I-290

Phase I Study

West of US 45 (Mannheim Road) to Racine Avenue

Traffic Noise Analysis
Volume 1

Oak Park Area

August 2015

Technical Memorandum

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Section One: Introduction

This traffic noise analysis has been prepared to evaluate traffic noise for the Eisenhower Expressway (I-290) Reconstruction Project. The noise study area, shown in Figure 1, is in within the Villages of Hillside, Westchester, Bellwood, Broadview, Maywood, Forest Park, Oak Park, and the City of Chicago in Cook County, Illinois. The noise study evaluates existing and future traffic noise conditions[1], and if appropriate, will evaluate potential noise abatement measures.

This Volume 1 noise report presents only the analysis of the existing and future No Build conditions for noise receptors associated with the Village of Oak Park. The Volume 1 noise report is divided into sections as follows: Noise Background and Regulations (Section 2); Noise Receptor Selection (Section 3), Field Noise Measurements (Section 4), Noise Analysis Methodology (Section 5), Traffic Noise Model Results (Section 6), and conclusions and next steps (Section 7). Volume 2[2] of the traffic noise analysis will present impacts and abatement analysis for the Build condition, an analysis of currently undeveloped lands within the noise study area, and a discussion of construction noise considerations.

Section 2: Noise Background and Regulations

Noise Background

Sound is a pressure fluctuation in air, transmitting mechanical energy caused by vibration. Loudness is measured on a logarithmic scale using units of decibels (dB). Sound is composed of a wide range of frequencies; however, the human ear is not uniformly sensitive to all frequencies. Therefore, an "A" weighted scale was devised to correspond with the sensitivity of the human ear. The A-weighting generally weights more heavily noise levels in the humanly audible range and screens out noise levels that cannot be heard but are still generated, such as by a high-frequency dog whistle. The A-weighted scale is used because:

1) It is easily measured.
2) It approximates the sensitivity of the human ear to sounds of different frequencies.
3) It matches attitudinal surveys of noise annoyance better than other noise measurements.
4) It has been adopted as the basic unit of environmental noise by many agencies around the world for community noise issues.

The equivalent sound level (L_{eq}) is the steady-state, A-weighted sound level that contains the same amount of acoustic energy as the actual time-varying, A-weighted sound level over a specified period. If the period is 1 hour, the descriptor is the hourly equivalent sound level or $L_{eq}(h)$, which is widely used by state highway agencies as a descriptor of traffic noise. It is generally the equivalent level of sound (in dB(A)) that represents the level of sound, held constant

[1] This report provides results for the Oak Park section of the corridor only.
[2] Available by 8/27/15

over a specified period, that reflects the same amount of energy as the actual fluctuating noise over that period. L_{eq} is based on the energy average, not a noise level average.

Federal Regulations

Traffic noise analyses are required for all projects considered a Type I project. The Federal regulations define Type I projects as any of the following:

- The construction of a highway on new location,
- The physical alteration of an existing highway where there is either:
    - Substantial Horizontal Alteration. A project that halves the distance between the traffic noise source and the closest receptor between the existing condition to the future build condition or
    - Substantial Vertical Alteration. A project that removes shielding therefore, exposing the line-of-sight between the receptor and the traffic noise source. (This is done by either altering the vertical alignment of the highway or by altering the topography between the highway traffic noise source and the receptor.)
- The addition of a through-traffic lane(s). (This includes the addition of a through-traffic lane that functions as a HOV lane, High-Occupancy Toll (HOT) lane, bus lane, or truck climbing lane.)
- The addition of an auxiliary lane, except for when the auxiliary lane is a turn lane,
- The addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange,
- Restriping existing pavement for the purpose of adding a through-traffic lane or an auxiliary lane, or,
- The addition of a new or substantial alteration of a weigh station, rest stop, ride-share lot or toll plaza.

This proposed improvement to I-290 would be characterized as a Type I noise project as each of the remaining Build Alternatives includes the addition of through-traffic lanes.

Federal regulations establish noise abatement criteria to establish noise levels where noise abatement should be evaluated. Five separate noise abatement criteria (NAC) based upon land use are used by the FHWA to assess potential noise impacts. A traffic noise impact occurs when noise levels approach (within 1 dB(A)) or exceed the NAC listed in Table 1.[3] In determining the applicable noise activity category for the study area, existing land use was reviewed. The applicable NAC for all residential noise receptors evaluated is 67 dB(A).

[3] Based on 23 Code of Federal Regulations Part 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise. (adopted 2010).

TABLE 1
NOISE ABATEMENT CRITERIA - HOURLY WEIGHTED SOUND LEVEL

Activity Category[1]	$L_{eq}(h)$	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, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails and trail crossings.
D[4]	52	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, 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.

IDOT Policy

Based on the FHWA regulations, State Highway Authorities are allowed to define the noise impacts as 1) the build condition noise level determined to approach the NAC and 2) the increase in build noise levels determined to be a substantial increase from existing noise levels. The Illinois Department of Transportation (IDOT) defines noise impacts as follows:

- Design-year traffic noise levels approach, meet or exceed the NAC, with approach defined as 66 dB(A) for the residential NAC of 67 dB(A).
- Design-year traffic noise levels are a substantial increase over existing traffic-generated noise levels, defined as an increase greater than 14 dB(A).

[4] FHWA does not determine interior noise impacts for residential land uses. An interior noise analysis is completed only if no exterior areas of frequent human use exist.

Section 3: Noise Receptor Selection

Receptor locations are selected to reflect changes in traffic noise levels as a result of changes in traffic volumes, speed, composition (trucks and cars), roadway alignment (horizontal and vertical), number of lanes, shielding, and ground cover. The distance to I-290 from the receptor was the primary factor used to select receptors for this project and was limited to receptors within 500 feet of the proposed improvements. The distance of 500 feet is based on FHWA's 2010 performance evaluation of the Traffic Noise Model (TNM) 2.5, the model that will be used to predict existing, no build, and build noise levels for the proposed project. The evaluation found that TNM is most accurate when used to assess receptors within 500 feet of the roadway, and that TNM under-predicted sound levels for "soft" ground types (turf) and over-predicted sound levels for "hard" ground types (pavement) for receptors farther than 500 feet from the roadway.[5] The IDOT Highway Traffic Noise Assessment Manual (2011) states that noise receptors should be screened within 500 feet of the roadway, based upon the findings of the FHWA 2010 performance evaluation.

