



# I-94 Maple Grove to Rogers Community Noise Engagement Meeting #2

# Agenda

- Project Update
- Noise Engagement Objectives
- Summary of 1<sup>st</sup> Noise Meeting
- Noise Standards
- Noise Monitoring Results
- Noise Level Modeling Results
- Questions/Comments
- Next Steps
  - CNE Meeting #3 – Late October
  - Voting Process - early 2019

# Project Update

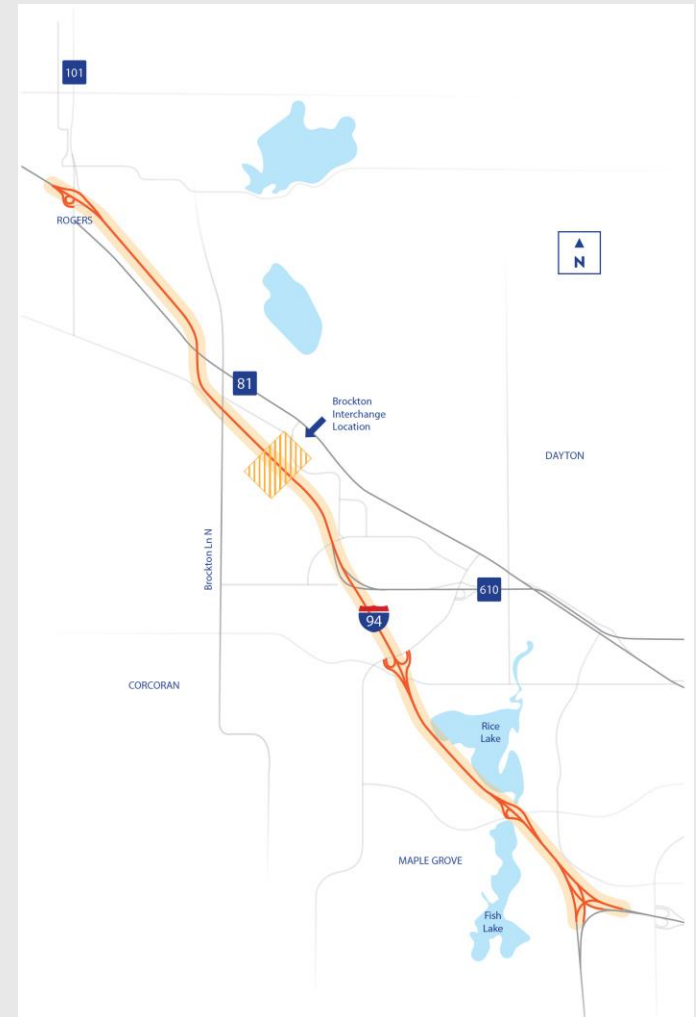
## Environmental Assessment

- Nearing draft form
- Internal MnDOT Review late 2018
- Public Comment Period early 2019
- Finalize Spring 2019

## Upcoming Engagement Opportunities

- Open House in early November
- Project website/listserv

<http://www.dot.state.mn.us/metro/projects/i94rogers/>

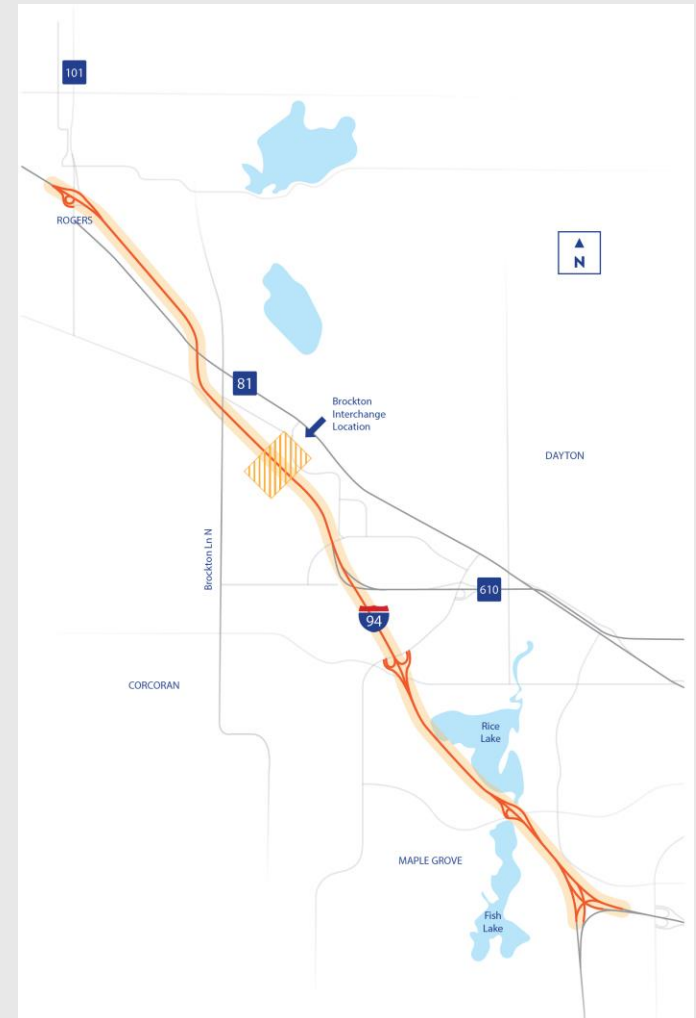


# Project Update

## Alternatives

Additional Lane: 610 to 101

Brockton Interchange Alternative:  
Diverging Diamond Interchange



# Community Noise Engagement Objectives

- Provide two-way communication between community and the MnDOT project team
- Review noise analysis methodology and results
- Communicate noise analysis and project information to your neighborhood
- Help with voter turnout for noise barrier voting

# Summary of 1<sup>st</sup> Noise Meeting

- Overview of the Noise Process
- Invitation to residents within 500 feet of the project area (over 400 mailers)
- 45 attendees – 13 NAC volunteers
- Questions about how noise is measured
- Requests for monitoring locations
- Comments about Rice Lake Noise

# Principles of Noise

- A doubling of energy, or doubling of identical sources, results in an increase of 3 dBA



2000 vehicles per hour



4000 vehicles per hour  
is 3dB louder

# Noise Level Changes

- 1 dBA (increase or decrease) = not noticeable
- 3 dBA (increase or decrease) = threshold of perception
- 5 dBA (increase or decrease) = clearly noticeable
- 10 dBA (increase or decrease) =  
perceived as twice as loud (or half as loud)

