not Impacted - Not Benefited		

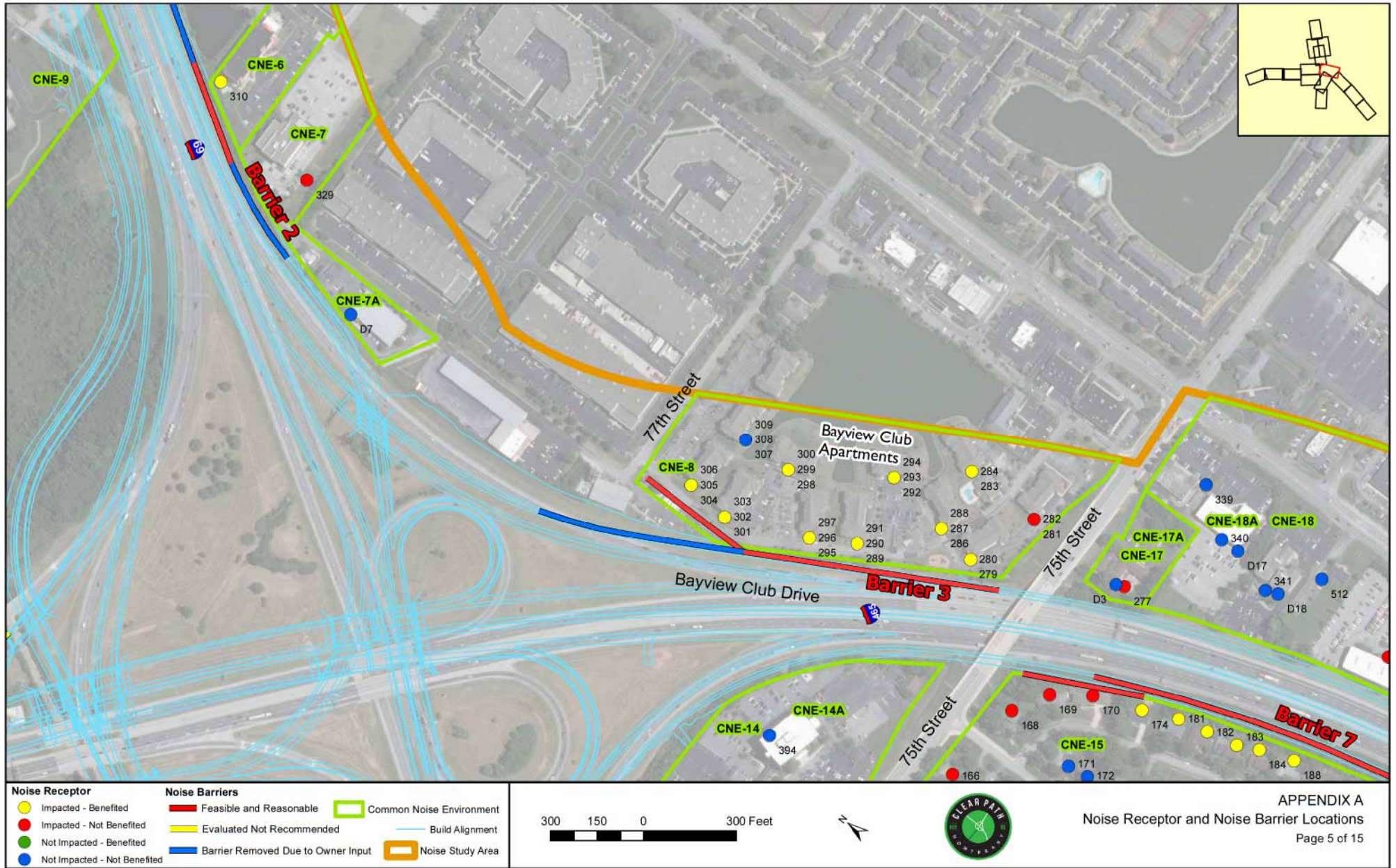


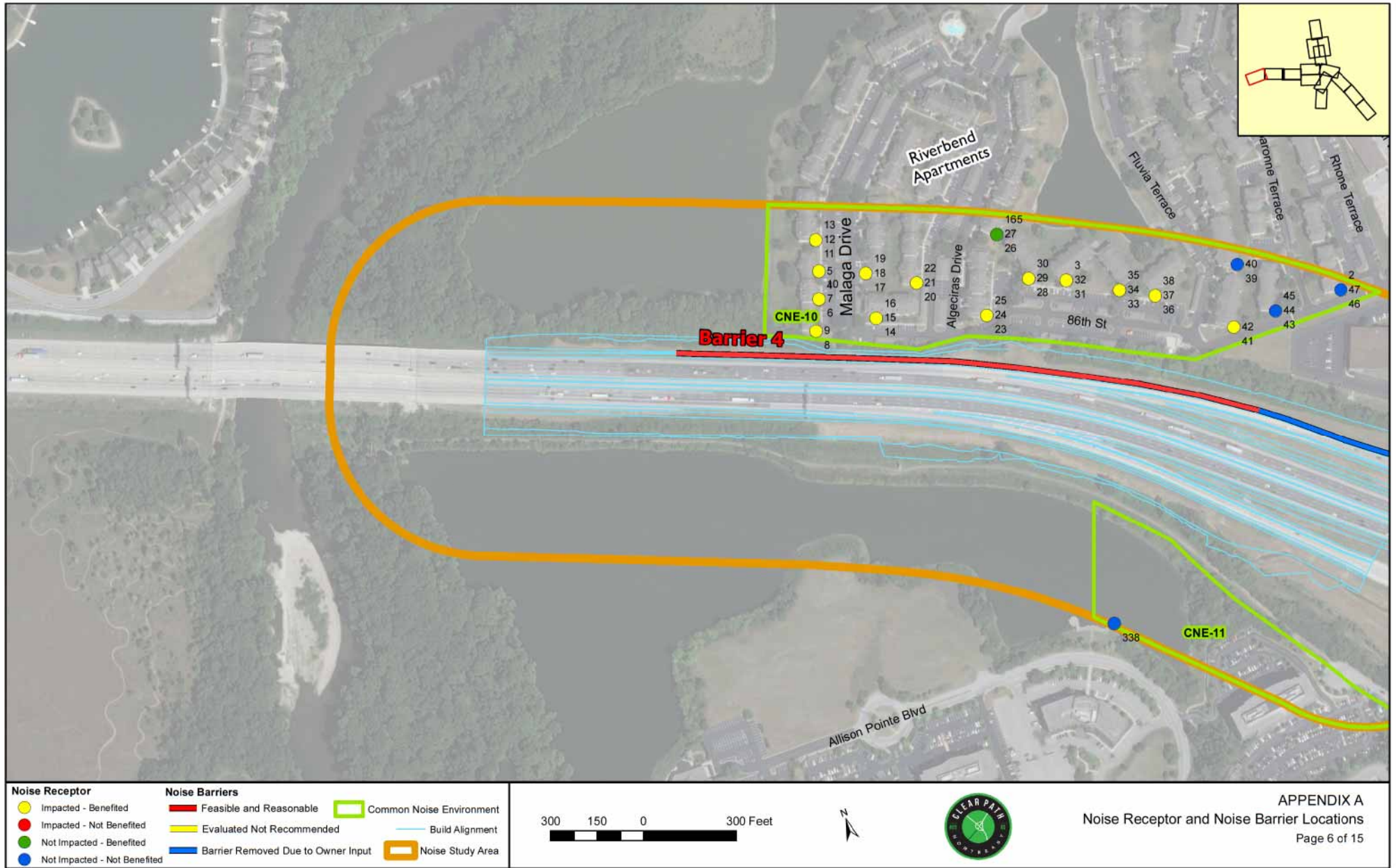
APPENDIX A
Noise Receptor and Noise Barrier Locations
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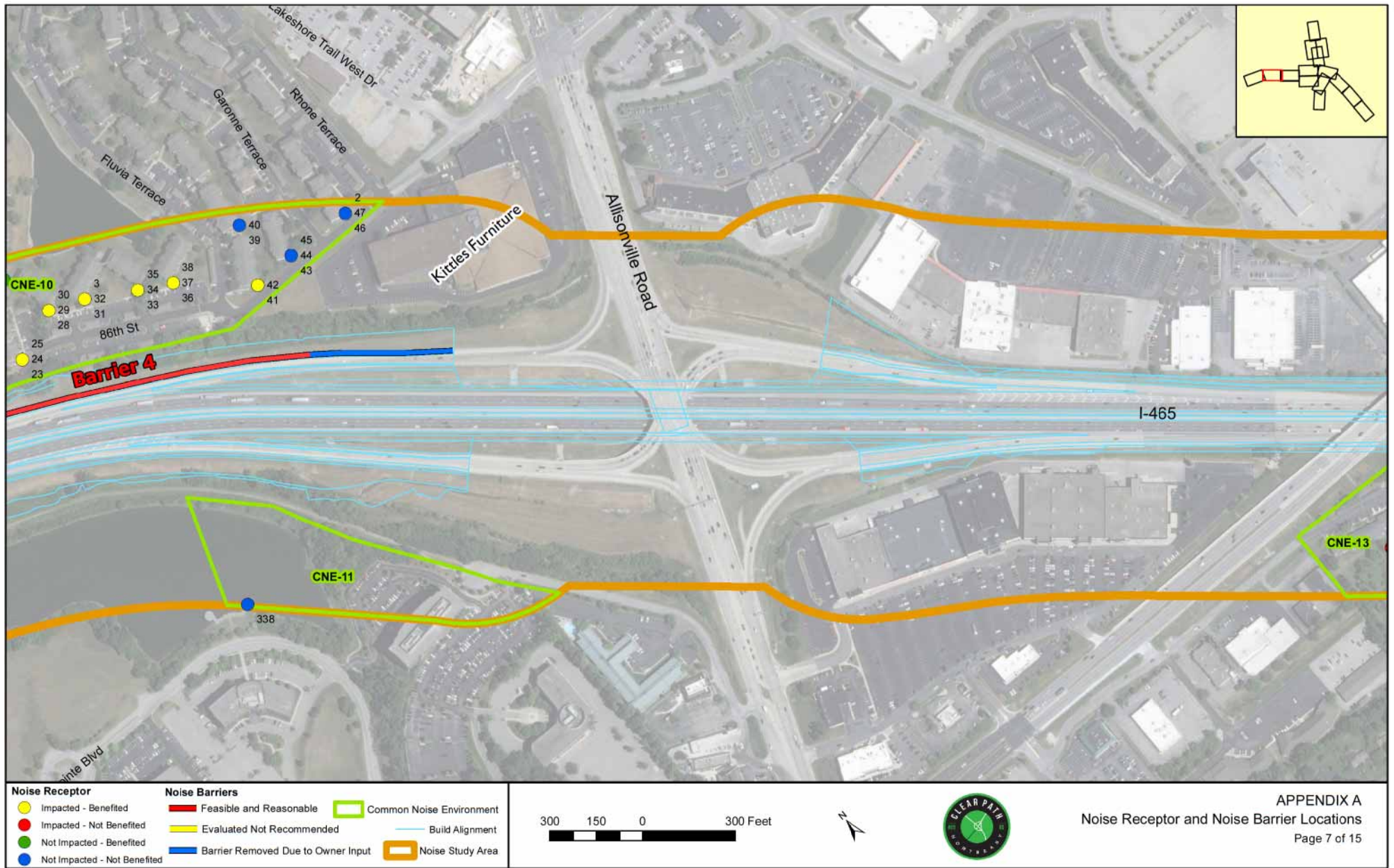