The traffic noise analysis evaluates the study area using common noise environments (CNEs). A CNE is a group of receptors within the same activity category that are exposed to similar noise sources and levels. Within each of the CNEs, the closest receptor was selected to represent the CNE, thereby representing the worst-case traffic noise condition. The represented receptors within the CNEs will have similar traffic noise levels as the selected receptor.

Table 2 lists the receptor number, location, receptor type, and the approximate distance to the existing I-290 edge of pavement.[6] Figure 3 depicts aerial photographs of each representative receptor and its corresponding CNE. The figure shows "primary" and "secondary" land use classifications used to identify the Land Use Activity Category for each area within the project corridor. This distinction was made because the land uses in the project area are urban and sometimes have multiple land uses within a single building. Buildings with more than one land use that could be represented by multiple Activity Categories were designated with "Primary" and "Secondary" land uses that were used to determine traffic noise impacts. For instance, a single building could contain a café with sidewalk seating on the first floor, with residential on the second floor (with an outdoor balcony) that could be considered either Activity Category B (residential) or E (restaurant). "Primary" land uses represent the most noise-sensitive land use in that building, and represent the land use category that will be used for traffic noise impacts determination.

For example, residential land use/Activity Category B has a lower NAC (67 dB(A)) than restaurants/Activity Category E (72 dB(A)); therefore the "primary" land use category for that site would be Activity Category B (NAC of 67 dB(A)). "Secondary" land uses are shown as a hatching over the "Primary" land use to indicate the other uses in the building that have NAC, but the NAC is greater than or equal to that of the primary land use. In the example given, Activity Category E (NAC of 72 dB(A)) would be the category of the "secondary" land use.

[5] U.S. Department of Transportation Research and Innovative Technology Administration. "Ground and Pavement Effects using FHWA's Traffic Noise Model 2.5." April 2010.

[6] Receptor data is listed for receptors within the Village of Oak Park

The existing land use adjacent to the entirety of the I-290 corridor is urban, comprised mainly of residential use, with sections of industrial, commercial, office, cemetery, and parks/recreational uses interspersed. The study area contains a wide variety of land uses, as represented in Table 2[7]. There were no identified land uses in the project area that would be classified as Activity Category A. Table 1 defines Activity Category A as "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." An example of this is the Tomb of the Unknown Soldier located at the Arlington National Cemetery in Washington D.C. Very few areas qualify to be Activity Category A. For this analysis, parks in the I-290 study area were designated as Activity Category C, a typical designation for a park. The IDOT traffic noise policy states noise receptors in parks exist at outdoor gathering areas, such as a baseball field, playground equipment, or a bench. It is recognized that there are notable parks in the study area, including Columbus Park (between Austin Boulevard and Central Avenue), which is listed in the National Register of Historic Places; however, the park is presently located adjacent to the I-290 corridor, and none of the park's uses appear to be restricted by its proximity to I-290 and the existing highway noise.

Activity Category D is the only activity category for which interior noise is studied. The IDOT traffic noise policy states that primary consideration should be given to exterior areas where frequent human use occurs for Activity Categories A, B, C, and E. The policy states that consideration should be given to Activity Category D land uses only if no exterior use areas are identified. No Activity Category D areas were found to exist within the project corridor. In the I-290 noise study area, exterior use areas were identified for all Activity Category D land uses in the corridor (see Table 1 for a list of all Activity Category D land uses). No recording, radio, or television studios were identified within the noise study area.

Noise receptors were located using aerial photography and field investigations to determine exterior areas of frequent human use, such as balconies, benches, or other gathering places, in accordance with the IDOT traffic noise policy. Receptors were studied on each floor of multi-story buildings where outdoor areas of frequent human use existed (such as balconies on every story of a multi-story apartment building) in order to determine which floor of the building constituted the worst-case noise level for the building. Noise level results (in Section 6) present only the worst-case receptor per building.

[7] This report shows data only for the Village of Oak Park.

TABLE 2
IDENTIFIED NOISE RECEPTORS[8]
INTERSTATE ROUTE 290: WEST OF US 45 (MANNHEIM ROAD) TO RACINE AVENUE

Receptor/CNE No.	NAC Activity Category[/a]	Type[/b]	Distance to I-290 Mainline Existing Edge of Pavement, ft.	Geographic Area
R77	C / 67	Post Office	285	Oak Park
R78	C / 67	Yoga Studio	315	
R79	C / 67	Park	70	
R79A	B / 67	SFR	115	
R80	C / 67	Veterinarian, Daycare, Dance School	250	
R81	C / 67	School	200	
R82	B / 67	Mixed Residential	75	
R83	B / 67	Mixed Residential, Office	180	
R84	B / 67	MFR	165	
R85	B / 67	MFR, Office	160	
R86	B / 67	MFR, Office	65	
R87	E / 72	Restaurant	170	
R88	B / 67	MFR, Daycare, Medical Clinic	265	
R89	E / 72	Office	55	
R90	E / 72	Restaurant, Office	300	
R91	B / 67	MFR, Restaurant	500	
R92	B / 67	Mixed Residential	180	
R93	C / 67	Conservatory	225	
R94	B / 67	Mixed Residential	50	
R95	C / 67	School	440	
R96	C / 67	Recreation	300	
R96A	C / 67	Fire Station	195	
R97	B / 67	Mixed Residential	625	
R98	C / 67	Library	155	
R99	B / 67	Mixed Residential	170	
R100	B / 67	MFR, Office, Clinic	60	
R101	C / 67	Clinic, Theater	75	
R102	B / 67	MFR, Health Care	260	
R103	C / 67	Veterinarian	270	
R104	B / 67	MFR, Spa	180	

[8] Within the Village of Oak Park

Receptor/CNE No.	NAC Activity Category[a/]	Type[b/]	Distance to I-290 Mainline Existing Edge of Pavement, ft.	Geographic Area
R105	B / 67	MFR, Office	290	Oak Park
R107	C / 67	Community Center	295	
R108	C / 67	Dance Studio	310	
R109	E / 72	Office	310	
R110	E / 72	Restaurant	310	
R111	B / 67	Mixed Residential	220	
R112	E / 72	Restaurant	390	
R113	B / 67	MFR, School	410	
R114	C / 67	Daycare	410	
R115	B / 67	MFR, Office	420	
R116	E / 72	Restaurant	280	
R117	C / 67	Park and Recreation	210	
R118	C / 67	Daycare	430	
R119	B / 67	Mixed Residential, Office	65	
R120	C / 67	Health Care	460	
R121	C / 67	Church	220	
R122	B / 67	Mixed Residential	200	
R123	C / 67	Religious Center	480	

[a/] due to many mixed-use buildings, the activity category listed is the most noise-sensitive use of the uses within that CNE.