Source: Minnesota Pollution Control Agency. 2008. *A Guide to Noise Control in Minnesota*



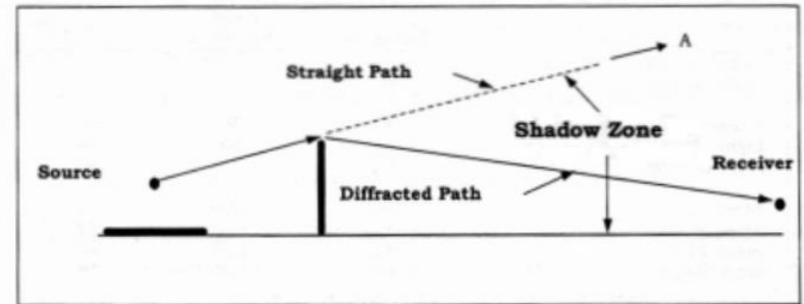
# Distance Attenuation

- Beyond approximately 50 feet from a sound source such as a highway, doubling of distance will yield:
  - Sound level decrease by 3 dBA over hard ground (pavement, water)
    - 50 feet = 70 dBA
    - 100 feet = 67 dBA
    - 200 feet = 64 dBA
  - Sound level decrease by 4.5 dBA over soft ground (vegetation)
    - 50 feet = 70 dBA
    - 100 feet = 65.5 dBA
    - 200 feet = 61.0 dBA

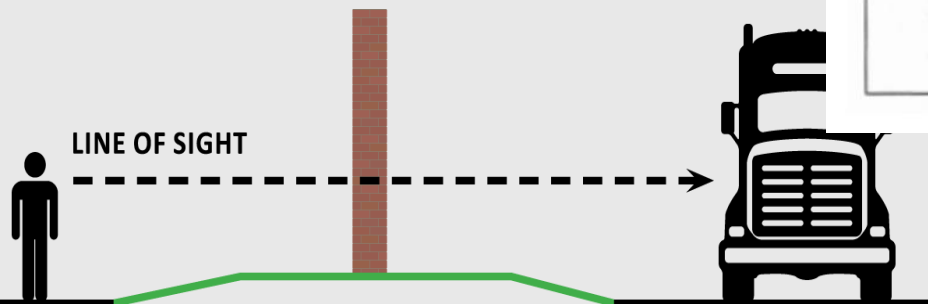
Source: Minnesota Pollution Control Agency. 2008. *A Guide to Noise Control in Minnesota*

# How do Noise Barriers Work?

- Block the direct path of sound waves from the highway (source) to adjacent residences (receptor)
- Tall and long enough to block line of sight between the highway and residences
- Will not block or eliminate all noise
- Noise barrier effectiveness considerations:
  - Distance between the source and the receptors. Noise barriers are most effective for the first and second rows of residents (~300-400 feet from highway)
  - Topography
  - Intervening features such as buildings or earthen berms

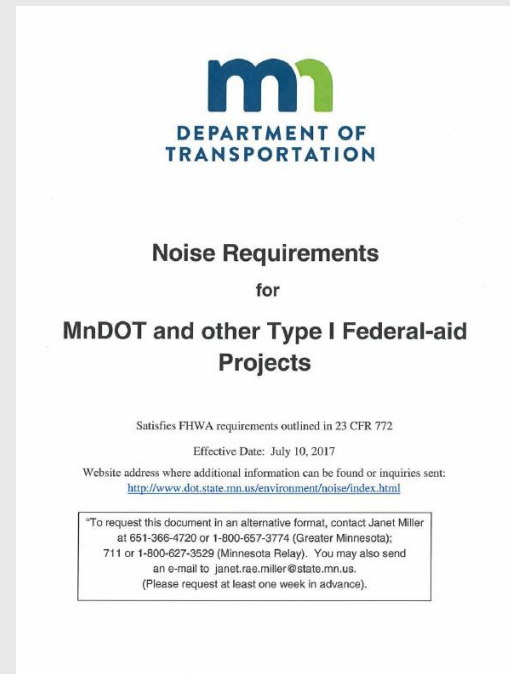


Source: Federal Highway Administration



# MnDOT Noise Requirements I

- Provides guidance for how noise analyses should be completed for MnDOT projects and other Type I projects in Minnesota
- Developed in conjunction with MPCA and FHWA
- Updated in July 2017
- Defines MnDOT's thresholds for feasibility and reasonableness of noise barriers



# MnDOT Noise Requirements II

- How does MnDOT determine where noise barriers will be constructed?
  - Is loud enough? (Impact, Noise Abatement Criteria)
  - Can a barrier be engineered at this location that effectively blocks noise? (Feasibility)
  - Does a barrier provide noticeable levels of noise reduction? (Reasonableness – Noise Reduction Design Goal)
  - Does the barrier provide noticeable levels of noise reduction for enough people to justify the cost? (Reasonableness – Cost Effectiveness)
  - Do people want a noise barrier? (Noise Barrier Voting Process)

# Noise Abatement Criteria

- Traffic Noise Impact

- Noise levels are approaching or exceeding the NAC.
  - Approaching is defined as within 1 dBA.
  - Typically looking at future Build noise levels
  - E.g., 66 dBA (Leq) for residential land uses
- Substantial noise increase
  - 5 dBA or more increase between existing noise level and future Build noise level

**Table 1 FHWA Noise Abatement Criteria**

<i>Activity Category</i>	<i>Activity Criteria<sup>1,2</sup> Leq(h) dBA</i>	<i>Evaluation Location</i>	<i>Activity Description</i>
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 <sup>3</sup>	67	Exterior	Residential
C <sup>3</sup>	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	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 <sup>3</sup>	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

Notes  
 (1) Leq(h) shall be used for impact assessment  
 (2) Leq(h) Activity Criteria values are for impact determination only, and are not design standards for noise abatement  
 (3) Includes undeveloped lands permitted for this activity category

# Traffic Noise Monitoring

- Noise Monitoring
  - Document existing noise levels in the field at representative sites
  - Count traffic volume simultaneously
  - Noise model validation (+/- 3 dBA)
  - Additional monitoring completed by MnDOT