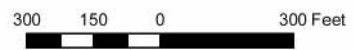




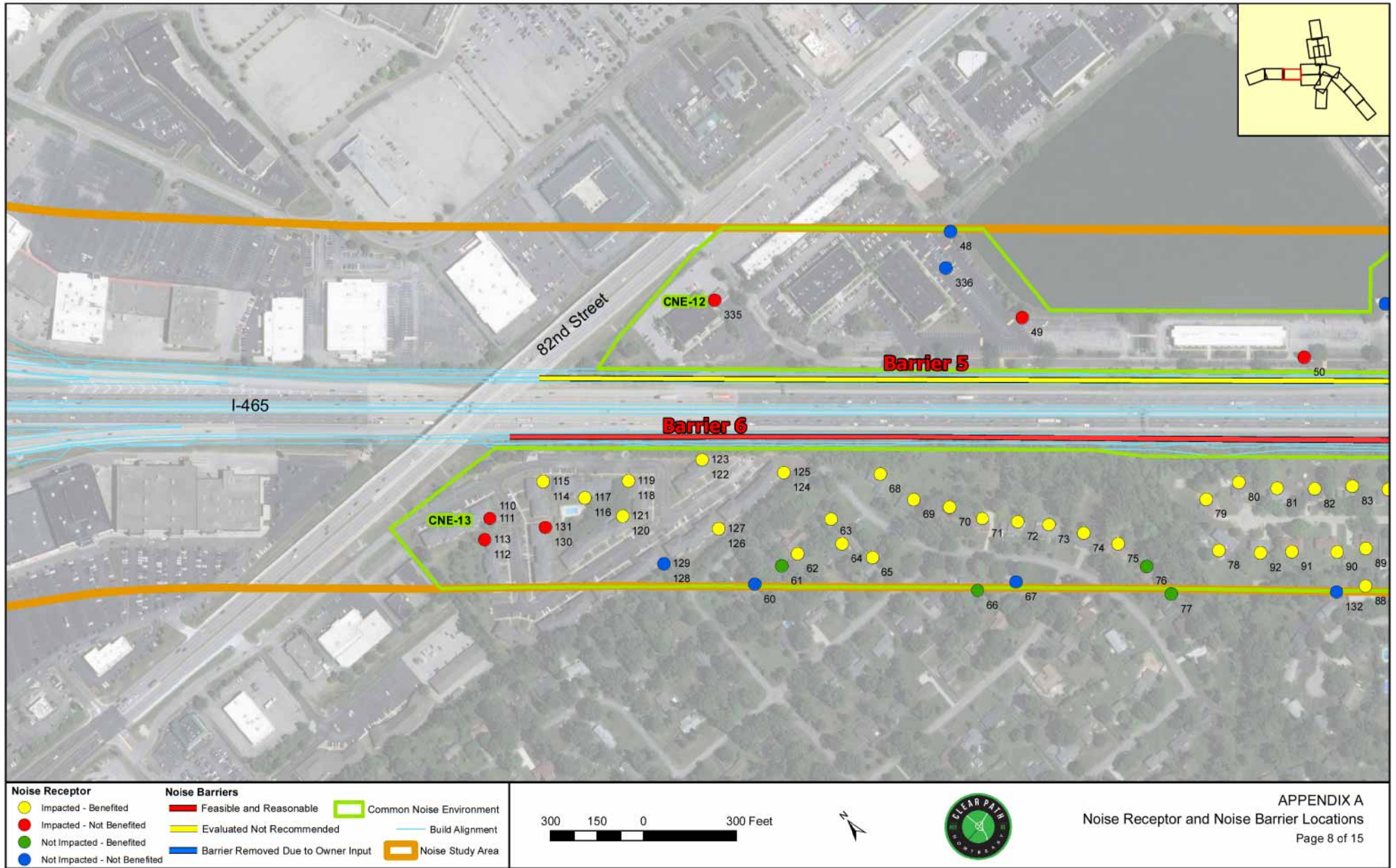


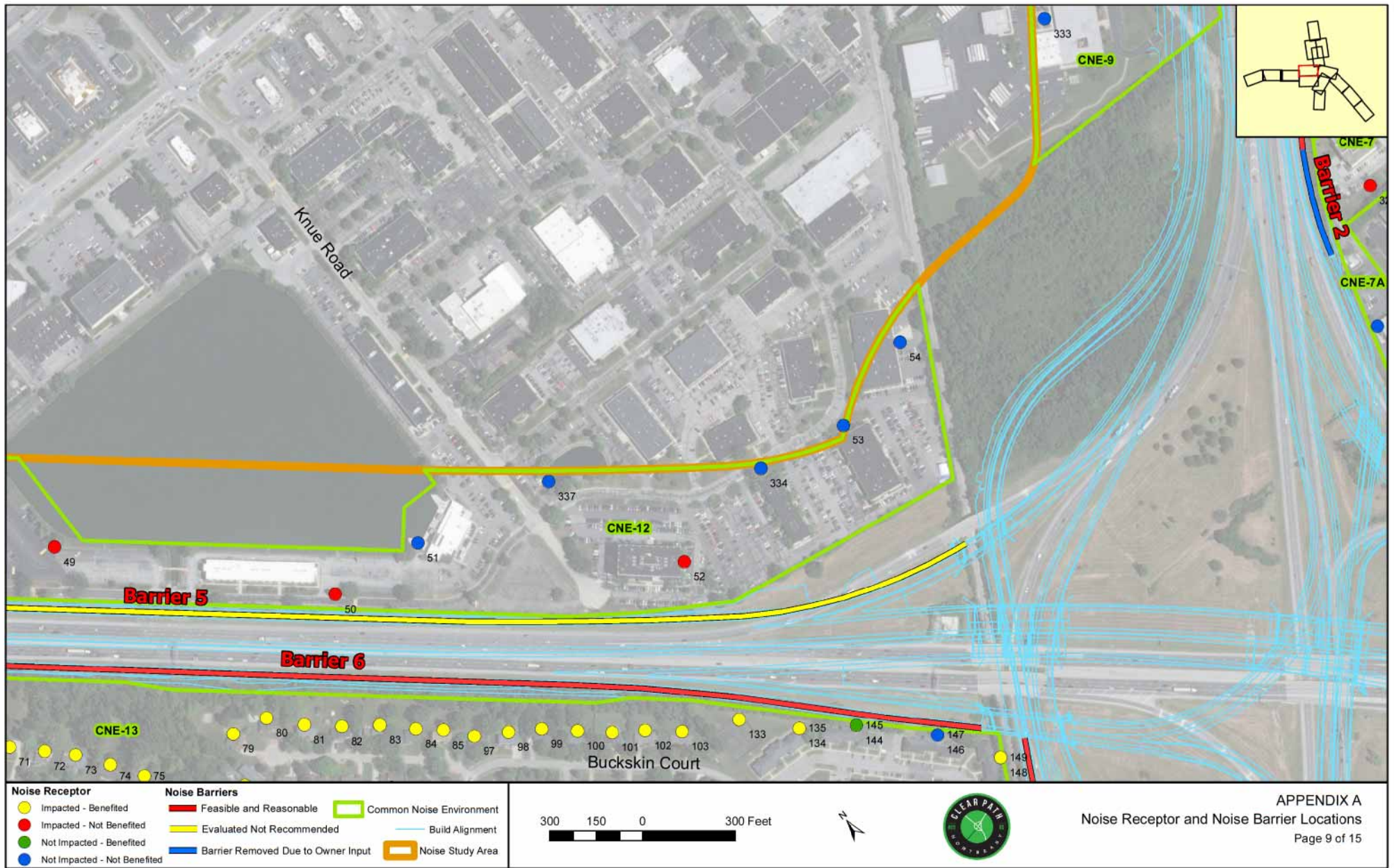


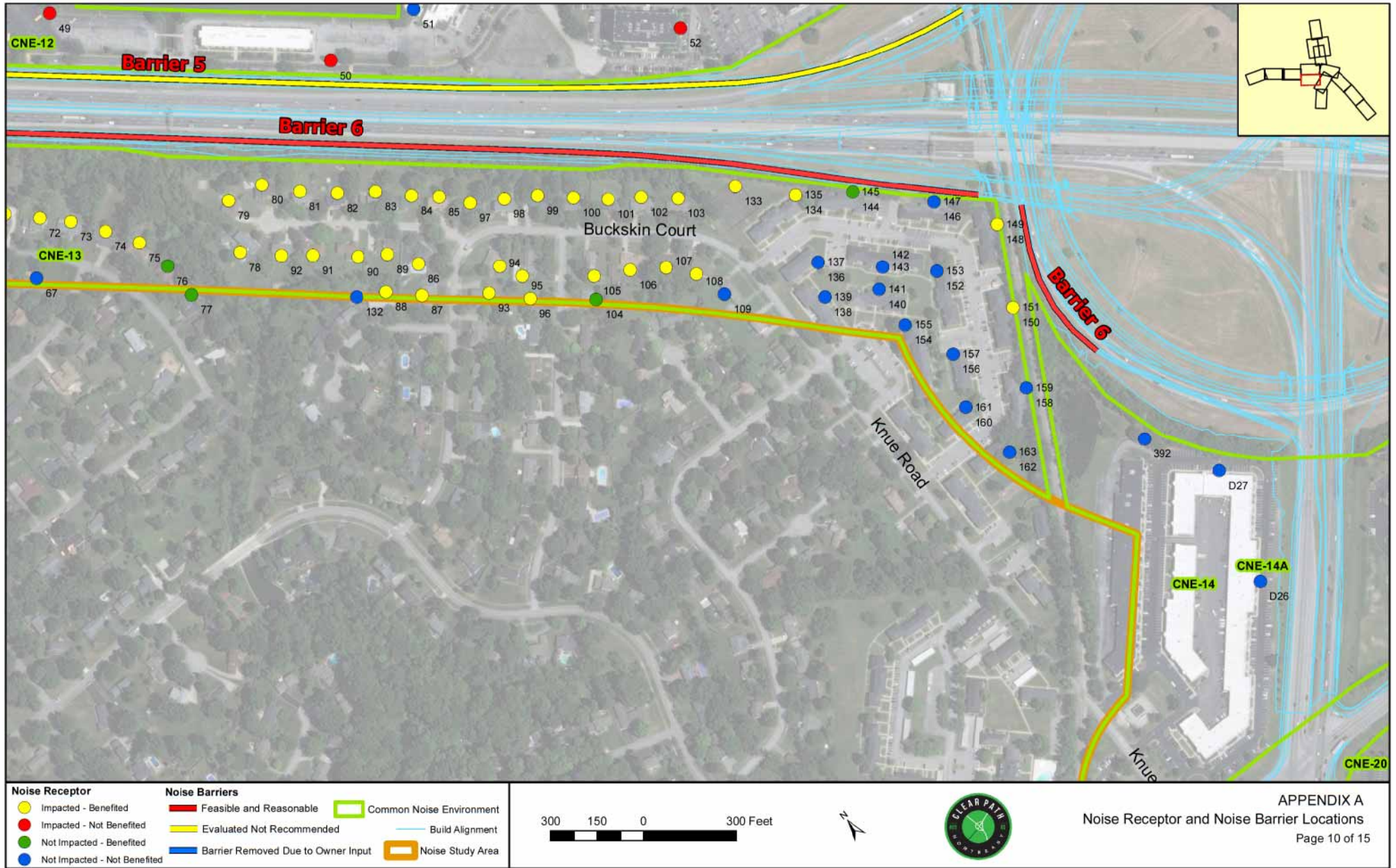
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●	Impacted - Benefited	—	Feasible and Reasonable
●	Impacted - Not Benefited	—	Evaluated Not Recommended
●	Not Impacted - Benefited	—	Barrier Removed Due to Owner Input
●	Not Impacted - Not Benefited		Common Noise Environment
		—	Build Alignment
			Noise Study Area