[b/] Land uses with NAC are listed; land uses without NAC are not included.

SFR denotes Single Family Residential

MFR denotes Multiple Family Residential

Note 1: Several receptors locations have been modified since the initial Receptor Memo due to subsequent information collected.

Note 2: Several receptors are noted to be located beyond 500 feet away from the I-290 edge of pavement. These receptors are within the I-290 noise study area; however, because they are within 500 feet of other improvements associated with the I-290 project, such as interchanges or frontage roads.

SECTION 4: FIELD NOISE MEASUREMENTS

Noise level measurements provide a "snapshot" of existing site conditions. Field measurements and the data collected during monitoring are used to validate the traffic noise models used for the project alternatives, ensuring the models can accurately predict each area's noise environment. The following methodology was used to collect noise level measurements for the I-290 traffic noise analysis.

Traffic noise levels measured during monitoring events are representative of the traffic characteristics (volume, speed, and composition) for the period measured. The period measured may or may not be the peak-hour traffic condition. The monitored noise levels may be influenced by noise sources in the area other than traffic noise or the characteristics of the location that are represented in the traffic model, such as shielding afforded by existing berms or structures.

Noise monitoring for I-290 was conducted at seven receptor locations in Oak Park, representing the variety of land uses and noise environments present in the Oak Park section of the corridor. The selection of these locations was reviewed and approved by IDOT and FHWA.

Traffic Volumes

Traffic volumes on roadways adjacent to receptors were counted during each ten-minute noise monitoring period. The number of cars and trucks were recorded separately along with any other noise sources observed during monitoring. The traffic volumes counted were extrapolated to hourly volumes for entry into the traffic noise model. This procedure is accepted by FHWA as a representative noise monitoring method, detailed in the IDOT Highway Traffic Noise Assessment Manual, Section 3.5.2.

Time and Day for Measurements

Noise monitoring is typically conducted during the period representing the worst hourly noise level. This may or may not be during the peak hour traffic volumes, as traffic may be operating under stop-and-go conditions or at a reduced travel speed during the peak hour. Monitoring typically occurred during the midday off peak period of travel, when free-flow conditions were present on I-290 (generally 10:00 AM to 2:00 PM), which would generate higher sound levels as compared to congested peak hour conditions. Noise monitoring was conducted at the sites on April 9, 22, and 30, May 7, 14, 21, and 22; and October 30, 2014.

Weather Conditions

Weather conditions affect noise measurement readings. Noise measurements cannot be taken if wind speed exceeds 12 miles per hour (mph). A wind screen was used at all times during noise monitoring to reduce wind noise. The conditions during noise monitoring are summarized as follows:

WEATHER CONDITIONS DURING I-290 TRAFFIC NOISE MONITORING

	Pavement	Humidity	Temperature	Wind Speed
Required Condition	*Dry*	*Less than 90%*	*14 to 112 degrees F*	*12 mph or less*
04/09/14	Dry	32% to 61%	50 to 60 degrees F	7 mph to 11 mph
04/22/14	Dry	39% to 46%	51 to 58 degrees F	8 mph to 12 mph
04/30/14	Dry	77% to 86%	50 to 51 degrees F	10 mph to 12 mph
05/07/14	Dry	47% to 50%	72 to 77 degrees F	7 mph to 11 mph
05/14/14	Dry	57% to 69%	52 to 55 degrees F	10 mph to 12 mph
05/21/14	Dry	29% to 54%	81 to 88 degrees F	4 mph to 11 mph
05/22/14	Dry	58%	65 degrees F	7 mph to 10 mph
10/30/14	Dry	54%	51 degrees F	9 mph to 10 mph

Source: National Weather Service Data

The weather conditions during the noise monitoring were within the recommended ranges for all parameters listed.

Instrumentation

A Brüel & Kjaer Type 2250L sound level meter was used for field monitoring noise levels. The L_{eq} was recorded for the "A" weighted scale. The sound level meter was calibrated prior to use. Per IDOT policy, the sound level meter was set up approximately five (5) feet from the ground and the measurement was conducted for 10 minutes at each location. The sound level meter was placed in an outdoor location where human activity typically occurs or in a location representative of that location.

Field Noise Monitoring Results and Model Validation

To validate the noise model, the noise monitoring results are compared to existing conditions noise modeling results (Table 3). Modeled noise levels (including traffic conditions noted during monitoring) must be within 3 dB of the monitored noise levels for the model to be validated. Traffic noise modeling is completed using the FHWA-approved Traffic Noise Model (TNM 2.5).

Traffic noise monitoring occurred at seven representative receptors in the Oak Park portion of the study area, accounting for 15% of all Oak Park receptors. Due to the large number of potential receptors in the entire corridor, the percentage of receptors monitored is less than what is recommended in the IDOT traffic noise policy (25% to 50%); however, FHWA and IDOT determined that the selected I-290 monitoring locations would provide an appropriate representative survey of existing ambient noise levels in the project area, and that additional monitoring locations would be redundant. Many of the study area receptors were designated due to differences in land use (many portions of the study area are mixed-use) rather than changes in the noise environment due to elevation, location, or roadway characteristics.

Monitored noise levels for the seven monitored receptors ranged from 63 dB(A) to 78 dB(A). The difference between modeled and monitored noise levels provides an indication of noise model representativeness. For this analysis, monitored noise levels are within 3 dB(A) of the modeled noise levels, which validates the noise model per the IDOT traffic noise policy.

TABLE 3
NOISE MONITORING RESULTS, Leq[9]

Receptor	Modeled Existing Noise Level, dB(A)*	Noise Level Monitored, dB(A)	Difference Between Modeled and Monitored, dB(A)
R79	71	71	0
R85	73	75	-2
R94	70	69	1
R96	67	64	3
R107	66	63	3
R119	78	78	0
R122	68	69	-1

Note: The traffic noise impact analysis (Section 6 of this report) and abatement evaluation (Volume 2 noise report) will be conducted using the build traffic noise model results. Traffic noise impacts are not identified for existing or future no build conditions.

*Represents modeled noise levels using the existing condition traffic noise model and the traffic conditions observed in the field during the given monitoring event. The observed traffic during noise monitoring varied from the existing predicted peak-hour traffic volumes used for project development. The modeled noise levels shown in Table 3 will vary from those in Table 4 for this reason.