# Field Sites Noise Measurements

AM					
Location	Date	Time	L <sub>eq</sub> (dBA)	L <sub>eq</sub> (dBA)	Difference
			Monitored	Modeled	
FS-1	6/5/2018	9:07:00	57.9	57.5	-0.4
FS-2	6/5/2018	9:47:00	75.1	74.4	-0.7
FS-3	6/5/2018	10:41:00	69.9	71.4	1.5
FS-4	6/5/2018	11:37:00	61.7	64.4	2.7
FS-6	6/5/2018	13:39:00	70.3	68.6	-1.7
FS-8	6/5/2018	14:25:00	74.1	75.2	1.1
FS-9	6/5/2018	13:39:00	70.1	72.7	2.6
FS-10	6/5/2018	12:32:00	76.5	75.1	-1.4
FS-11	6/5/2018	11:37:00	72.8	71.3	-1.5
FS-12	6/5/2018	10:41:00	66.5	68.4	1.9
FS-13	6/5/2018	10:41:00	69.9	71.4	1.5
FS-14	6/5/2018	11:37:00	61.7	64.4	2.7

# Traffic Noise Modeling

- Characteristics of roadway (horizontal and vertical alignments)
- Topography (ground lines, buildings, existing noise barriers or berms) and Ground Zones
- Receptor sites (represent residences, businesses, trails, parks, etc.)
  - Outdoor place where frequent human use occurs
  - Typically within 500 feet of the project corridor
  - Noise Abatement Criteria is defined by land use
- Existing conditions, Future No-Build, and Build conditions (generally a 20-year traffic projection)
- Loudest Hour
  - Traffic volumes and speeds
  - Vehicle types (cars, medium trucks, heavy trucks, buses, motorcycles)
- Not modeled:
  - Weather conditions
  - Surface type



# Noise Model Results Summary

<b>Modeled Year</b>	<b>Existing (2017)</b>	<b>Future No Build (2040)</b>	<b>Future Build Alternative (2040)</b>
<b>Receptors Exceed FHWA Noise Abatement Criteria</b>	113	120	126
<b>L<sub>eq</sub> Modeled Noise Level Ranges (low/high)</b>	46.9 to 80 dBA	47.5 to 80.6 dBA	47.9 to 80.9 dBA

# Noise Model Results Table












## I-94 UBOL Draft Noise Modeling Results

\*Results are not final



Receiver ID	NSA	Land Use	FHWA NAC	Number of Receptors	Existing Conditions (2017) Leq	Future No-Build (2040) Leq	Difference No-Build (2040) - Existing (2017)	Future Build (2040) Leq	Difference Build (2040) - Existing (2017)
A-1	A	Industrial	F	1	70.4	71.0	0.6	71.1	0.7
A-2	A	Industrial	F	1	70.2	70.8	0.6	70.9	0.7
A-3	A	Commercial	E	1	69.4	70.0	0.6	70.1	0.7
A-4	A	Industrial	F	1	65.7	66.4	0.7	66.6	0.9
A-5	A	Industrial	F	1	63.8	64.4	0.6	64.7	0.9
A-6	A	Commercial	E	1	68.0	68.6	0.6	68.9	0.9
A-7	A	Commercial	E	1	68.3	68.9	0.6	69.1	0.8
A-8	A	Commercial	E	1	47.9	48.4	0.5	48.7	0.8
A-9	A	Commercial	E	1	67.4	67.9	0.5	68.1	0.7
A-10 <sup>1</sup>	A	Commercial	E	1	71.6	72.2	0.6	72.4	0.8
A-11 <sup>1</sup>	A	Commercial	E	1	71.4	72.0	0.6	72.2	0.8
A-12	A	Commercial	E	1	62.6	63.2	0.6	63.4	0.8
A-13	A	Industrial	F	1	73.9	74.4	0.5	74.6	0.7
A-14 <sup>1</sup>	A	Commercial	E	1	76.6	77.1	0.5	77.3	0.7
A-15	A	Industrial	F	1	75.2	75.7	0.5	75.9	0.7
A-16 <sup>1</sup>	A	Commercial	E	1	72.6	73.1	0.5	73.3	0.7
A-17	A	Industrial	F	1	67.7	68.2	0.5	68.5	0.8
A-18	A	Industrial	F	1	72.6	73.1	0.5	73.3	0.7
A-19	A	Commercial	E	1	61.0	61.5	0.5	61.8	0.8
B-1	B	Recreational	C	1	67.7	68.2	0.5	68.5	0.8
B-2	B	Recreational	C	1	61.5	62.0	0.5	62.3	0.8
B-3	B	Commercial	E	1	65.8	66.3	0.5	66.6	0.8

# Legend

<b>Requested Monitoring</b>	<b>Receivers</b>	—	Alternative Linework
 Below 66 dBA	 Impacted (NAC B)	 Existing Noise Barriers	
 Above 66 dBA	 Impacted (NAC C)	 Study Area - 500 Ft	
<b>Field Sites</b>	 Impacted (NAC E)	 Noise Wall Analysis Areas	
 Below 66 dBA	 No Impact	 Noise Study Area Boundaries	
 Above 66 dBA			