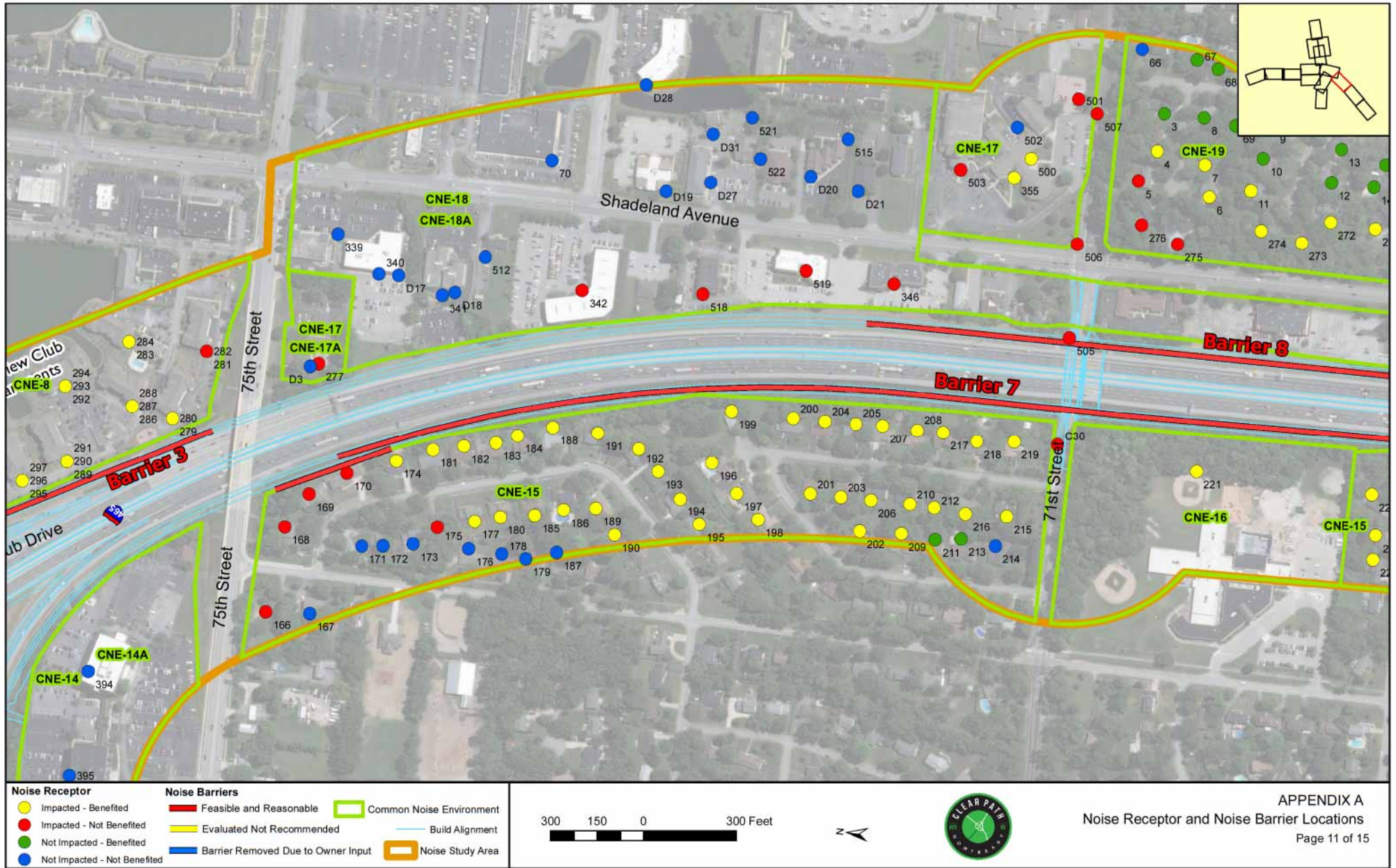


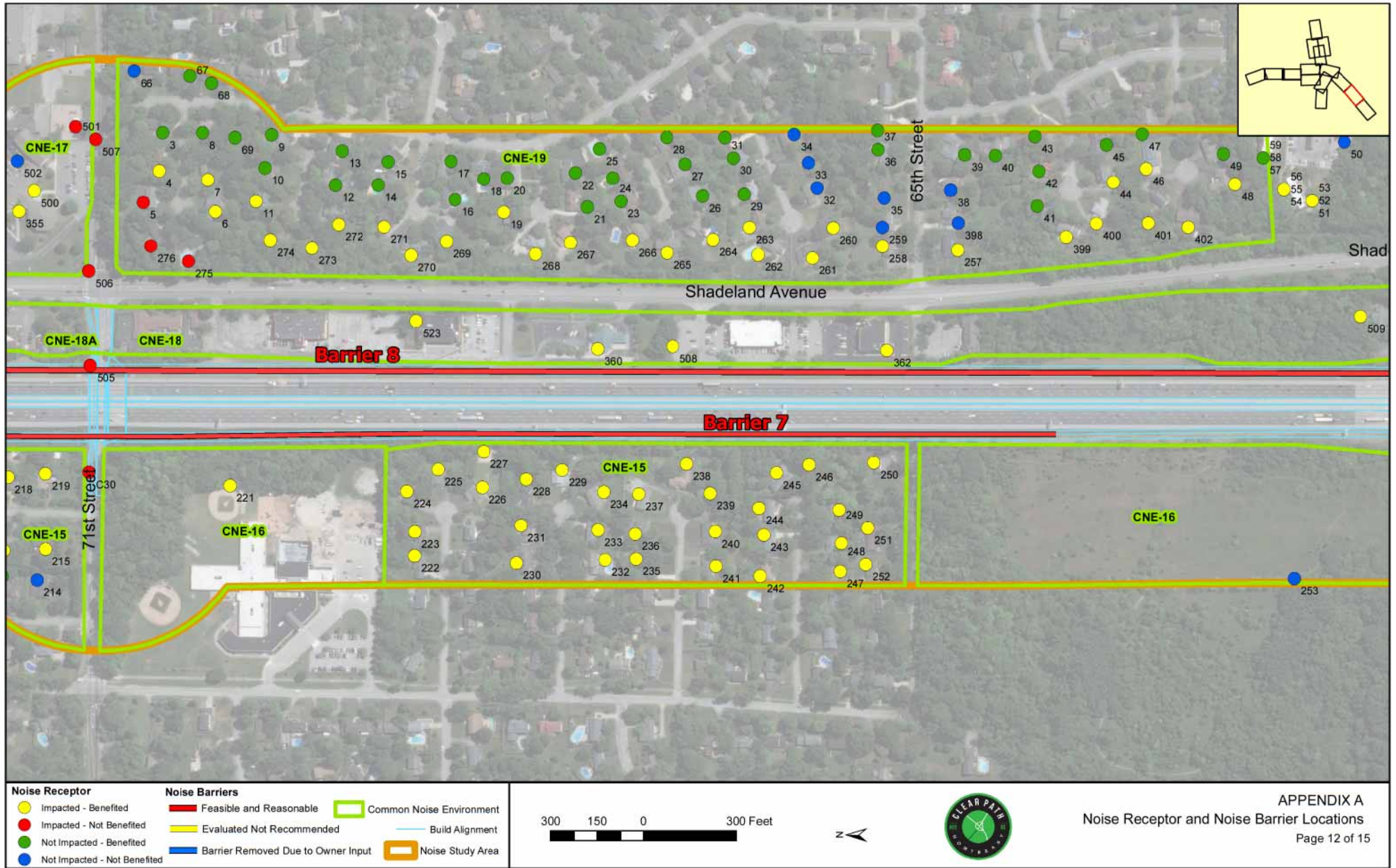
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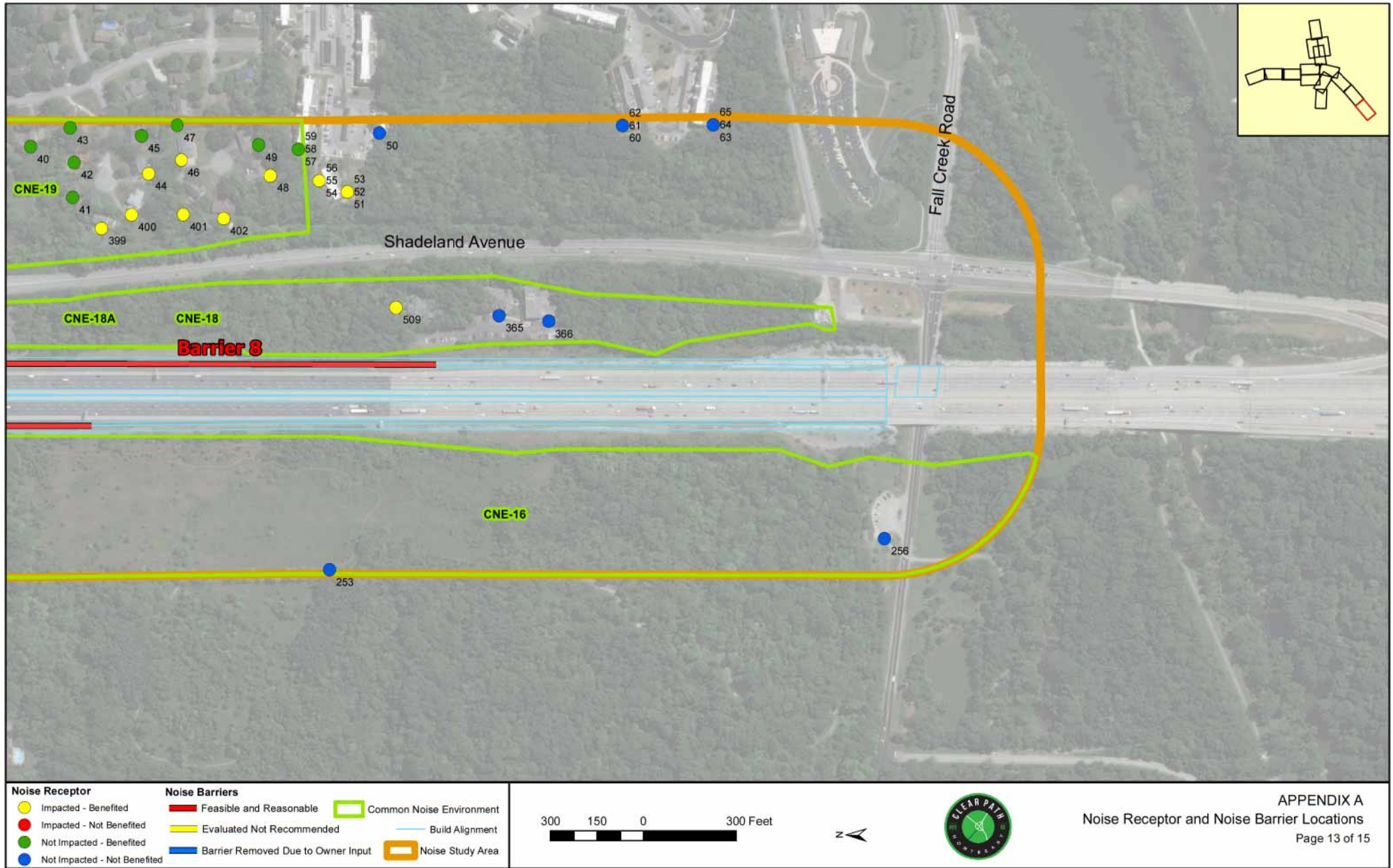


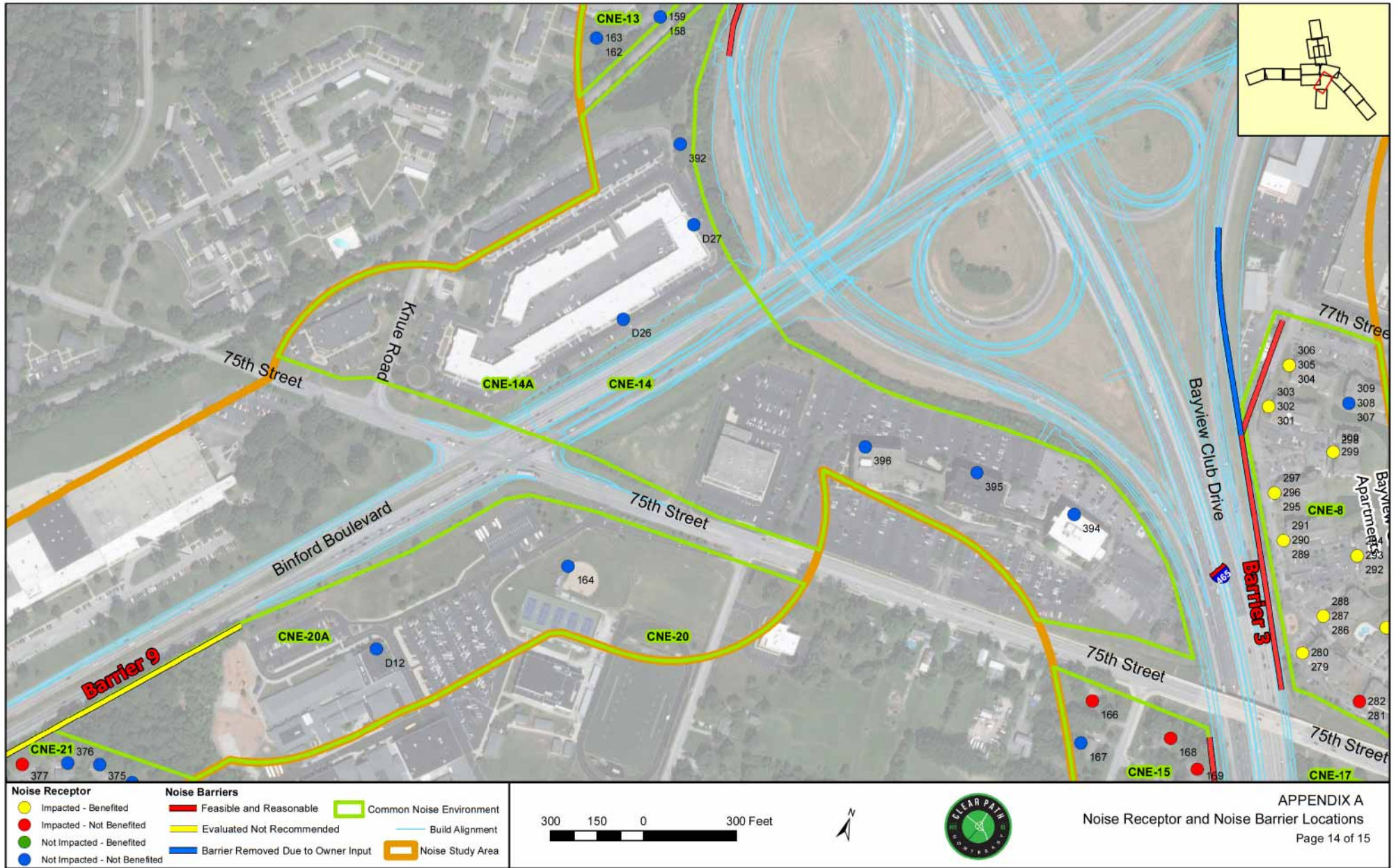


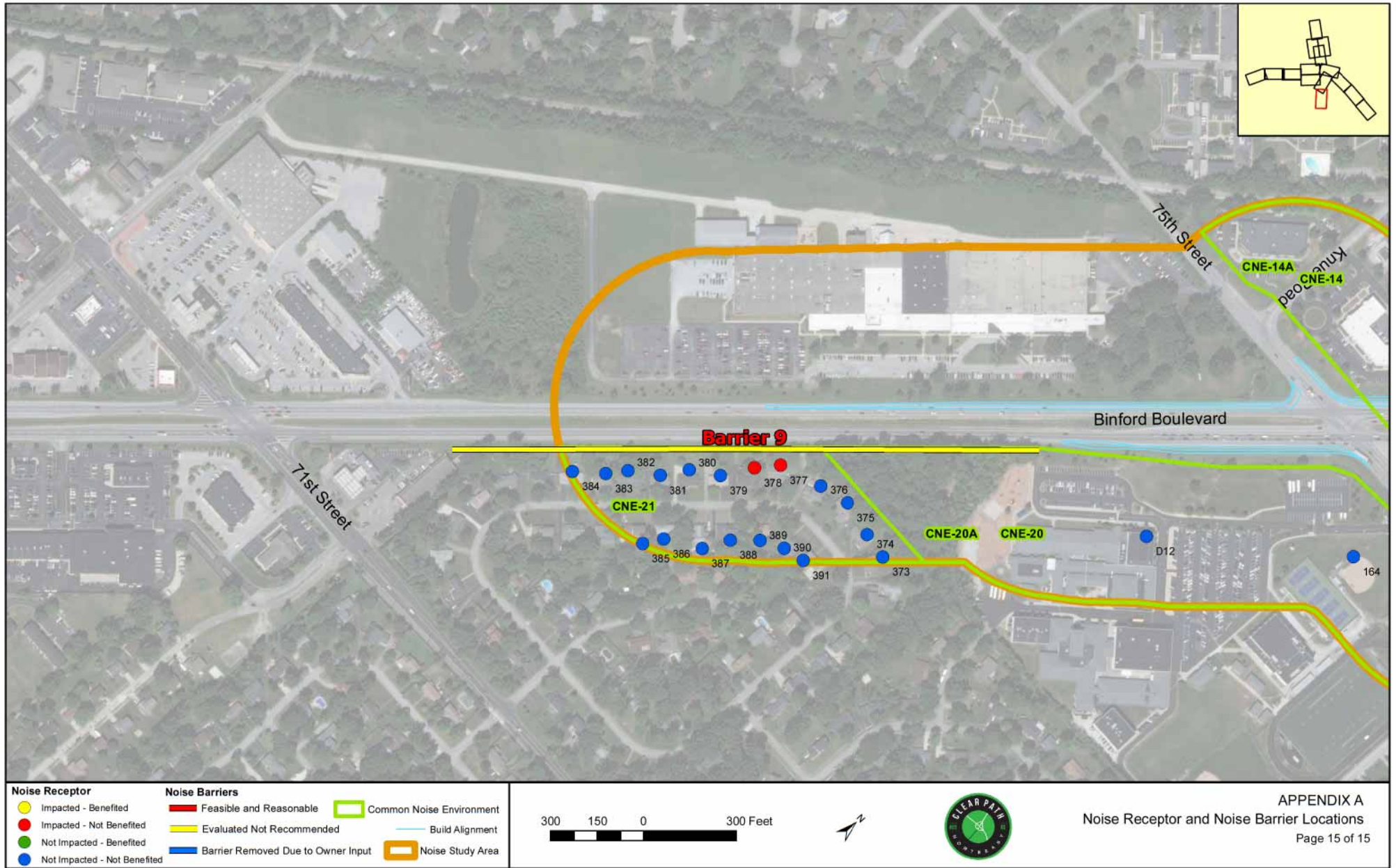




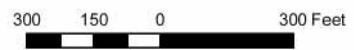








Noise Receptor		Noise Barriers	
●	Impacted - Benefited	—	Feasible and Reasonable
●	Impacted - Not Benefited	—	Evaluated Not Recommended
●	Not Impacted - Benefited	—	Barrier Removed Due to Owner Input
●	Not Impacted - Not Benefited		Common Noise Environment
		—	Build Alignment
			Noise Study Area



APPENDIX A
Noise Receptor and Noise Barrier Locations
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Appendix H – Public Involvement



December 2018 Survey

December 5, 2018

Dear Resident/Property Owner:

On behalf of the Indiana Department of Transportation (INDOT), Parsons is soliciting input from residents/property owners that have been determined to benefit from the construction of noise barriers for the Clear Path 465 Project on the northeast side of Indianapolis, in Marion County. The project includes the modification of the I-465/I-69 interchange to improve capacity and safety and the modification of interchange ramps at I-465/Allisonville Road and I-69/82nd Street to accommodate added travel lanes on I-465 and I-69, which will be added as part of the project. The need for the Clear Path 465 project stems from insufficient capacity that causes backups during the peak hours and safety concerns due to a high volume of crashes within the Project Area. The purpose of the Clear Path 465 Project is to improve overall traffic operation and to improve safety.