[9] Results shown for Oak Park monitored receptors only

SECTION 5: NOISE ANALYSIS METHODOLOGY

Traffic noise modeling at the identified receptors was conducted utilizing the FHWA-approved TNM 2.5. Prediction of noise levels is one step in assessing potential noise impacts and abatement strategies. Traffic noise levels for the receptor sites were predicted using existing and future (2040) traffic volumes. Inputs into TNM are described in the following sections, and include traffic volume, traffic mix (cars, heavy trucks, and medium trucks), traffic controls, receptor distance, elevation, and average speeds during free flowing conditions.

Traffic Volumes

Study area traffic volumes (daily and peak hour) were provided by the project's design engineering consultant for the most recent year available (considered to be the existing condition), the 2040 No Build condition, and the four build alternatives carried forward for the 2040 Build condition.

Several low-volume local streets in the project area were not included in the lead Phase I consultant's traffic analysis. In these locations, traffic volumes collected during traffic noise monitoring were used for existing conditions, and were extrapolated to 2040 for the future year conditions.

Traffic Composition

TNM traffic composition input for the project area was dependent upon the level of traffic data received from IDOT and the lead Phase I consultant, and included cars, single-unit (medium) trucks, and multi-unit (heavy) trucks. From traffic data collected in the project area, it was determined that heavy truck volumes ranged from 55% to 60% of total truck traffic throughout the corridor, with the balance of truck traffic as medium trucks.

For all conditions[10], the percentage of automobiles for the I-290 mainline is estimated to be between 93 percent and 95 percent, with combined truck traffic accounting for between 5 percent and 7 percent.

Receptor Distance/Elevation

The distance and elevation of each receptor influences the predicted traffic noise level. As shown in Table 2, in Oak Park the distances from the receptor to the I-290 edge of pavement ranges from 50 feet at Receptor R94 to 625 feet at Receptor R97. The specific location of the receptor is based upon the location where outdoor activity occurs, verified via aerial photography and field reviews.

Speed Conditions

Posted speed limits were used for speed data inputs for the noise analysis. Using posted speed limits for the analysis is a conservative approach, as current I-290 traffic has been observed to travel at lower speeds than posted speed limits due to traffic delay. Using the posted speed would

[10] All traffic composition data is reported by the entire corridor, not only the Oak Park section of the corridor.

yield higher noise level results than using travel speeds of delayed traffic. The existing speed limit for I-290 is 55 mph. All existing speed limits on other roads were projected to remain the same in the future condition.

SECTION 6: TNM RESULTS

Existing and No Build Noise Evaluation

Existing and No Build (2040) traffic noise levels were predicted for the 48 receptor sites in Oak Park utilizing TNM 2.5. Table 4 presents the Existing and No Build noise levels for the receptor sites in Oak Park, as well as the anticipated difference in noise levels for these two periods. The Existing noise levels range from 59 dB(A) at R110 and R123 to 78 dB(A) at R100 and R119. The projected No Build 2040 traffic noise levels range from 60 dB(A) at R110 and R123 to 79 dB(A) at R119. In Oak Park, receptor noise levels either remain the same from the Existing to 2040 No Build scenarios or increase by 1 dB(A).

TABLE 4
NOISE LEVELS SUMMARY – TNM MODELING RESULTS[11]

Receptor Number	NAC/ Activity Category	Existing Noise Level, dB(A)	No Build 2040 Noise Level, dB(A)
R77	C / 67	69	70
R78	C / 67	72	73
R79	C / 67	75	76
R79A	B / 67	75	76
R80	C / 67	72	73
R81	C / 67	72	73
R82	B / 67	75	75
R83	B / 67	76	76
R84	B / 67	76	76
R85	B / 67	76	76
R86	B / 67	77	77
R87	E / 72	70	71
R88	B / 67	67	68
R89	E / 72	77	78
R90	E / 72	69	70
R91	B / 67	67	68
R92	B / 67	75	75
R93	C / 67	72	72
R94	B / 67	77	77
R95	C / 67	63	63
R96	C / 67	69	69
R96A	C / 67	74	74
R97	B / 67	63	64
R98	C / 67	75	75
R99	B / 67	75	75
R100	B / 67	78	78
R101	C / 67	77	78
R102	B / 67	72	73
R103	C / 67	69	69
R104	B / 67	73	73
R105	B / 67	67	67
R107	C / 67	66	66
R108	C / 67	62	62

[11]In this version of the report, results are shown for receptors within the Village of Oak Park.

Receptor Number	NAC/ Activity Category	Existing Noise Level, dB(A)	No Build 2040 Noise Level, dB(A)
R109	E / 72	60	61
R110	E / 72	59	60
R111	B / 67	75	75
R112	E / 72	62	62
R113	B / 67	66	66
R114	C / 67	61	62
R115	B / 67	66	67
R116	E / 72	65	65
R117	C / 67	75	75
R118	C / 67	62	62
R119	B / 67	78	79
R120	C / 67	68	68
R121	C / 67	61	62
R122	B / 67	73	73
R123	C / 67	59	60

Noise Findings Relative to Mainline I-290 Traffic and Design

The elevation of I-290 relative to the receptors also influenced noise levels; areas in a "trench" (such as in Oak Park) or other areas where I-290 is at a lower elevation than the surrounding land uses typically had lower noise levels than areas at nearly the same elevation as I-290. The "trench" provides some noise shielding to the surrounding receptors.

SECTION 7: CONCLUSIONS AND NEXT STEPS

This Volume 1 report of the I-290 Traffic Noise Analysis identified receptors within Oak Park where traffic noise would be studied for the proposed project. The Volume 1 report presents the Federal and state noise regulations, a discussion of noise sensitive receptors, field noise monitoring, a description of the noise analysis methodology, and the analysis of the Existing and future No Build noise levels.

Forty-eight (48) traffic noise receptors were studied within the Village of Oak Park in the I-290 study area. Traffic noise monitoring occurred at seven Oak Park receptors, to validate the traffic noise models used for traffic noise level calculations.