All of the modeled preliminary noise level results are included in your handouts

# Overview Map

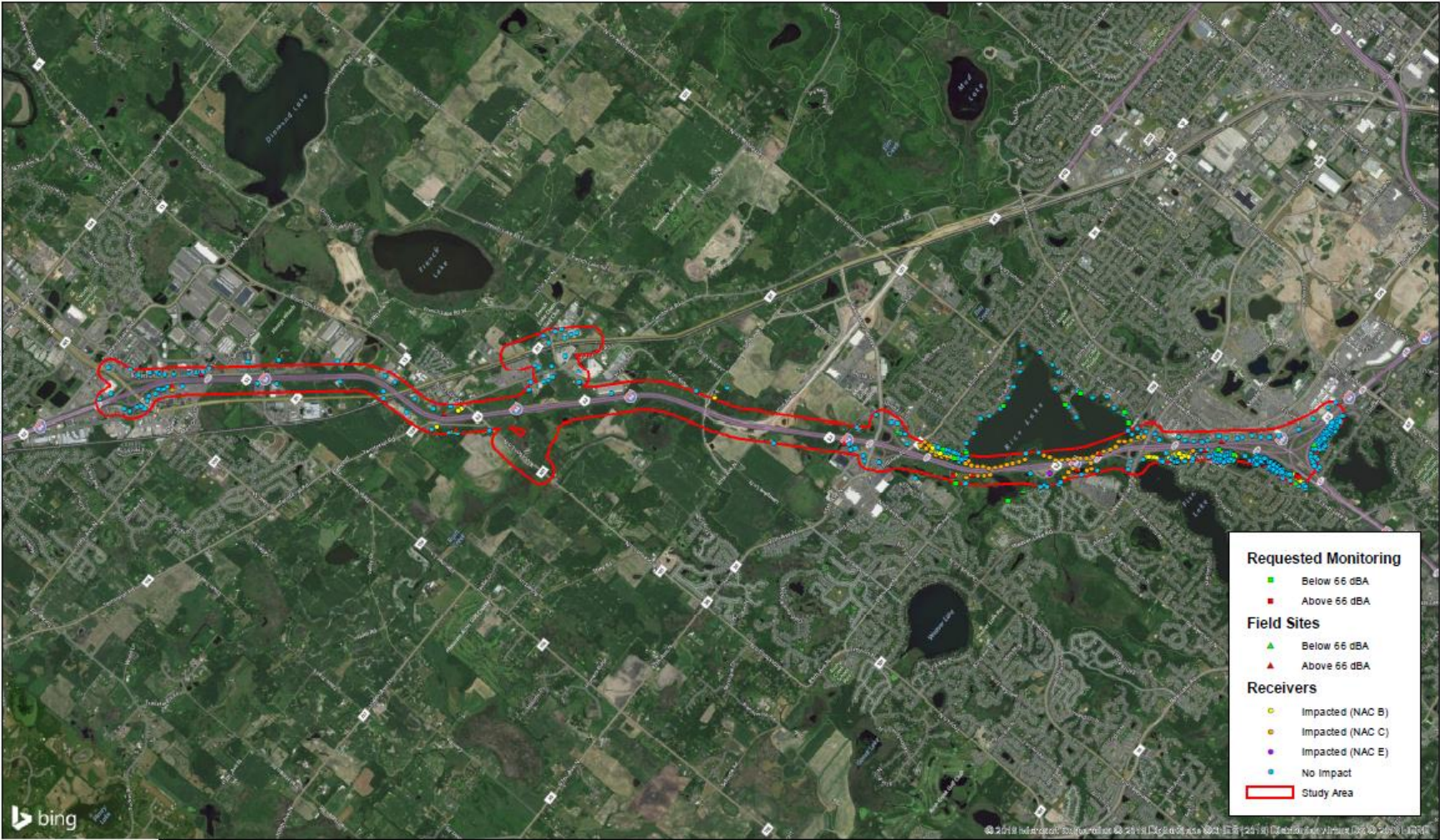




Figure 2 - Traffic Noise Study  
 I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange  
 S.P. 2780-97  
 MnDOT and City of Dayton, Minnesota



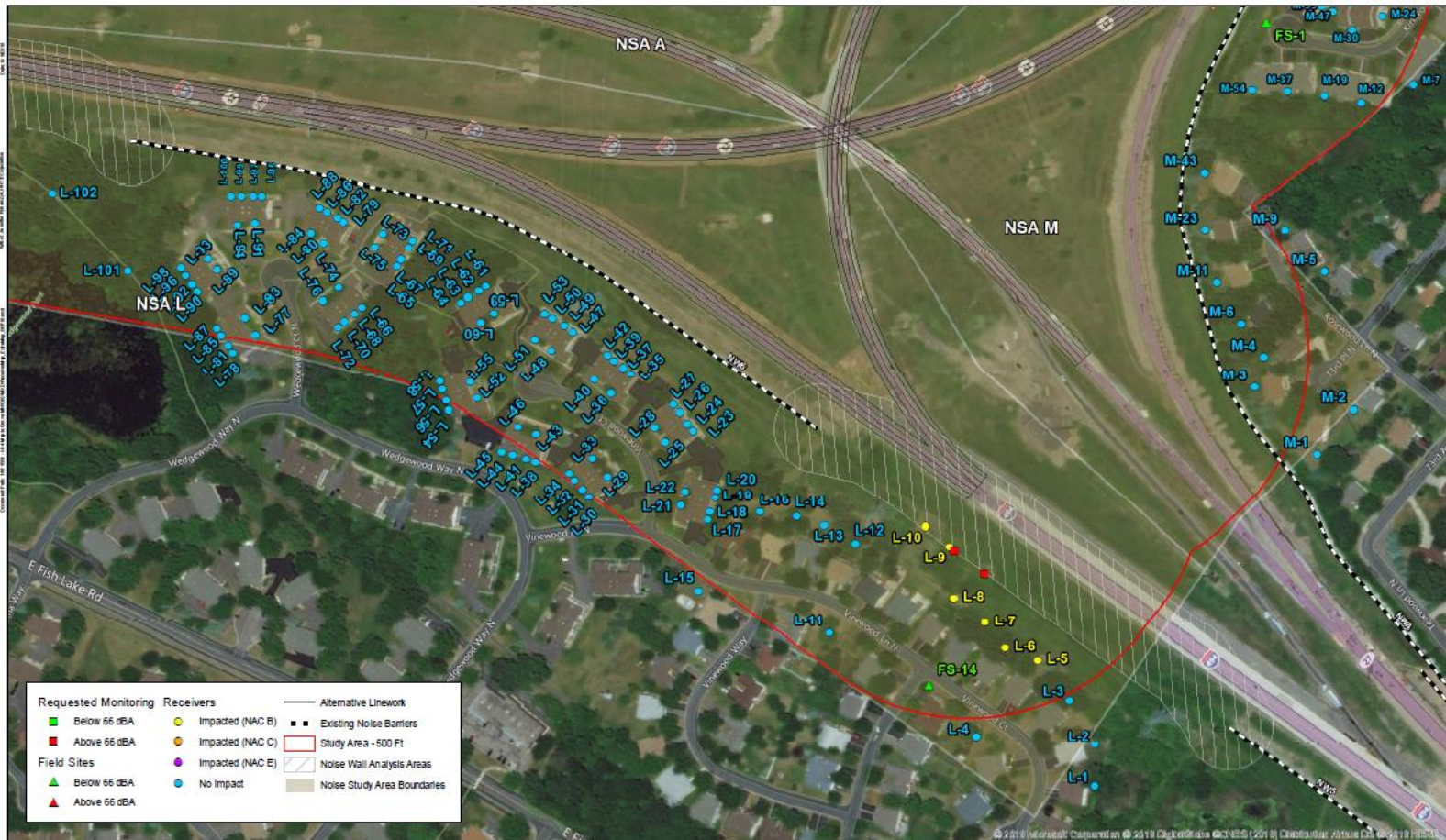


Figure 3 - Traffic Noise Study  
 I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange  
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# Fish Lake Road Residential