Noise barriers are proposed at six locations: 1) east side of I-69, north of 82nd Street; 2) east side of I-69, south of 82nd Street; 3) north of 75th Street, along the I-465 northbound to I-69 northbound ramp; 4) north side of I-465, west of Allisonville Road; 5) south side of I-465, east of Allisonville Road; 6) west side of I-465, south of 75th Street. See enclosed maps for specific project locations.

INDOT evaluates noise abatement measures for feasibility and reasonableness. If proven feasible and reasonable, then any residents and/or property owners that have been determined to benefit from the construction of a noise barrier are given the opportunity to provide their input. INDOT then makes the decision whether to construct the noise barrier based on feasibility, reasonableness, and percentage of supportive responses from the benefited residents and/or property owners. Preliminary findings show that the proposed noise barriers are both feasible and reasonable. At this time, INDOT needs your input on whether you want the proposed noise barrier constructed in your area.

At a meeting to discuss potential noise barriers, the project team will present INDOT's noise mitigation process and proposed noise barrier locations. Project staff will be available to answer questions and solicit input from the public. Your attendance and participation are encouraged.

The meeting will be held: **Monday, December 17, 2018 at 6:00 pm**
Heritage Christian School
6401 East 75th Street, Indianapolis, IN 46250

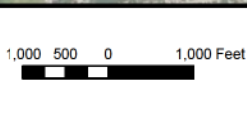
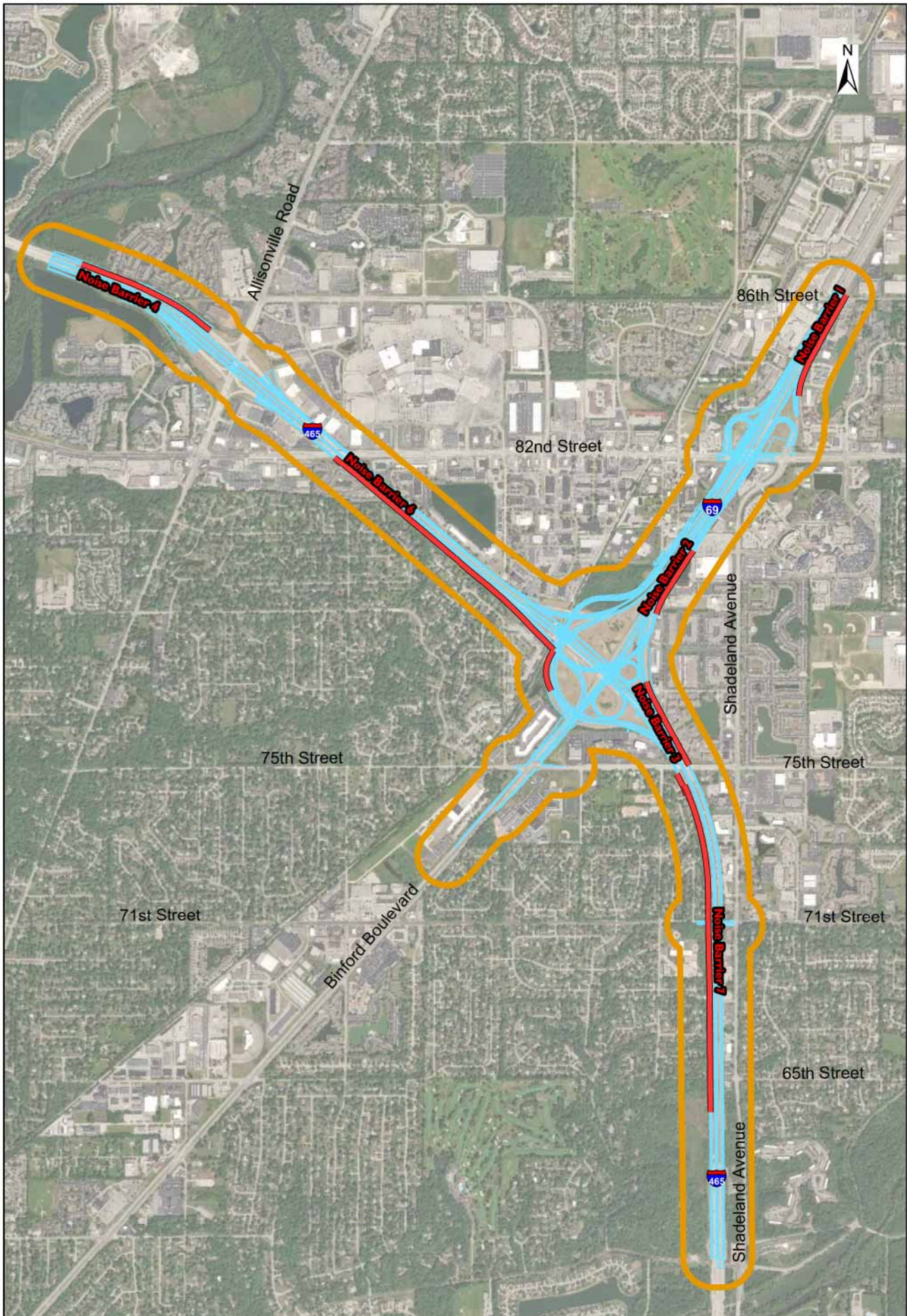
Enclosed are maps showing the locations of proposed barriers and a survey postcard. We request that you either bring the postcard to the meeting or mail the completed postcard to the address on the postcard by January 17, 2019. Without input from the majority of nearby property owners, the noise barriers may not be warranted per INDOT noise policy. Therefore, it is very important that you submit the survey postcard.

We look forward to meeting with you on **Monday, December 17 at 6:00 pm**. Should you have additional questions regarding this meeting, please contact Dan Miller, Environmental Service Manager with Parsons at (317) 616-4663 or via e-mail at Daniel.J.Miller@parsons.com.

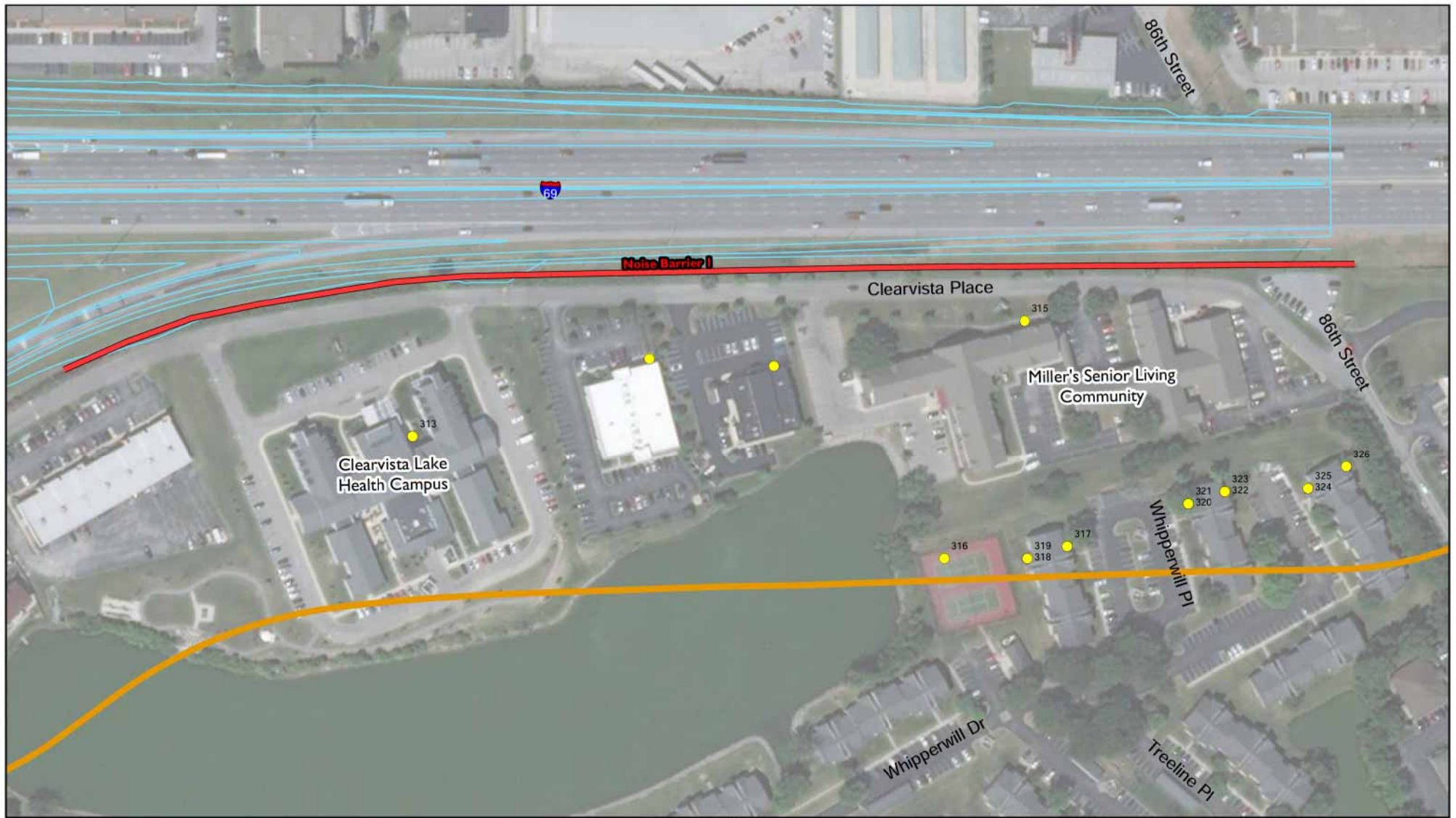
Sincerely,



Daniel J. Miller
Environmental Service Manager
Parsons



Noise Barriers - Overview

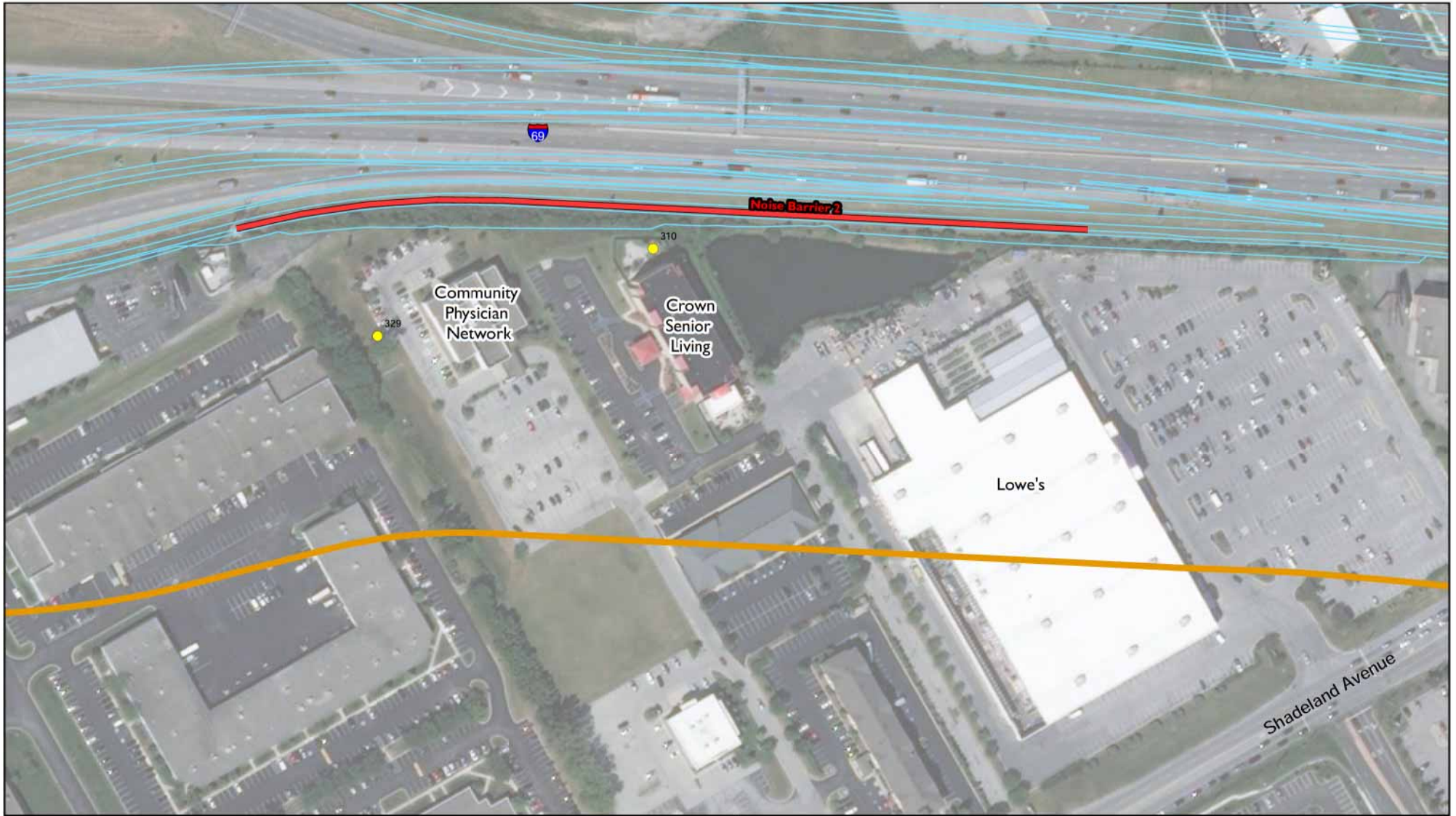


Legend

- Noise Receptor
- Preliminary Reasonable and Feasible Noise Barriers
- Noise Study Area - 500 feet
- Build Alignment