The relative noise level changes from the Existing Condition to the 2040 No Build Condition are reported in Table 5 both by the change in decibels and a description of how the human ear would perceive that level of noise change. Commonly accepted principles regarding perception of noise level changes, as cited in the IDOT Highway Traffic Noise Assessment Manual, include:

± 10 dB(A) a doubling or halving of perceived noise level

± 5 dB(A) readily perceptible change

± 3 dB(A) barely perceptible change

± 1 dB(A) less than barely perceptible change

TABLE 5
RECEPTORS WITH PERCEPTABLE NOISE CHANGE
EXISTING TO NO BUILD CONDITIONS (OAK PARK ONLY)

Noise Level Perception	dB(A)	Number of Receptors
Readily Perceptible	>= +5	0
Barely Perceptible	>= +3	0
Less than Barely Perceptible	2 to -2	48
Barely Perceptible	<= -3	0
Readily Perceptible	<= -5	0
	Total	48

The table indicates that for the Oak Park receptors, the noise levels of the year 2040 No Build alternative would be perceived by the human ear similarly to those of existing condition alternative. The No Build alternative would not audibly influence noise levels compared to the Existing condition, with 100% of Oak Park receptors experiencing either no change or a change that is considered imperceptible (less than barely perceptible) to the human ear.

The Existing condition would have 35 receptors with noise levels approaching, meeting, or exceeding the NAC (73% of all Oak Park receptors). The 2040 Future No Build condition would have 36 receptors with noise levels approaching, meeting, or exceeding the NAC (75% of all Oak Park receptors). The majority of these receptors are in the first row of receptors adjacent to I-290. All of the Oak Park receptors not exceeding the NAC in the No Build condition are located beyond the first row of receptors, up to one block away from I-290.

The first row of noise receptors associated with the I-290 project in Oak Park already exceeds the NAC in the Existing and No Build conditions. The noise levels for the Build conditions will be assessed in Volume 2 of the I-290 noise analysis, and traffic noise abatement analysis (mitigation for traffic noise impacts) will occur in Volume 2 where noise levels for the Preliminary Preferred Alternative condition approaches, meets, or exceeds the NAC. Volume 2 will recommend noise barrier locations and heights that are considered feasible and reasonable per IDOT policy and that provide noise reduction benefits to as many receptors as possible. The public will then have the opportunity to decide if they support the recommended noise barriers; receptors that would be benefited by a recommended barrier are asked to vote if they support the barrier in a process called "viewpoints solicitation." Multiple public forums are expected to be held in advance of the viewpoints solicitation so that residents may discuss the recommended barriers with the I-290 project team.

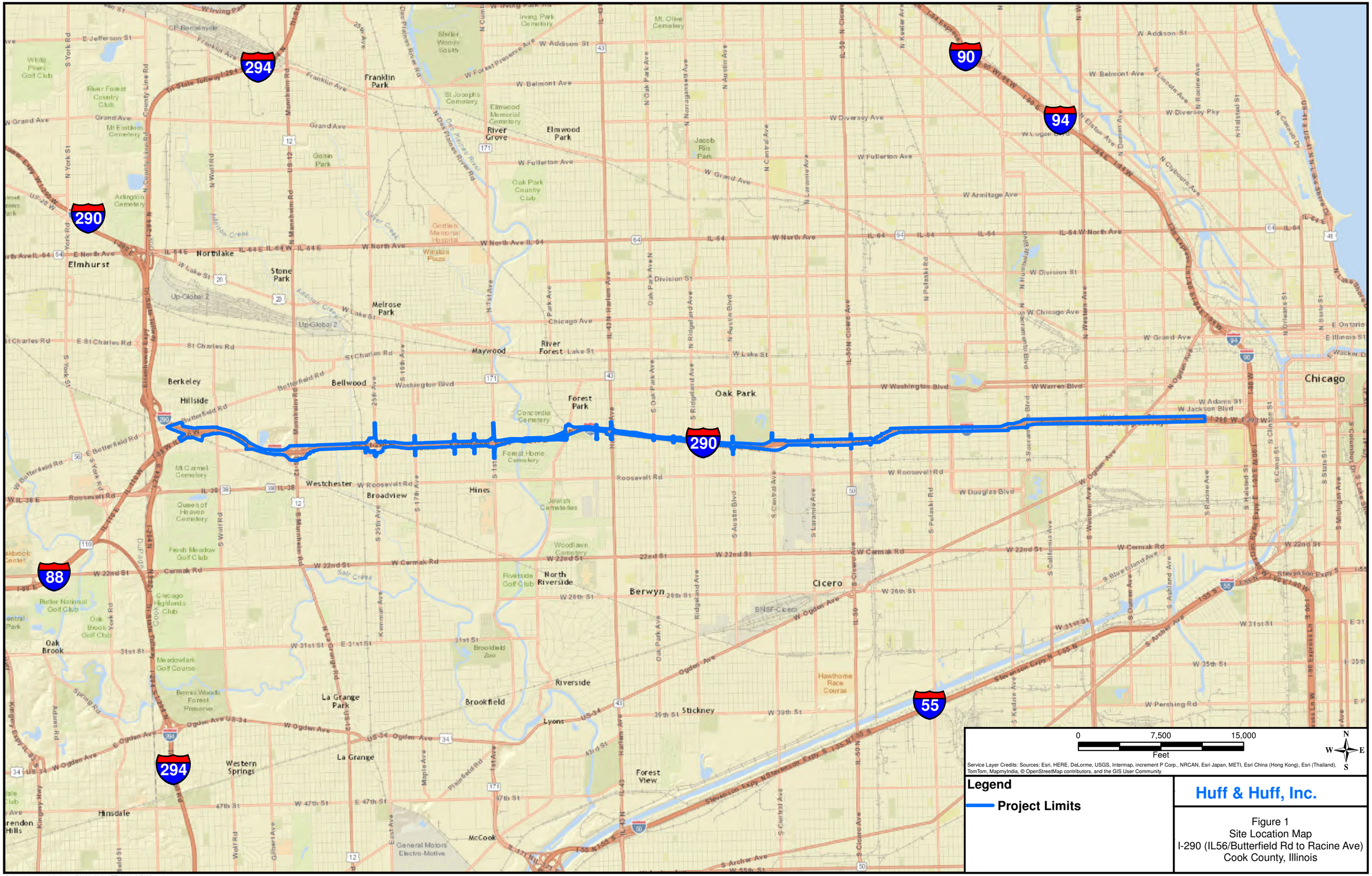

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Figure 1
Site Location Map
I-290 (IL56/Butterfield Rd to Racine Ave)
Cook County, Illinois