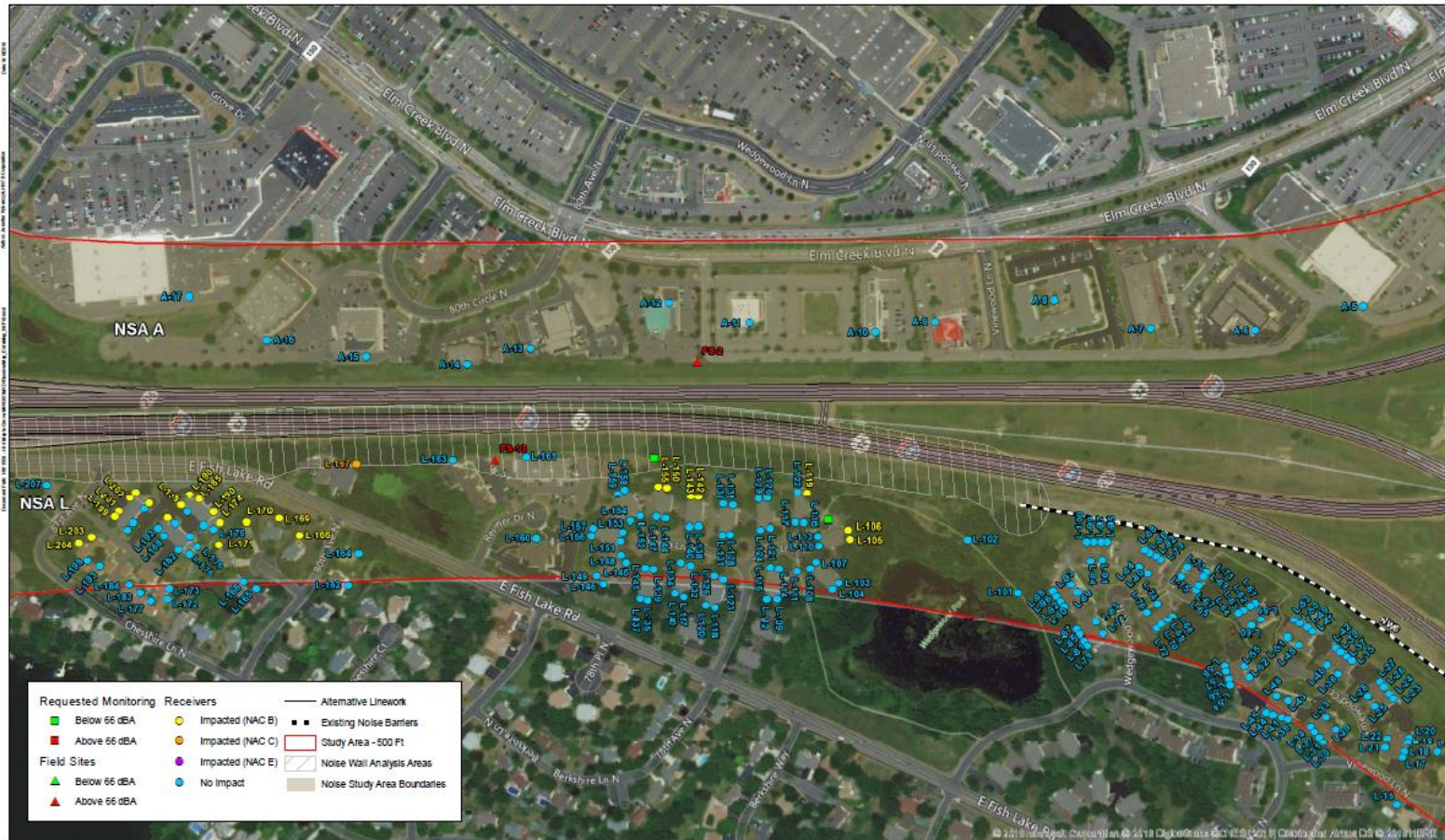
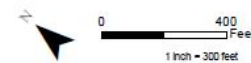


Figure 4 - Traffic Noise Study  
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# Weaver Lake Road



Figure 5 - Traffic Noise Study  
I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange  
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# Rice Lake Trail Area



Figure 6 - Traffic Noise Study  
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MnDOT and City of Dayton, Minnesota



# Rice Lake Residential Area



Figure 17 - Traffic Noise Study  
I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange  
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# Maple Grove Parkway