160 80 0 160 Feet

Noise Barrier 1

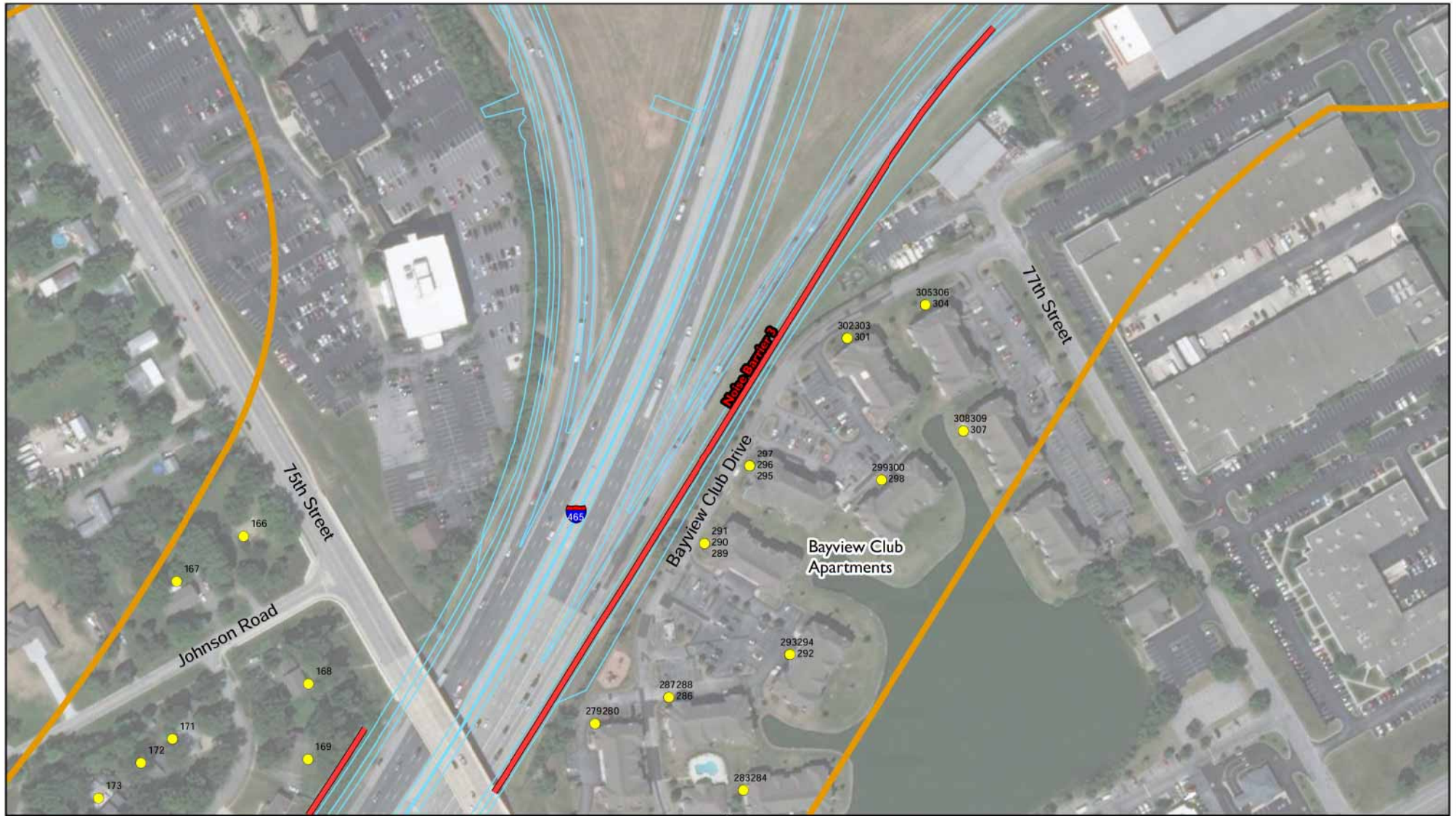


Legend

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- Noise Study Area - 500 feet
- Build Alignment

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Noise Barrier 2

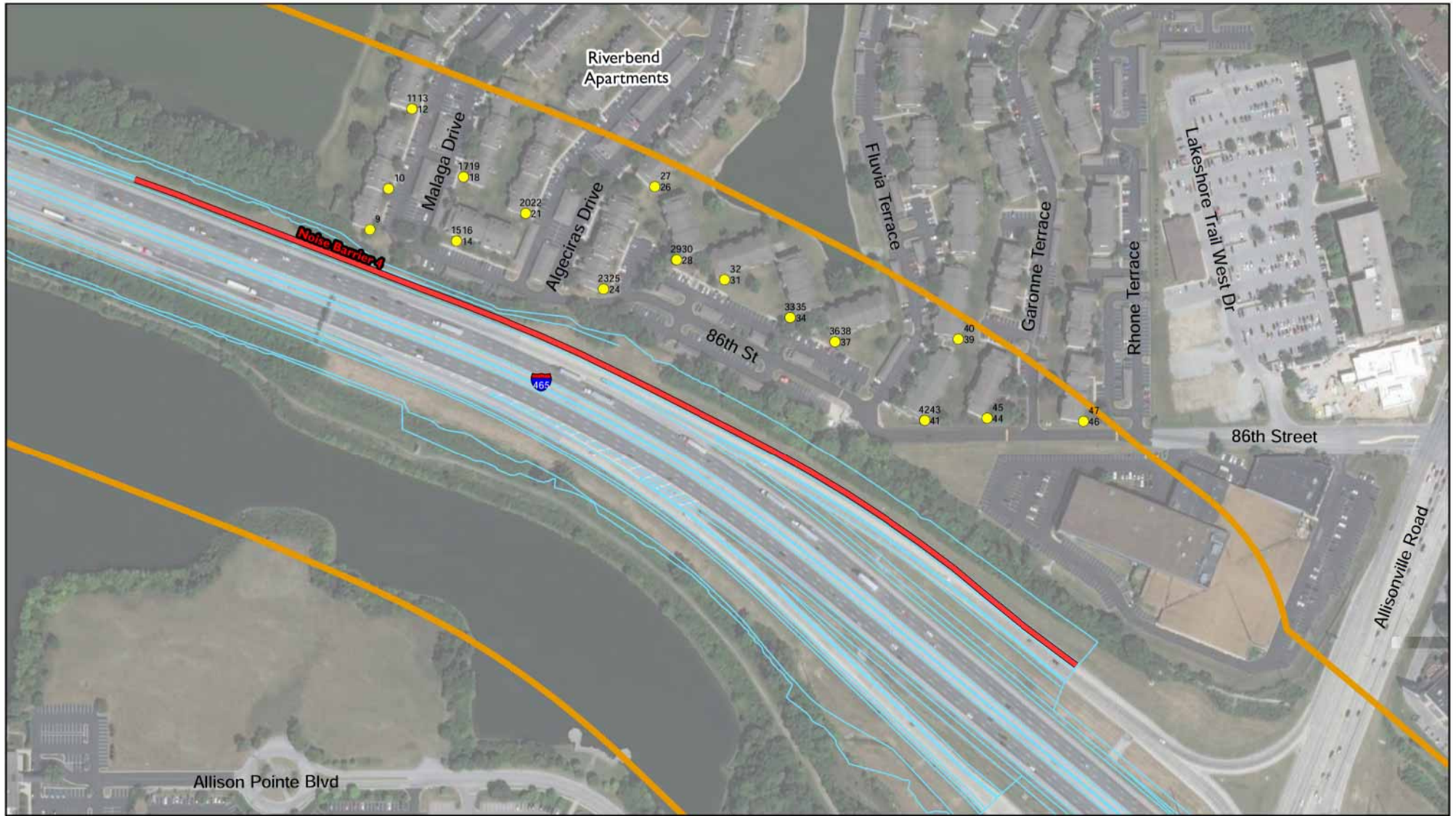






Legend

- Noise Receptor
- Preliminary Reasonable and Feasible Noise Barriers
- Noise Study Area - 500 feet
- Build Alignment



Noise Barrier 3



Legend			
	Noise Receptor		Preliminary Reasonable and Feasible Noise Barriers
	Build Alignment		Noise Study Area - 500 feet



260 130 0 260 Feet

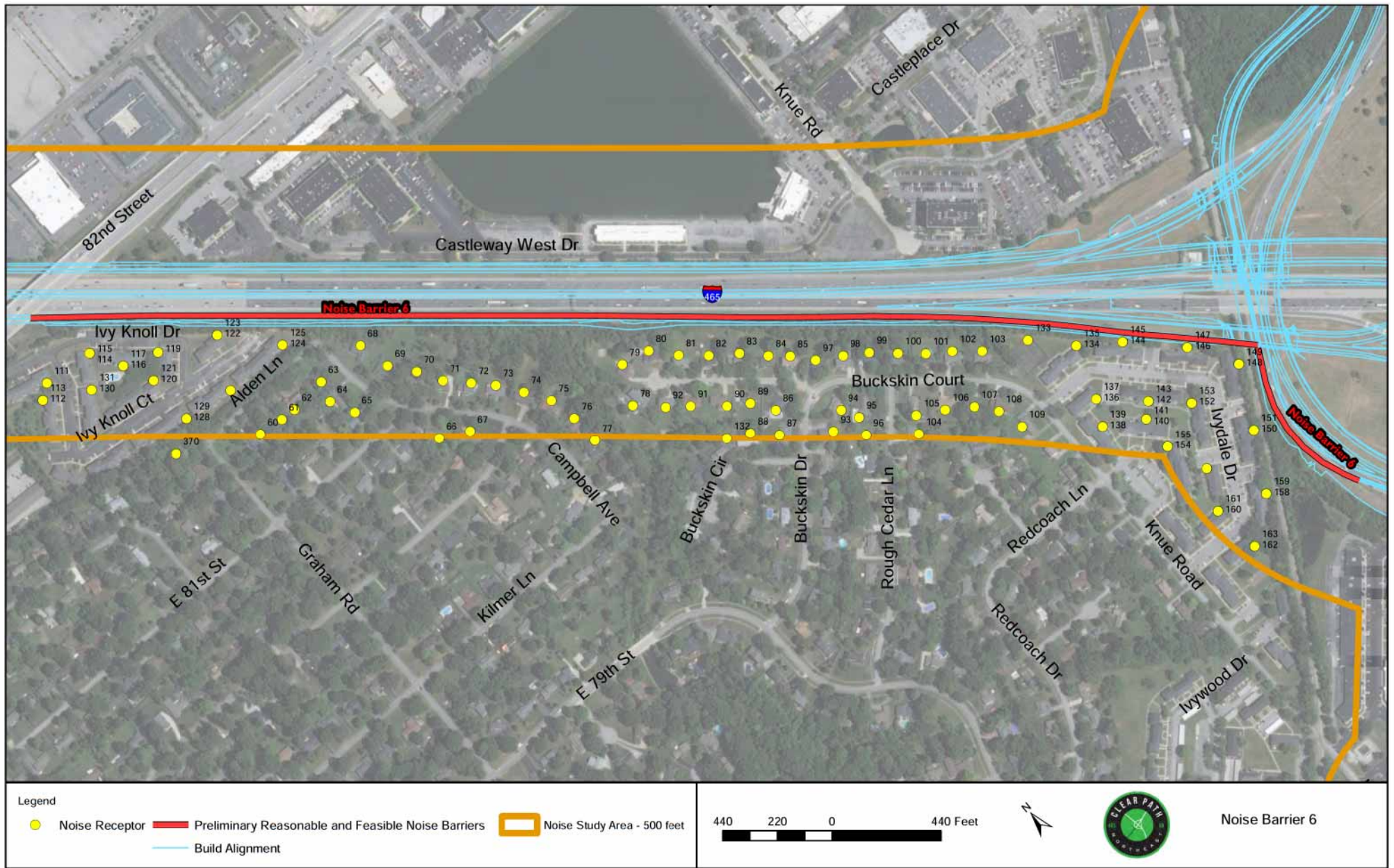


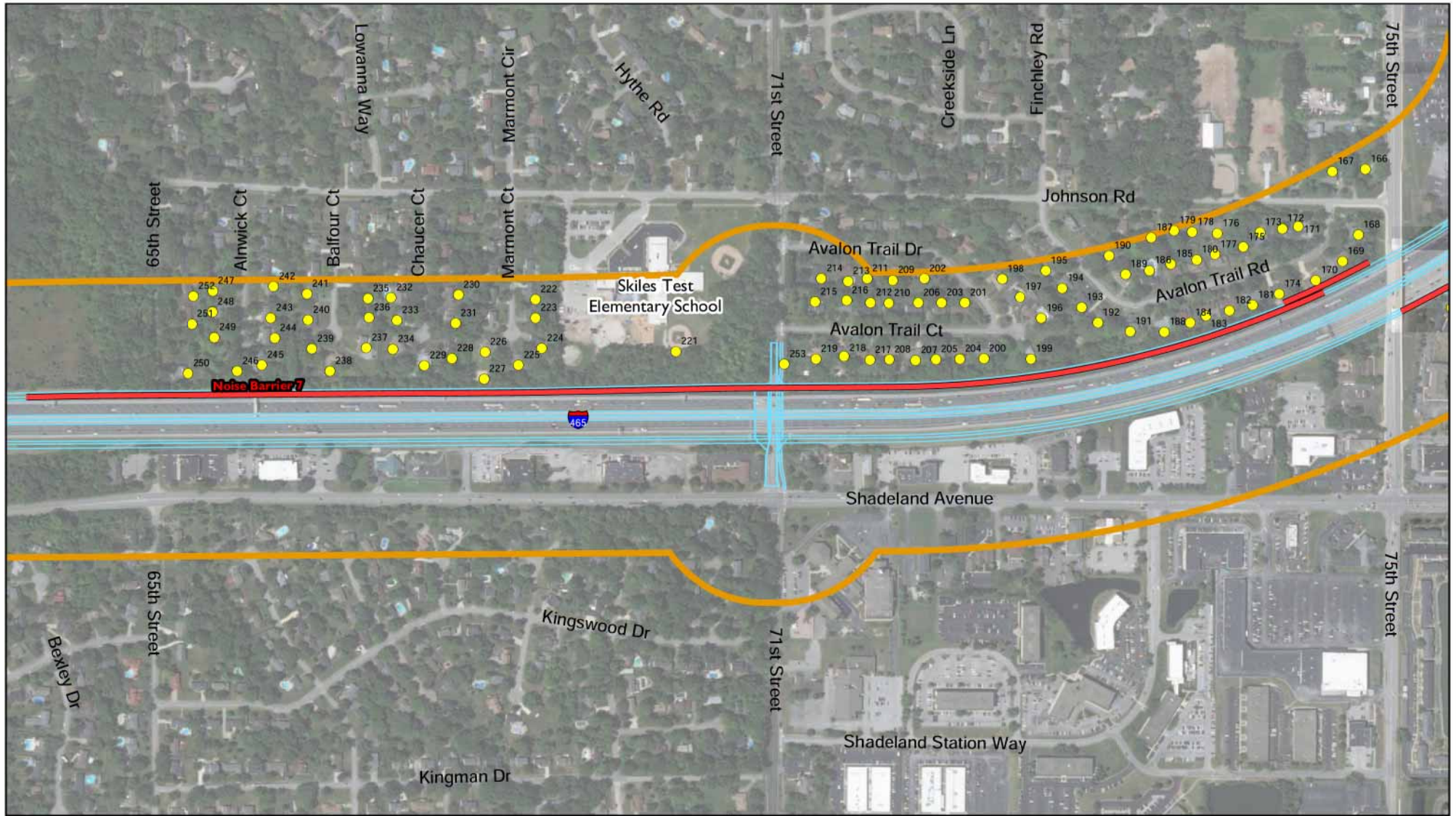
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CLEAR PATH

Noise Barrier 4





Legend

- Noise Receptor
- Preliminary Reasonable and Feasible Noise Barriers
- Noise Study Area - 500 feet
- Build Alignment

490 245 0 490 Feet

Noise Barrier 7

Parsons
Clear Path 465 Project
Attn: Daniel J. Miller
101 West Ohio Street, Suite 2121
Indianapolis, Indiana 46204

Noise Barrier Survey Card

Thank you for completing this survey card. Please only fill out one card per household.