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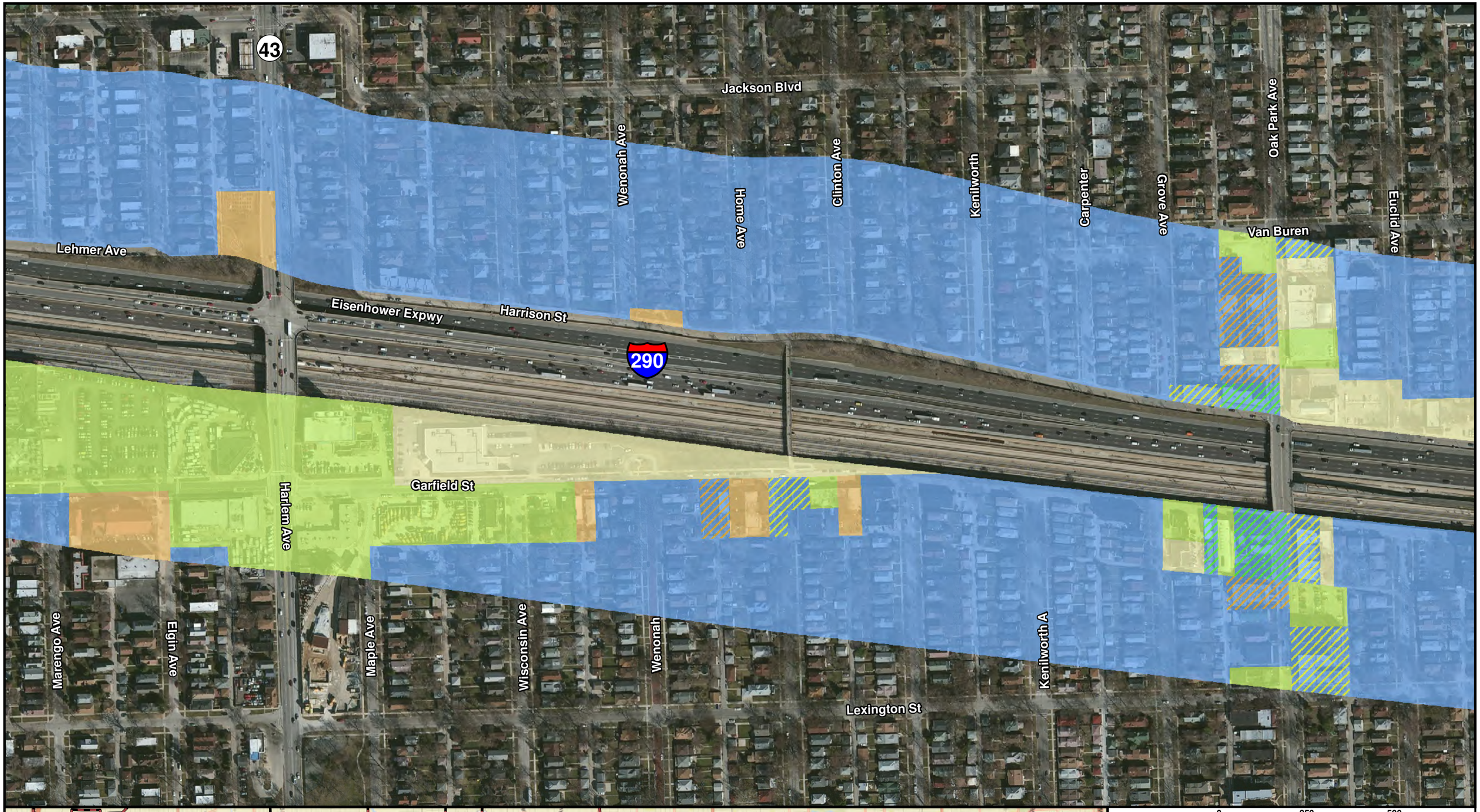
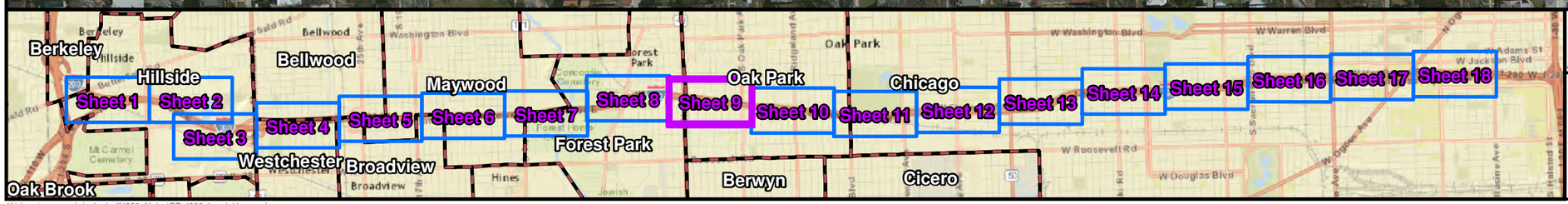




0 250 500
Feet

N W E S

Aerial Source: USDA-FSA-APFO NAIP MrSID Mosaic, 2012

Legend

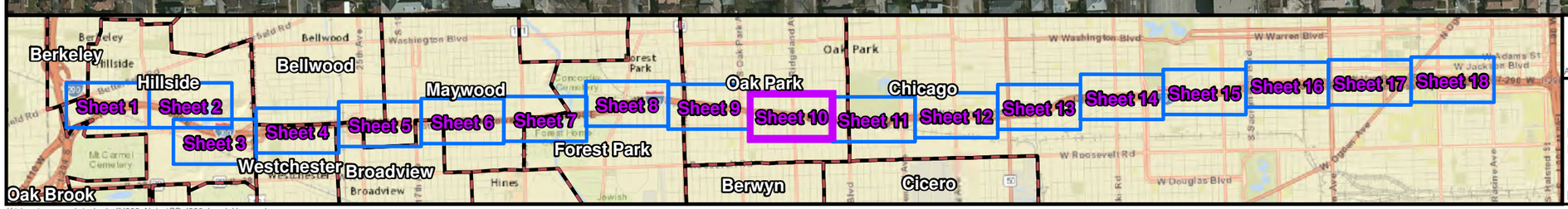
Primary Land Use Activity Category	Secondary Land Use Activity Category
B	C
C	E
E	F
F	Municipal Boundary
G	

Huff & Huff, Inc.