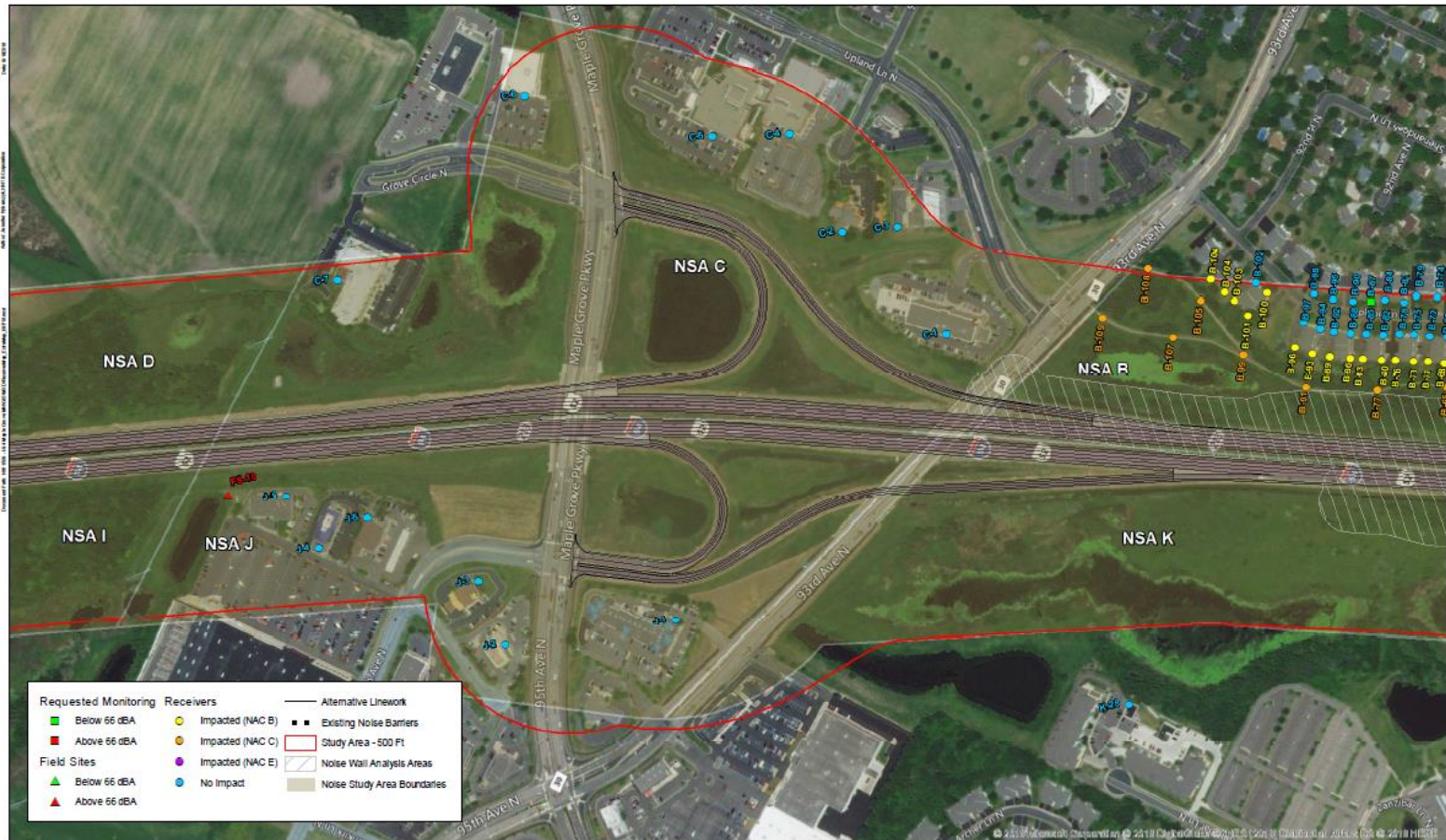
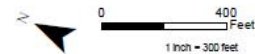


Figure 7 - Traffic Noise Study  
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# 101<sup>st</sup> Avenue



Figure 8 - Traffic Noise Study  
I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange  
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# Dayton



Figure 9 - Traffic Noise Study  
 I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange  
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# Brockton Interchange East

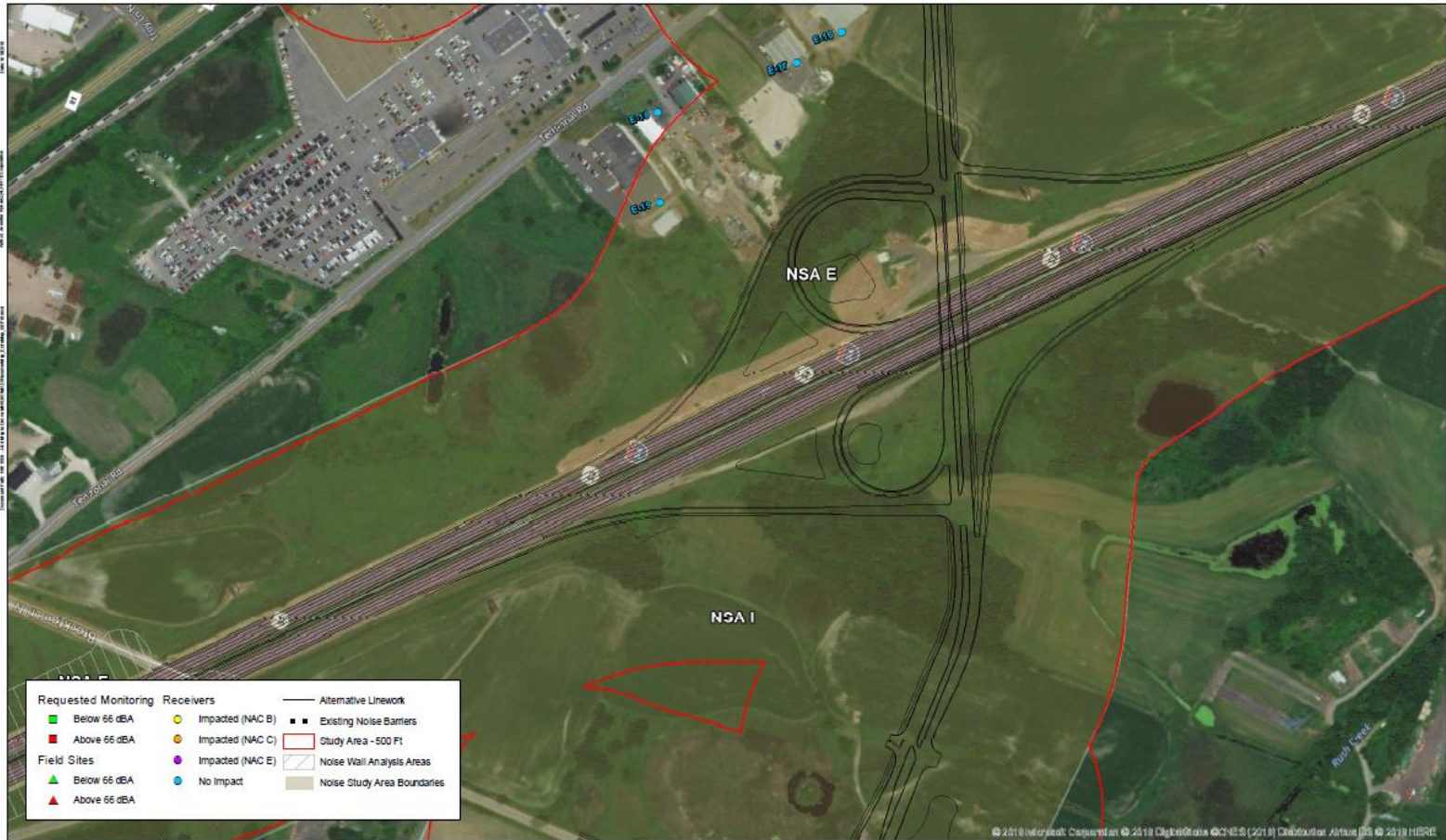


Figure 10 - Traffic Noise Study  
 I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange  
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# Brockton Interchange West