Name (please print): _____

Mailing Address: _____

Property Address:
(if different than above) _____

Are you the property owner? _____

Yes, I want the noise barrier to be constructed.

No, I do not want the noise barrier to be constructed.

Comments:

CLEAR PATH 465 - DECEMBER 2018 NOISE BARRIER SURVEY

NOISE BARRIER	PROPERTY OWNERS RECEIVING LETTER			TOTAL SURVEY RESPONSES RECEIVED	SUPPORT CONSTRUCTION OF NOISE BARRIER?		SUPPORT CONSTRUCTION OF NOISE BARRIER?		TOTAL RESPONSES SUPPORTING CONSTRUCTION OF NOISE BARRIER
	BUSINESS	RESIDENTIAL	TOTAL		BUSINESS YES	BUSINESS NO	RESIDENTIAL YES	RESIDENTIAL NO	
1	6	0	6	2	1	1	0	0	1
2	5	0	5	2	1	1	0	0	1
3	3	186	189	6	0	2	4	0	4
4	2	325	327	4	0	1	1	2	1
6	2	248	250	45	0	0	44	1	44
7	2	80	82	31	0	0	30	1	30
TOTALS	20	839	859	90	2	5	79	4	81



February 2019 Survey

February 25, 2019

Dear Resident/Property Owner:

On behalf of the Indiana Department of Transportation (INDOT), Parsons is soliciting input from residents/property owners that have been determined to benefit from the construction of noise barriers for the Clear Path 465 Project on the northeast side of Indianapolis, in Marion County. The project includes the modification of the I-465/I-69 interchange to improve capacity and safety and the modification of interchange ramps at I-465/Allisonville Road and I-69/82nd Street to accommodate added travel lanes on I-465 and I-69, which will be added as part of the project. The need for the Clear Path 465 project stems from insufficient capacity that causes backups during the peak hours and safety concerns due to a high volume of crashes within the Project Area. The purpose of the Clear Path 465 Project is to improve overall traffic operation and to improve safety.

Noise barriers are proposed at six locations: 1) east side of I-69, north of 82nd Street; 2) east side of I-69, south of 82nd Street; 3) north of 75th Street, along the I-465 northbound to I-69 northbound ramp; 4) north side of I-465, west of Allisonville Road; 5) south side of I-465, east of Allisonville Road; and 6) west side of I-465, south of 75th Street. See enclosed maps for specific project locations.

INDOT evaluates noise abatement measures for feasibility and reasonableness. If proven feasible and reasonable, then any residents and/or property owners that have been determined to benefit from the construction of a noise barrier are given the opportunity to provide their input. INDOT then makes the decision whether to construct the noise barrier based on feasibility, reasonableness, and percentage of supportive responses from the benefited residents and/or property owners. Preliminary findings show that the proposed noise barriers are both feasible and reasonable. At this time, INDOT needs your input on whether you want the proposed noise barrier constructed in your area.

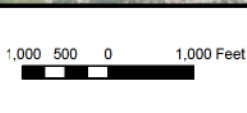
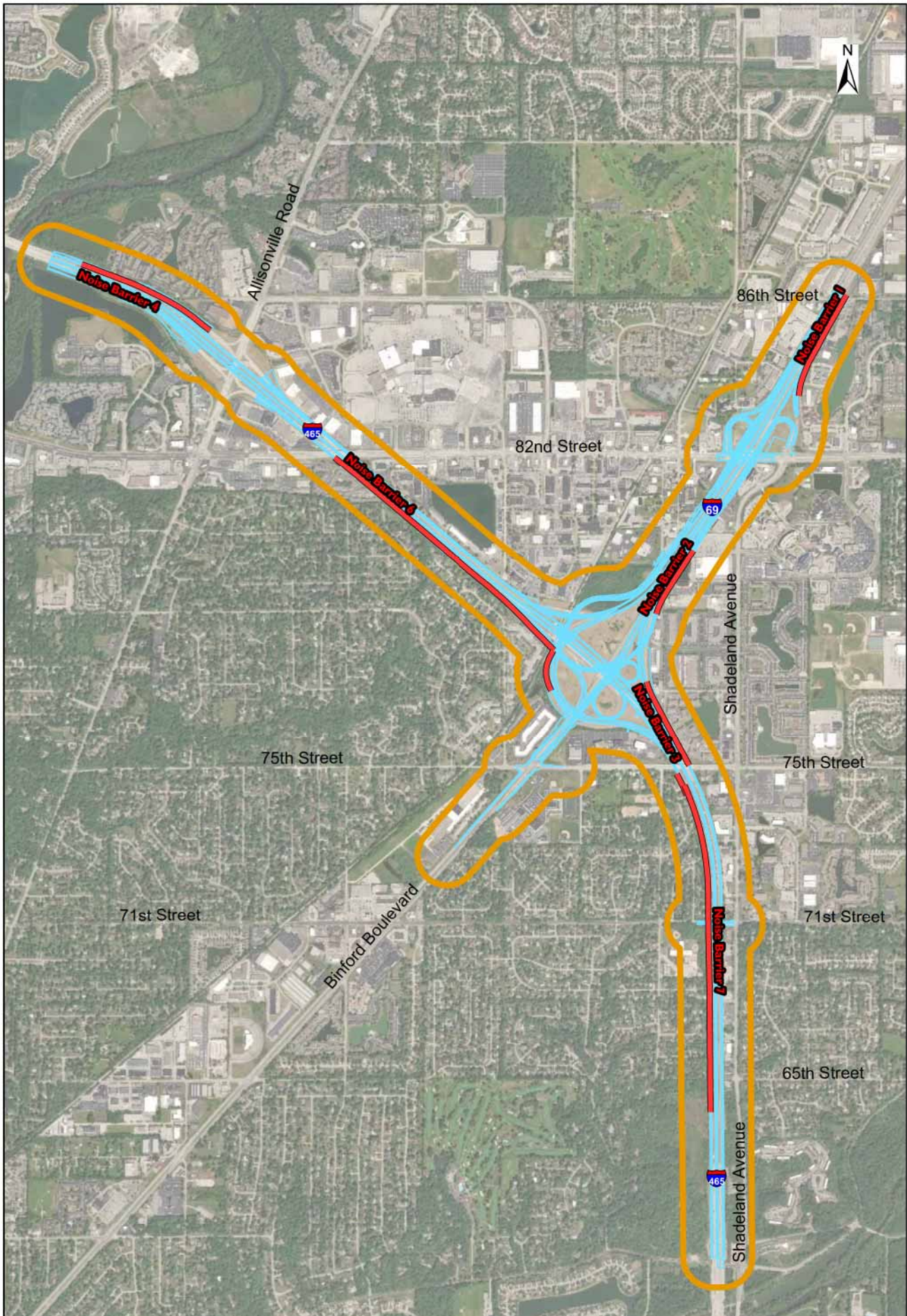
In early December, we sent you a letter requesting your input on whether you want the proposed noise barrier constructed in your area. In that letter we also provided notification for a public meeting regarding the noise barriers for Monday, December 17, 2018. However, we did not receive a survey postcard response from you, with your vote on whether or not you would like the barrier built. Per the INDOT Noise Policy, if after the second attempt to collect votes, a majority of property owners (50% +1) do not respond, a noise barrier may not be warranted for construction. Therefore, as this is the second attempt to collect a vote, it is very important that you submit the survey postcard no later than March 29, 2019.

Enclosed are maps showing the locations of proposed barriers and a stamped survey postcard addressed to Parsons. We look forward to hearing from you. Should you have additional questions regarding this meeting, please contact Dan Miller, Environmental Service Manager with Parsons at (317) 616-4663 or via e-mail at Daniel.J.Miller@parsons.com.