Figure 2
Existing Land Use Map
I-290 (IL56/Butterfield Rd to Racine Ave)
Cook County, Illinois
Sheet 9 of 18

K:\dwgs\parsons-brinckerhoff\I290_Noise\PB_I290_Land_Use.mxd

Van Buren
East Ave
Scoville Ave
Highland Ave
Lombard Ave
Taylor Ave
Harrison St
290
Eisenhower Expwy
Flournoy St
Garfield St
Lexington St
Wesley Ave
Clarence Ave
Gunderson Ave
Elmwood Ave
Ridgeland Ave
Cuyler Ave
Harvey Ave
Harvard St



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Feet

N W E S

Aerial Source: USDA-FSA-APFO NAIP MrSID Mosaic, 2012

Legend

Primary Land Use Activity Category	Secondary Land Use Activity Category
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C	E
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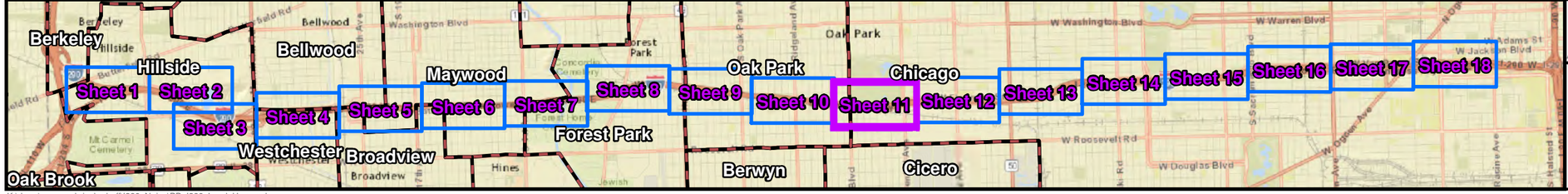
I-290 (IL56/Butterfield Rd to Racine Ave)
Cook County, Illinois
Sheet 10 of 18

K:\dwgs\parsons-brinckerhoff\I290_Noise\PB_I290_Land_Use.mxd



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Feet

N W E S

Aerial Source: USDA-FSA-APFO NAIP MrSID Mosaic, 2012

Legend

Primary Land Use Activity Category	Secondary Land Use Activity Category
B	C
C	E
E	F
F	Municipal Boundary
G	

Huff & Huff, Inc.

Figure 2
Existing Land Use Map
I-290 (IL56/Butterfield Rd to Racine Ave)
Cook County, Illinois
Sheet 11 of 18

K:\dwgs\parsons-brinckerhoff\I290_Noise\PB_I290_Land_Use.mxd

Jackson Blvd
Wenonah Ave
Home Ave
Clinton Ave
Kenilworth
Carpenter
Grove Ave
Oak Park Ave
Euclid Ave
Van Buren
Lehmer Ave
Eisenhower Expwy
Harrison St
290
Garfield St
Harlem Ave
Marengo Ave
Elgin Ave
Maple Ave
Wisconsin Ave
Wenonah
Kenilworth A
Lexington St
R75
R76
R76A
R77
R78
R79
R79A
R80
R81
R82
R83
R84
R85
R86
R87
R88
R89
R90
R91
Berkeley
Hillside
Bellwood
Maywood
Oak Park
Chicago
Forest Park
Westchester
Broadview
Berwyn
Cicero
Oak Brook
Sheet 1
Sheet 2
Sheet 3
Sheet 4
Sheet 5
Sheet 6
Sheet 7
Sheet 8
Sheet 9
Sheet 10
Sheet 11
Sheet 12
Sheet 13
Sheet 14
Sheet 15
Sheet 16
Sheet 17
Sheet 18

0 250 500
Feet

N
W E
S

Aerial Source: USDA-FSA-APFO NAIP MrSID Mosaic, 2012

Legend

- Noise Receptor
- Municipal Boundary
- CNE

Huff & Huff, Inc.

Figure 3
Noise Receptor Location Map
I-290 (IL56/Butterfield Rd to Racine Ave)
Cook County, Illinois
Sheet 9 of 18

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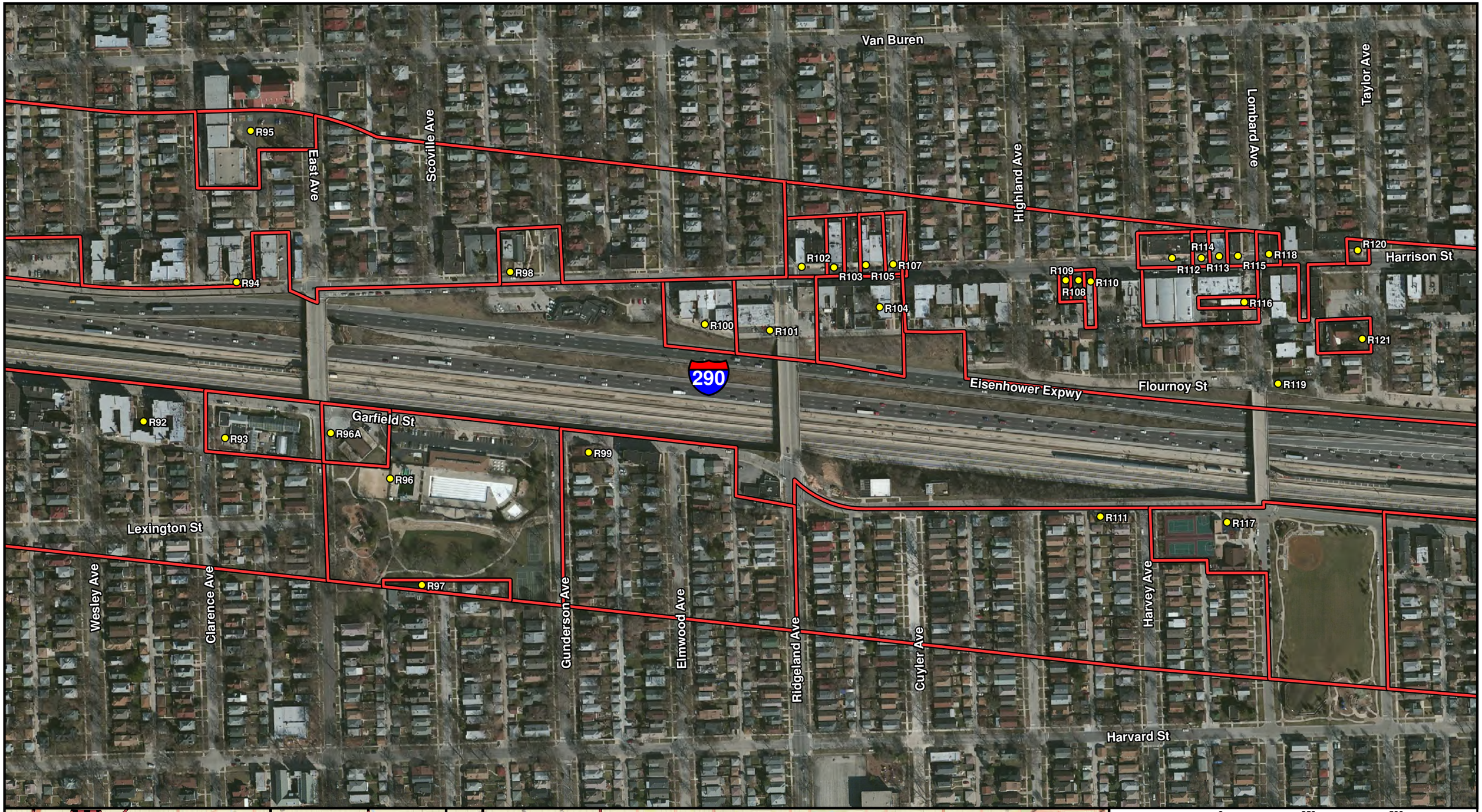