Figure 11 - Traffic Noise Study  
I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange  
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# Holly Lane/113<sup>th</sup>



Figure 12 - Traffic Noise Study  
 I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange  
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# Brockton/Territorial

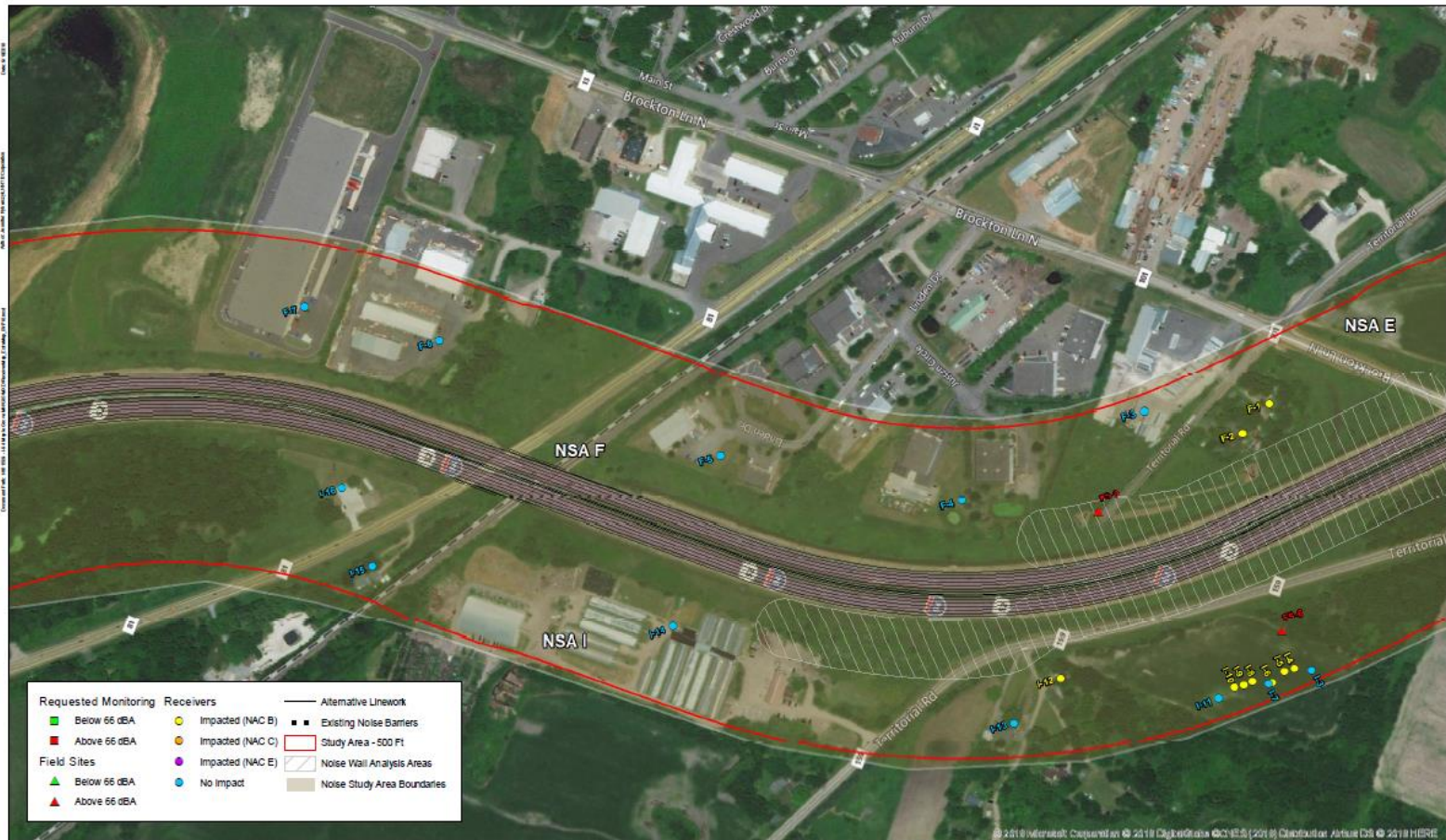
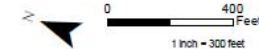


Figure 13 - Traffic Noise Study  
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# Rogers South