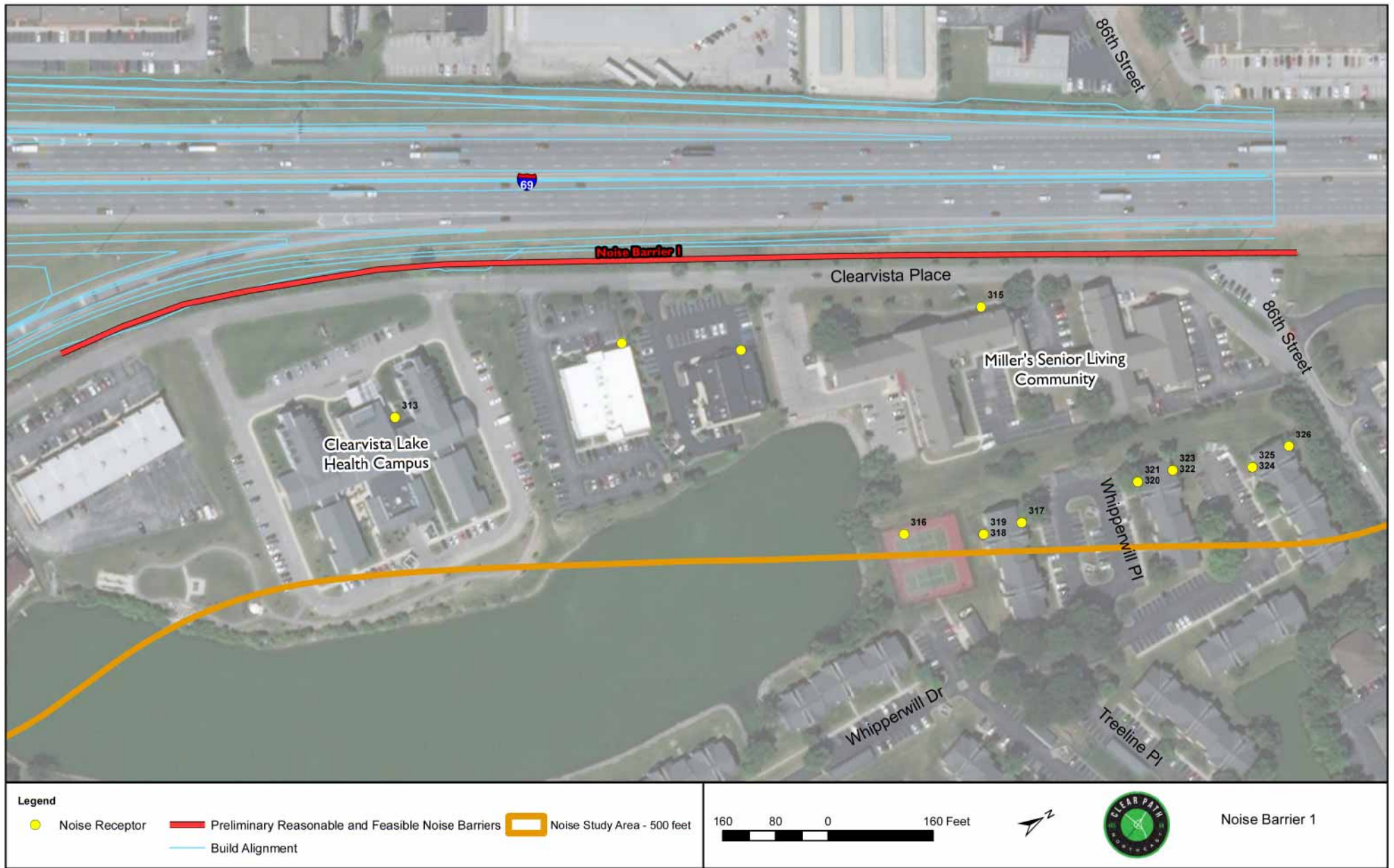
Sincerely,

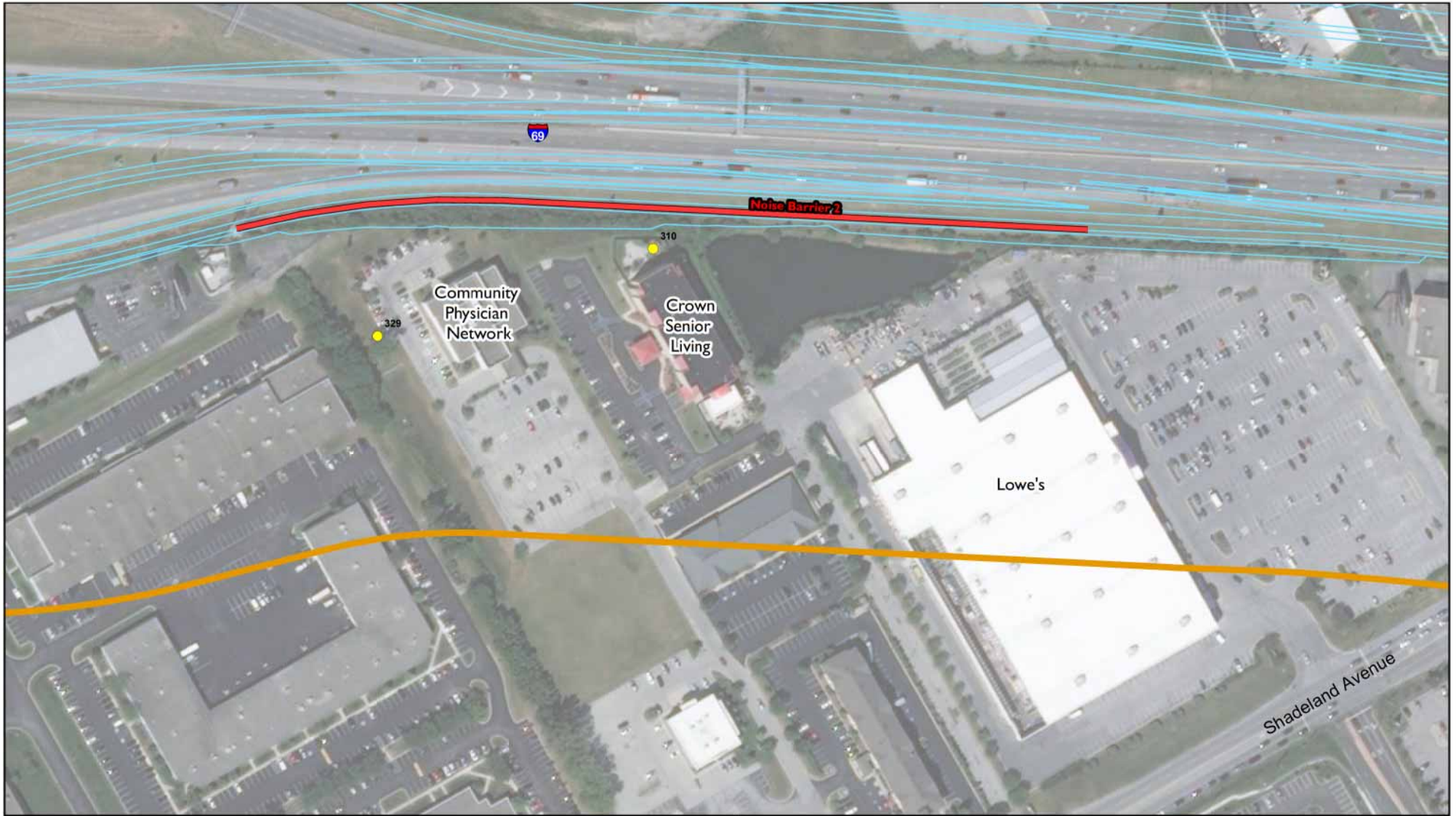


Daniel J. Miller
Environmental Service Manager
Parsons



Noise Barriers - Overview



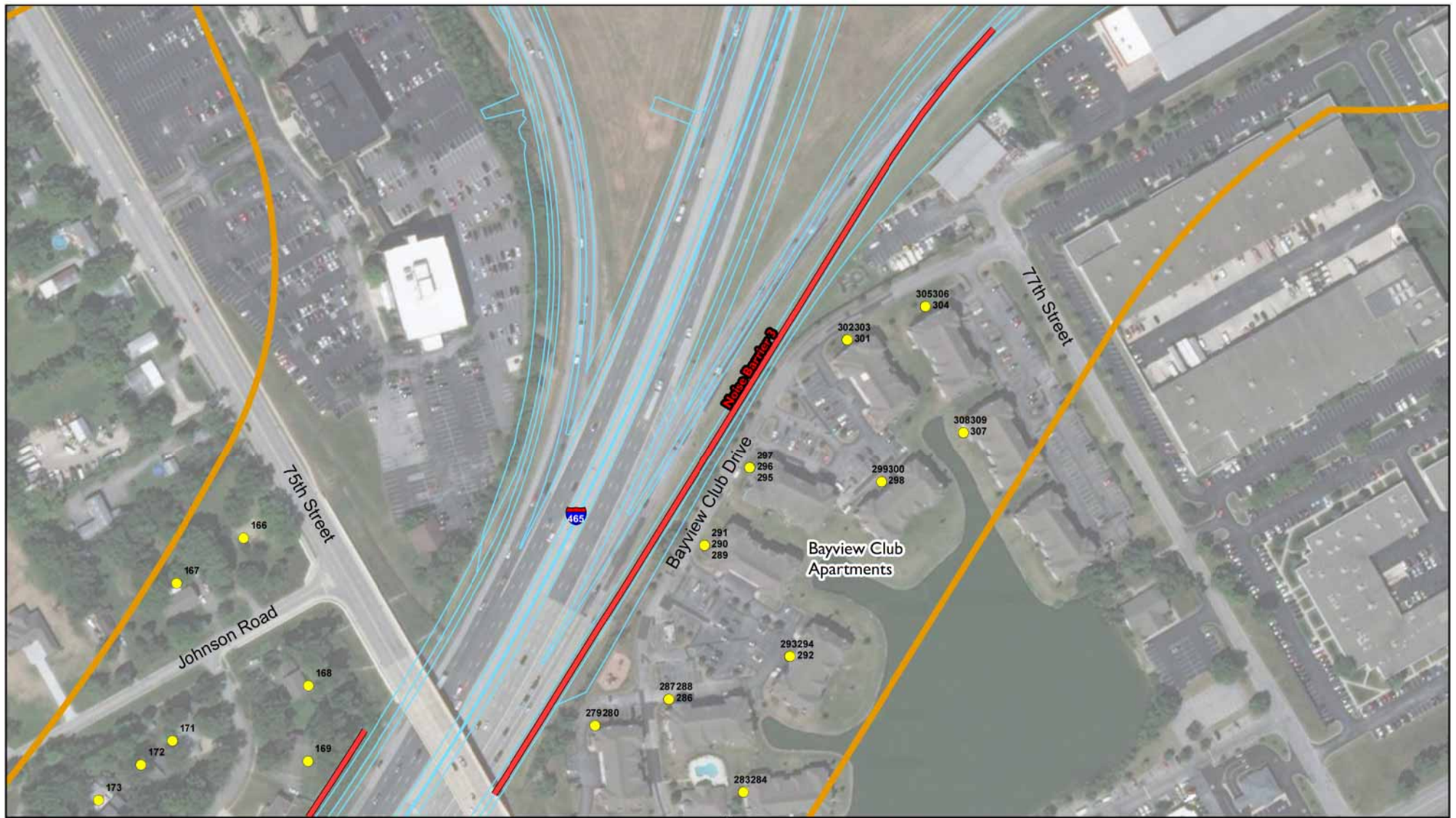


Legend

- Noise Receptor
- Preliminary Reasonable and Feasible Noise Barriers
- Noise Study Area - 500 feet
- Build Alignment

160 80 0 160 Feet

Noise Barrier 2

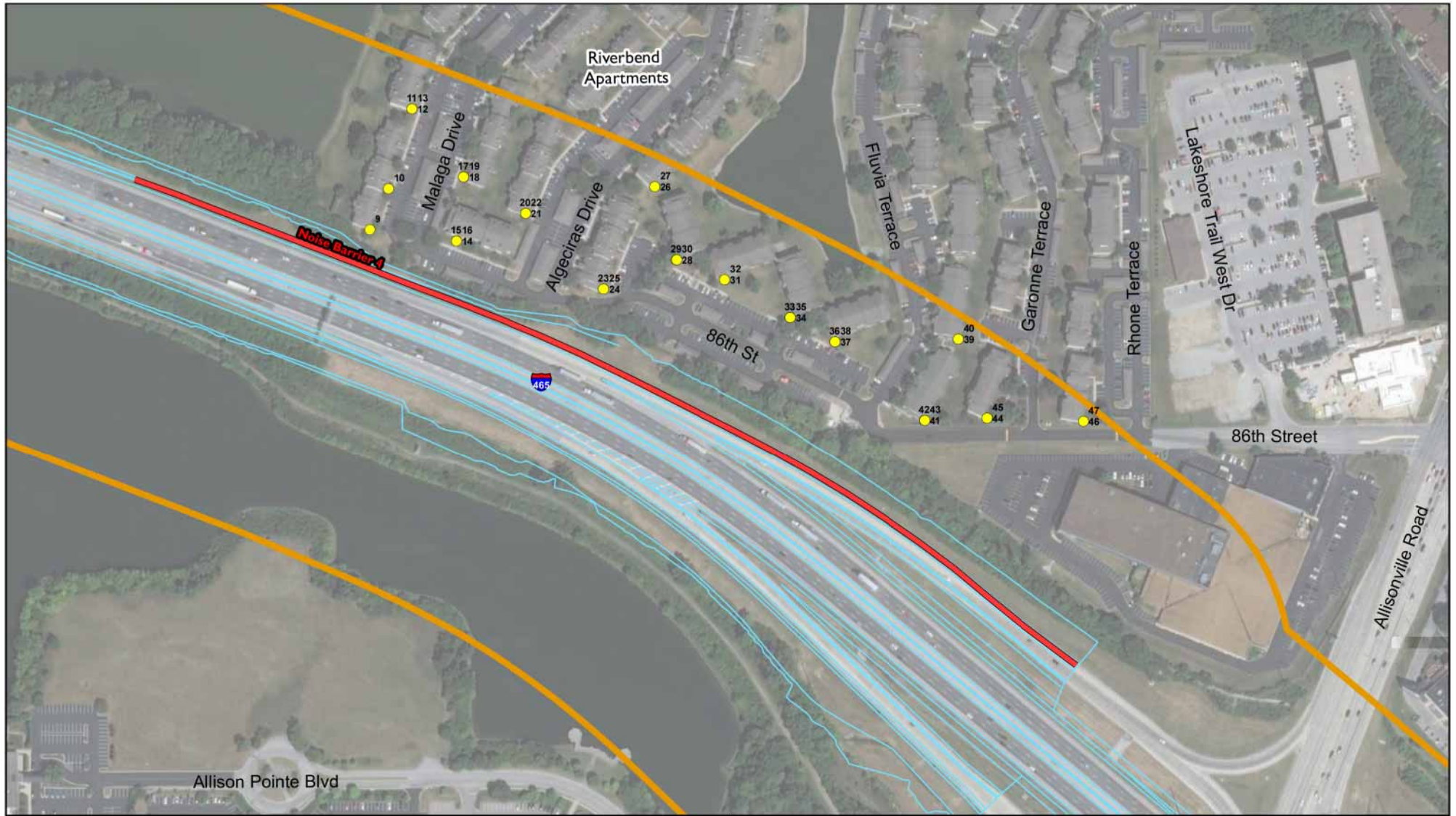


Legend

- Noise Receptor
- Preliminary Reasonable and Feasible Noise Barriers
- Noise Study Area - 500 feet
- Build Alignment