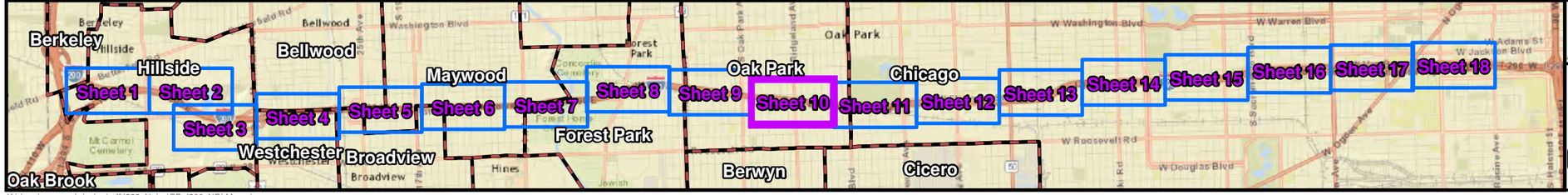

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Feet

Aerial Source: USDA-FSA-APFO NAIP MrSID Mosaic, 2012

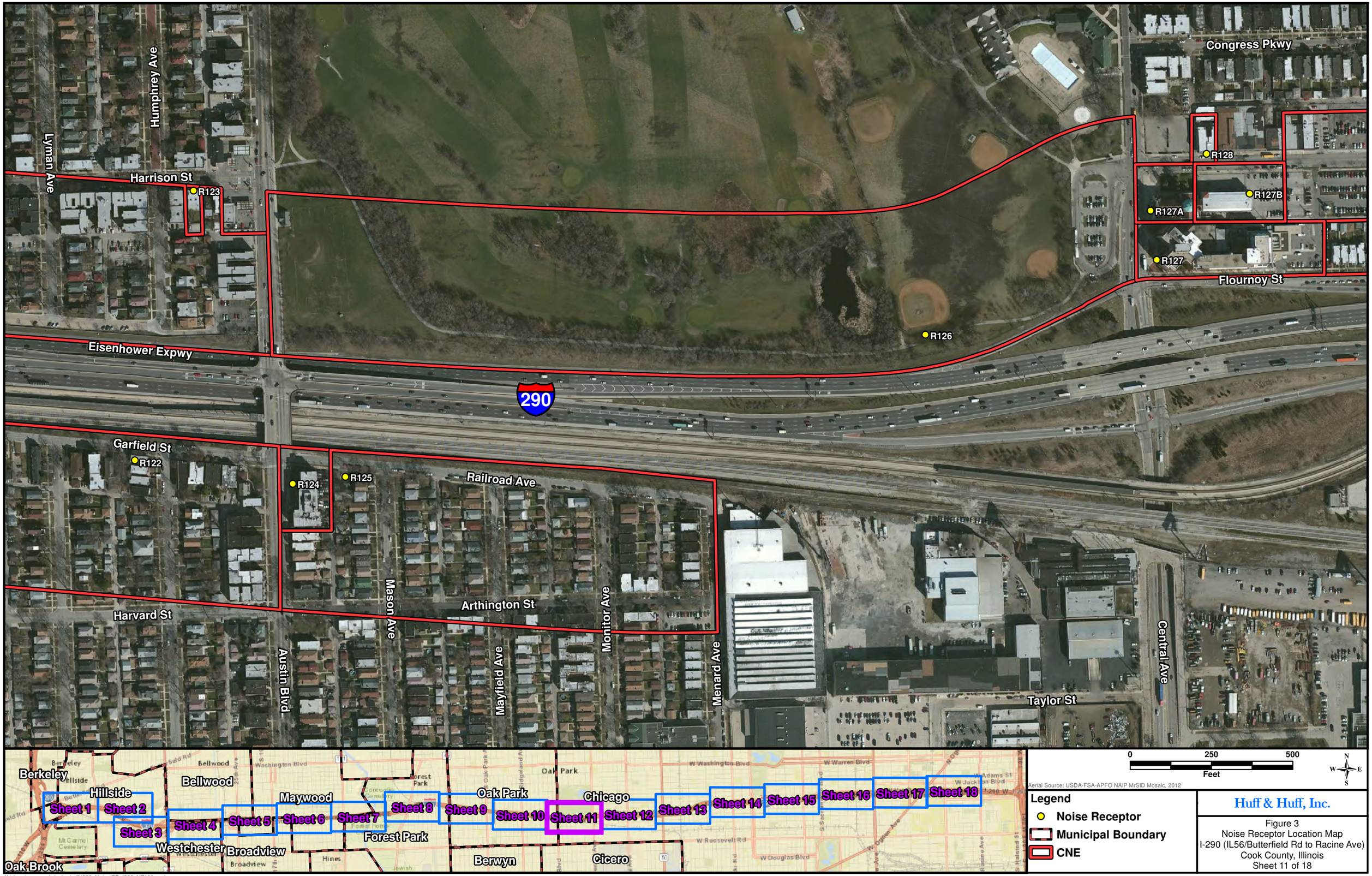
Legend

- Noise Receptor
- Municipal Boundary
- CNE

Huff & Huff, Inc.

Figure 3
Noise Receptor Location Map
I-290 (IL56/Butterfield Rd to Racine Ave)
Cook County, Illinois
Sheet 10 of 18

K:\dwgs\parsons-brinckerhoff\I290_Noise\PB_I290_NRLM.mxd



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Noise Receptor Location Map
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