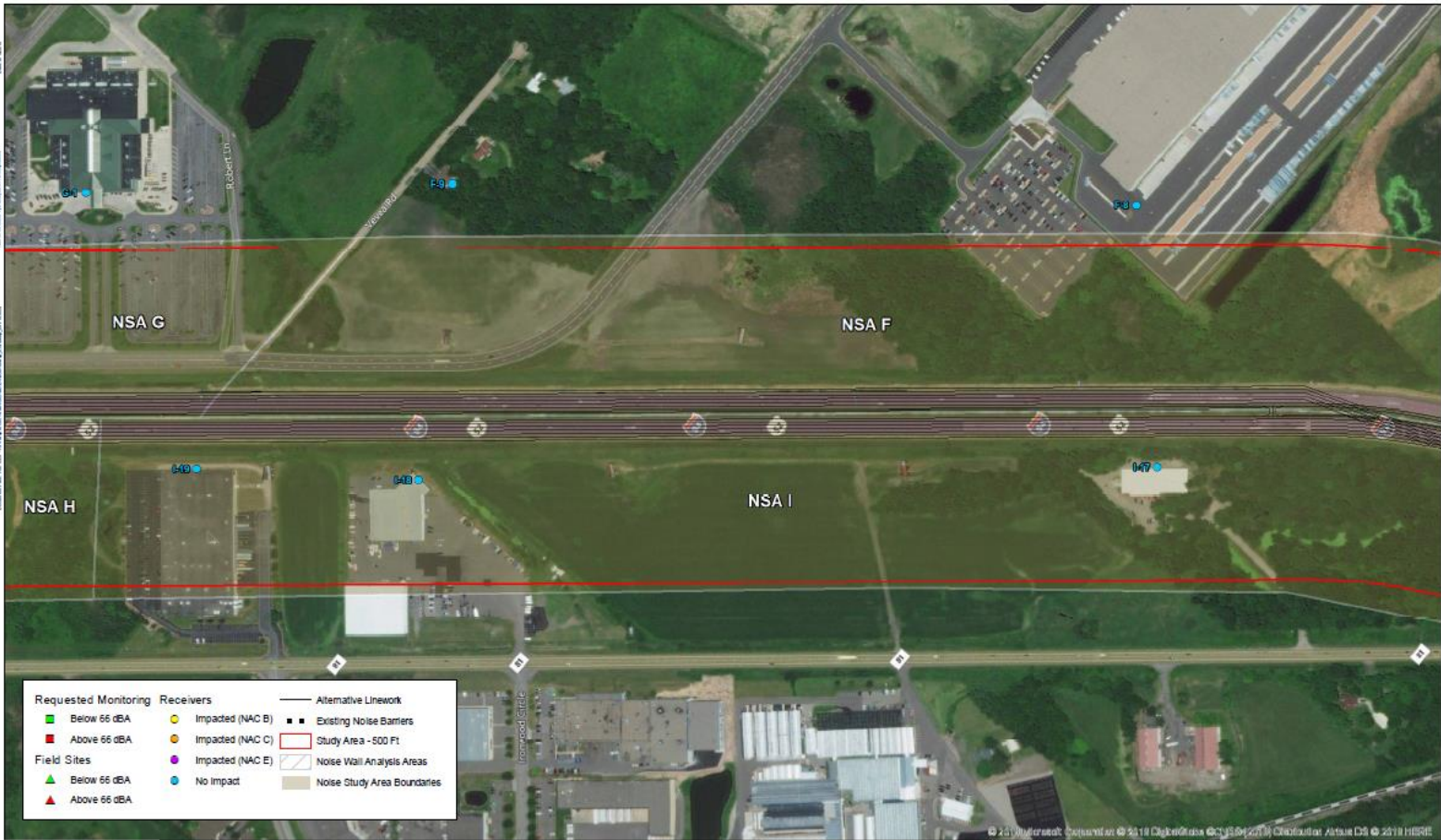


Figure 14 - Traffic Noise Study  
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Figure 15 - Traffic Noise Study  
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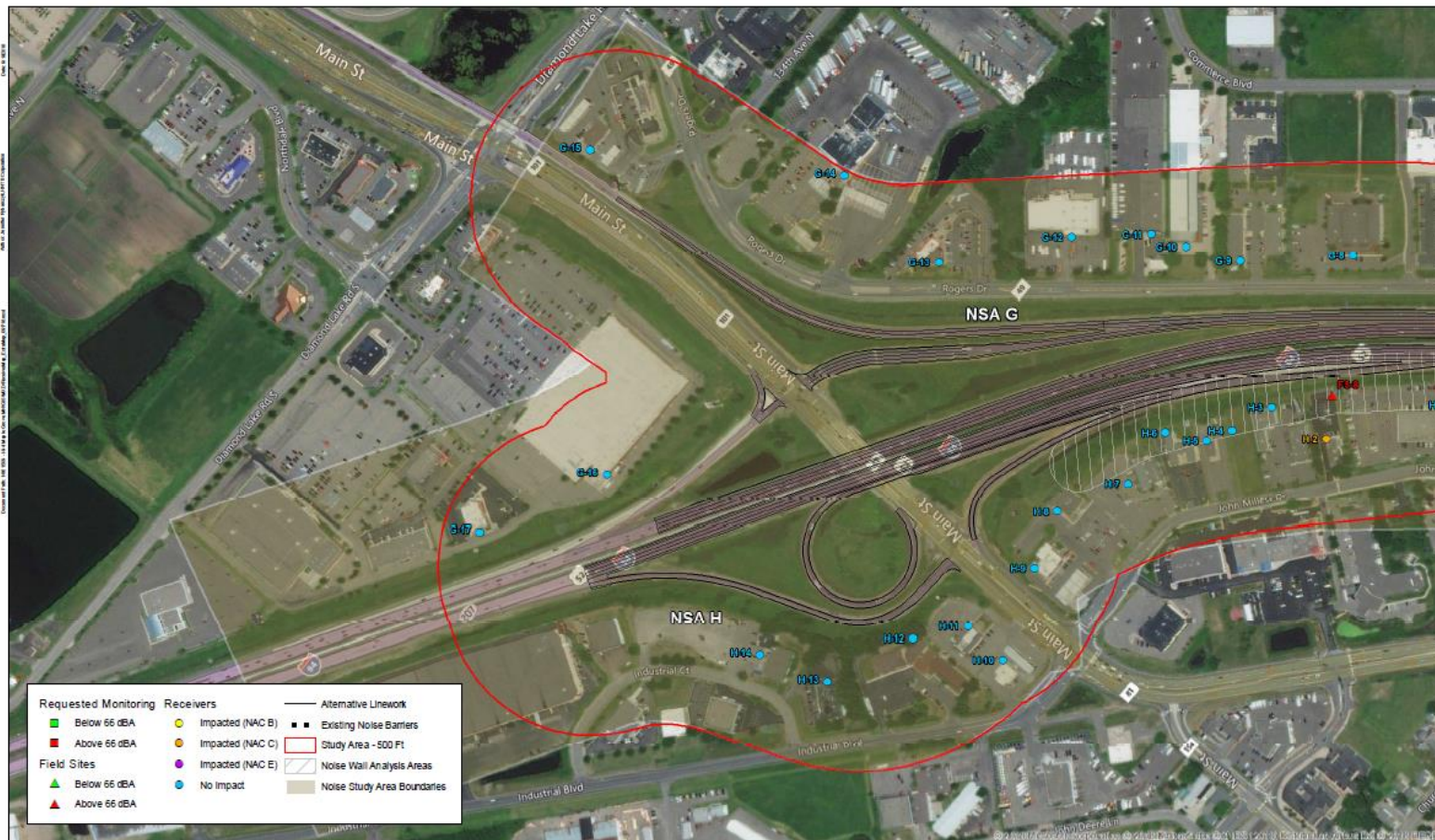


Figure 16 - Traffic Noise Study  
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# Next Steps

- CNE Group Meeting #3 – October 2018
- Noise Barrier Voting – Early 2019 (30 Days)
- Noise Barrier Voting Public Meeting – Early 2019
- Noise Barrier Construction – with project in 2020

# Thank you!