Noise Barrier 3



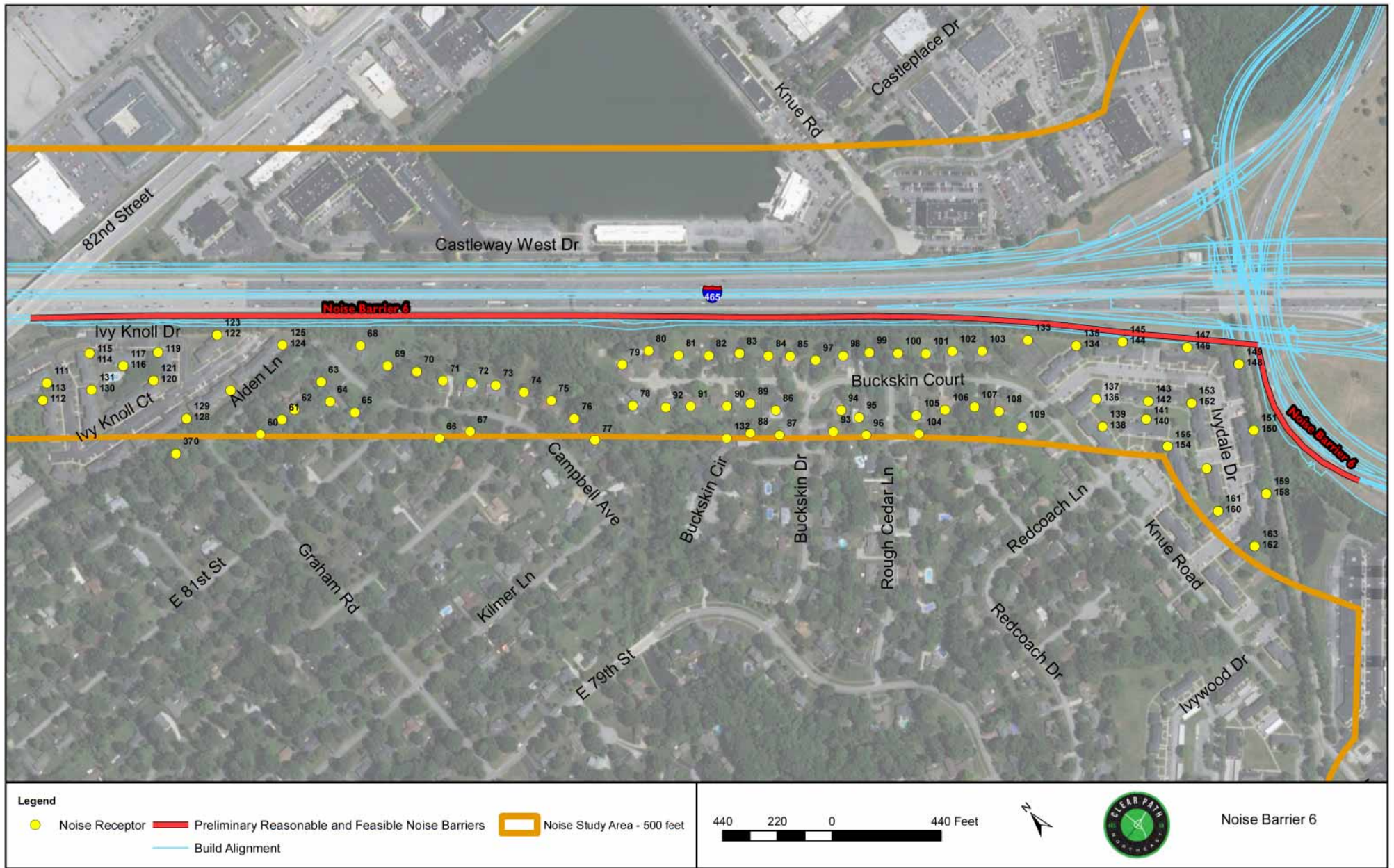
Legend

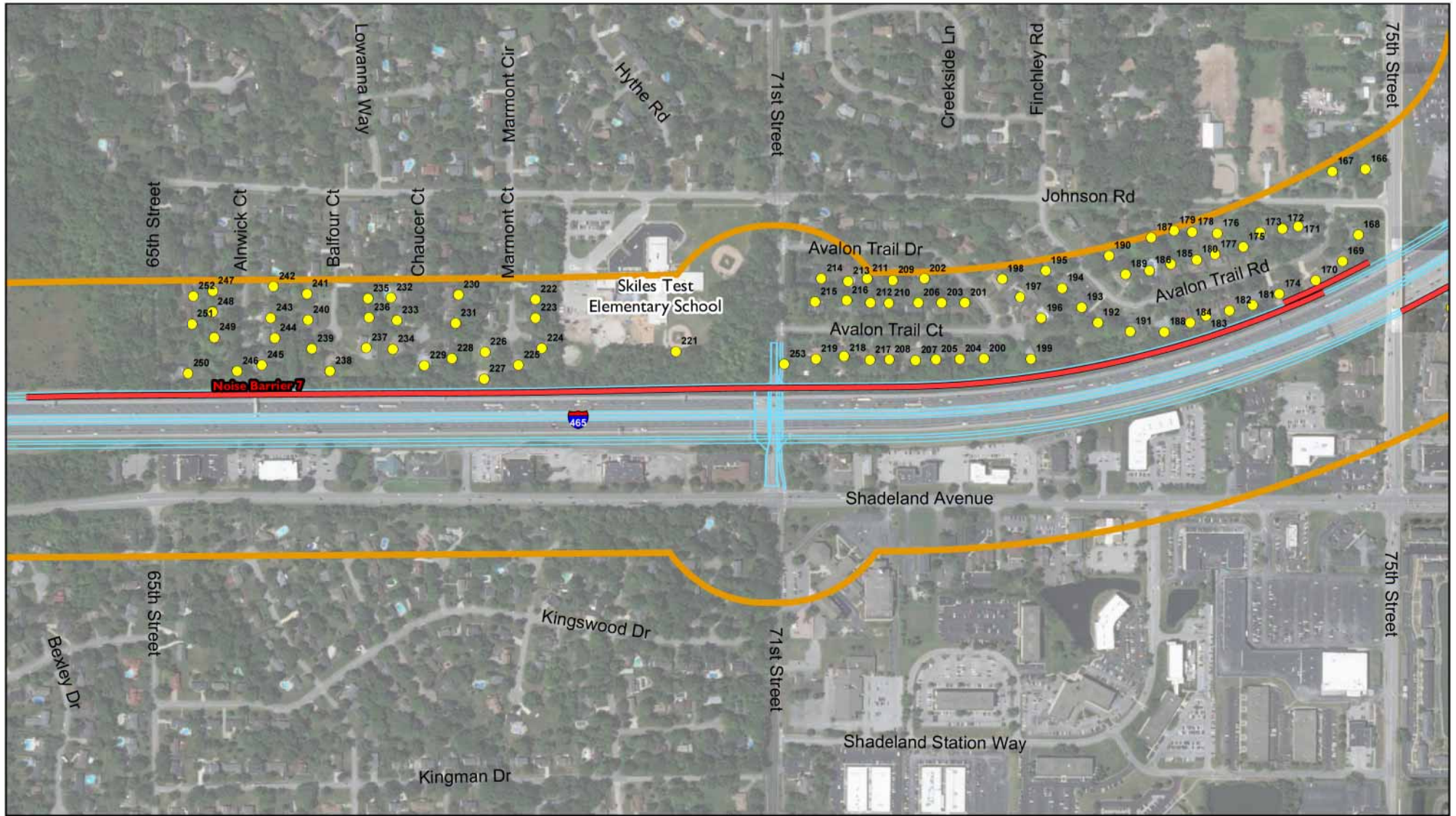
- Noise Receptor
- Preliminary Reasonable and Feasible Noise Barriers
- Noise Study Area - 500 feet
- Build Alignment

260 130 0 260 Feet

N

Noise Barrier 4





Legend

- Noise Receptor
- Preliminary Reasonable and Feasible Noise Barriers
- Noise Study Area - 500 feet
- Build Alignment

490 245 0 490 Feet

Noise Barrier 7

Parsons
Clear Path 465 Project
Attn: Daniel J. Miller
101 West Ohio Street, Suite 2121
Indianapolis, Indiana 46204

Noise Barrier Survey Card

Thank you for completing this survey card. Please only fill out one card per household.

Name (please print): _____

Mailing Address: _____

Property Address:
(if different than above) _____

Are you the property owner? _____

Yes, I want the noise barrier to be constructed.

No, I do not want the noise barrier to be constructed.

Comments:

CLEAR PATH 465 - FEBRUARY 2019 NOISE BARRIER SURVEY

NOISE BARRIER	PROPERTY OWNERS RECEIVING LETTER			TOTAL SURVEY RESPONSES RECEIVED	SUPPORT CONSTRUCTION OF NOISE BARRIER?		SUPPORT CONSTRUCTION OF NOISE BARRIER?		TOTAL RESPONSES SUPPORTING CONSTRUCTION OF NOISE BARRIER
	BUSINESS	RESIDENTIAL	TOTAL		BUSINESS YES	BUSINESS NO	RESIDENTIAL YES	RESIDENTIAL NO	
1	4	0	4	4	2	2	0	0	2
2	3	0	3	1	0	1	0	0	0
3	1	183	184	8	1	0	7	0	8
4	1	322	323	8	1	0	5	2	6
6	2	204	206	11	2	0	7	2	9
7	2	49	51	21	0	0	20	1	20
TOTALS	13	758	771	53	6	3	39	5	45

CLEAR PATH 465 - DECEMBER 2018 and FEBRUARY 2019 NOISE BARRIER SURVEYS COMBINED OVERALL SUMMARY

NOISE BARRIER	PROPERTY OWNERS RECEIVING LETTER			TOTAL SURVEY RESPONSES RECEIVED	SUPPORT CONSTRUCTION OF NOISE BARRIER?		SUPPORT CONSTRUCTION OF NOISE BARRIER?		TOTAL RESPONSES SUPPORTING CONSTRUCTION OF NOISE BARRIER
	BUSINESS	RESIDENTIAL	TOTAL		BUSINESS YES	BUSINESS NO	RESIDENTIAL YES	RESIDENTIAL NO	
1	6	0	6	6	3	3	0	0	3
2	5	0	5	3	1	2	0	0	1
3	3	186	189	14	1	2	11	0	12
4	2	325	327	12	1	1	6	4	7
6	2	248	250	56	2	0	51	3	53
7	2	80	82	52	0	0	50	2	50
TOTALS	20	839	859	143	8	8	118	9	126



July 2019 Survey

July 18, 2019

Dear Resident/Property Owner:

On behalf of the Indiana Department of Transportation (INDOT), Parsons is soliciting input from residents/property owners that have been determined to benefit from the construction of noise barriers for the Clear Path 465 Project on the northeast side of Indianapolis, in Marion County. The project includes the modification of the I-465/I-69 interchange to improve capacity and safety and the modification of interchange ramps at I-465/Allisonville Road and I-69/82nd Street to accommodate added travel lanes on I-465 and I-69, which will be added as part of the project. The need for the Clear Path 465 project stems from insufficient capacity that causes backups during the peak hours and safety concerns due to a high volume of crashes within the Project Area. The purpose of the Clear Path 465 Project is to improve overall traffic operation and to improve safety.

In December 2018, a meeting was held to discuss potential noise barriers in the Clear Path 465 project area. Since that time, additional noise analysis has been completed, and an additional potentially feasible and reasonable noise barrier has been identified along the east side of I-465 in the vicinity of 71st Street. See enclosed map for the potential noise barrier location.

INDOT evaluates noise abatement measures for feasibility and reasonableness. If proven feasible and reasonable, then any residents and/or property owners that have been determined to benefit from the construction of a noise barrier are given the opportunity to provide their input. INDOT then makes the decision whether to construct the noise barrier based on feasibility, reasonableness, and percentage of supportive responses from the benefited residents and/or property owners. Preliminary findings show that this potential noise barrier is both feasible and reasonable. At this time, INDOT needs your input on whether you want the proposed noise barrier constructed in your area.

At a meeting to discuss potential noise barriers, the project team will present INDOT's noise mitigation process and proposed noise barrier locations. Project staff will be available to answer questions and solicit input from the public. Your attendance and participation are encouraged.

The meeting will be held: **August 7, 2019 from 6:00 – 8:00 pm**
Open House: 6:00 – 7:00 pm; Presentation: 7:00 pm
Heritage Christian School
6401 E. 75th Street, Indianapolis, IN 46250

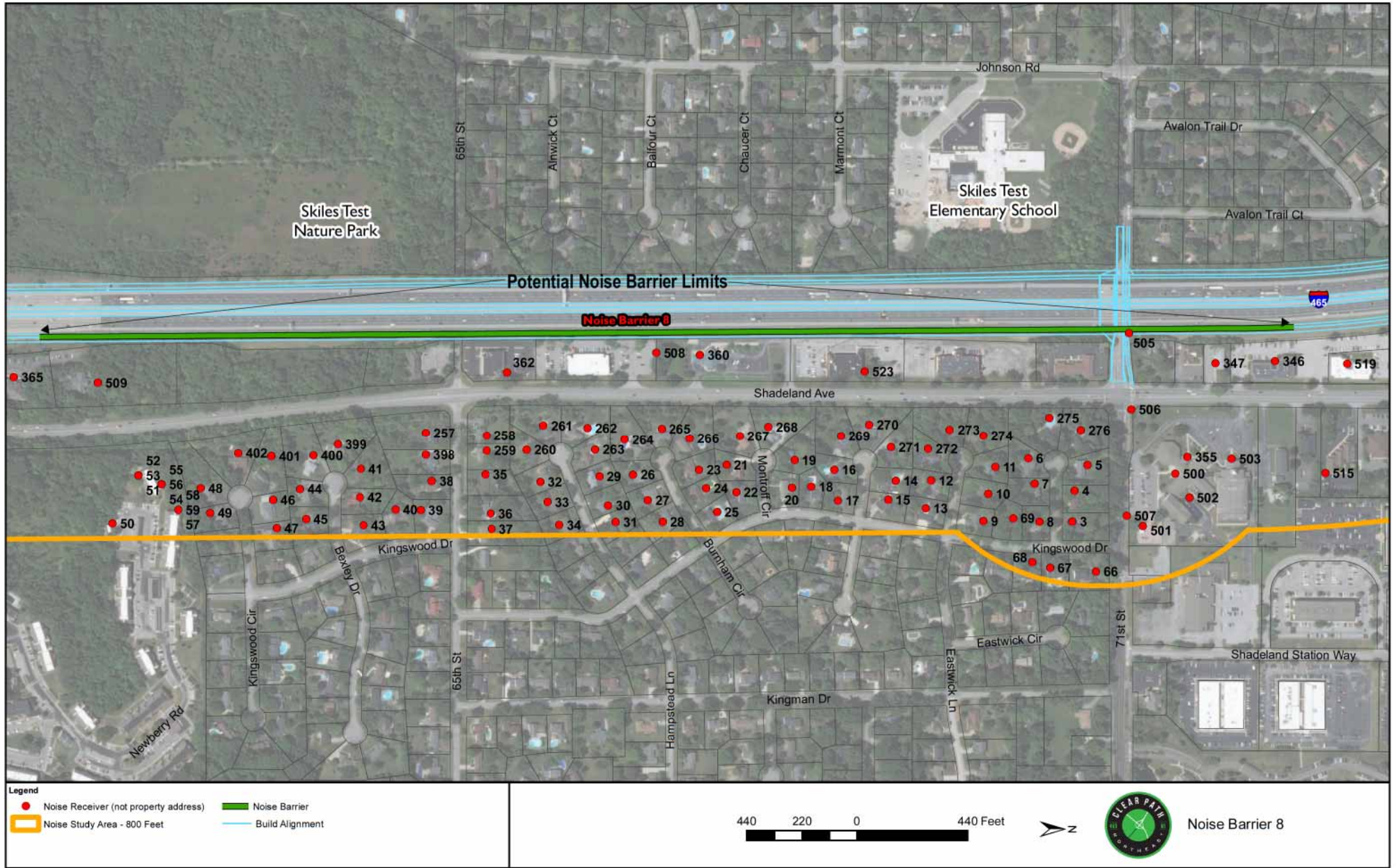
Enclosed is a map showing the location of the potential noise barrier and a survey postcard. We request that you either bring the postcard to the meeting or mail the completed postcard to the address on the postcard by August 21, 2019. Without input from the majority of nearby property owners, the noise barriers may not be warranted per INDOT noise policy. Therefore, it is very important that you submit the survey postcard.

We look forward to meeting with you on **Wednesday, August 7, 2019**. Should you have additional questions regarding this meeting, please contact Dan Miller, Environmental Service Manager with Parsons at (317) 616-4663 or via e-mail at Daniel.J.Miller@parsons.com.

Sincerely,



Daniel J. Miller
Environmental Service Manager
Parsons



Parsons
Clear Path 465 Project
Attn: Daniel J. Miller
101 West Ohio Street, Suite 2121
Indianapolis, Indiana 46204

Noise Barrier Survey Card

Thank you for completing this survey card. Please only fill out one card per household.

Name (please print): _____

Mailing Address: _____

Property Address:
(if different than above) _____

Are you the property owner? _____

Yes, I want the noise barrier to be constructed.

No, I do not want the noise barrier to be constructed.

Comments:

CLEAR PATH 465 - JULY 2019 NOISE BARRIER SURVEY

NOISE BARRIER	PROPERTY OWNERS RECEIVING LETTER			TOTAL SURVEY RESPONSES RECEIVED	SUPPORT CONSTRUCTION OF NOISE BARRIER?		SUPPORT CONSTRUCTION OF NOISE BARRIER?		TOTAL RESPONSES SUPPORTING CONSTRUCTION
	BUSINESS	RESIDENTIAL	TOTAL		BUSINESS YES	BUSINESS NO	RESIDENTIAL YES	RESIDENTIAL NO	
8	15	83	98	68	7	5	56	0	63