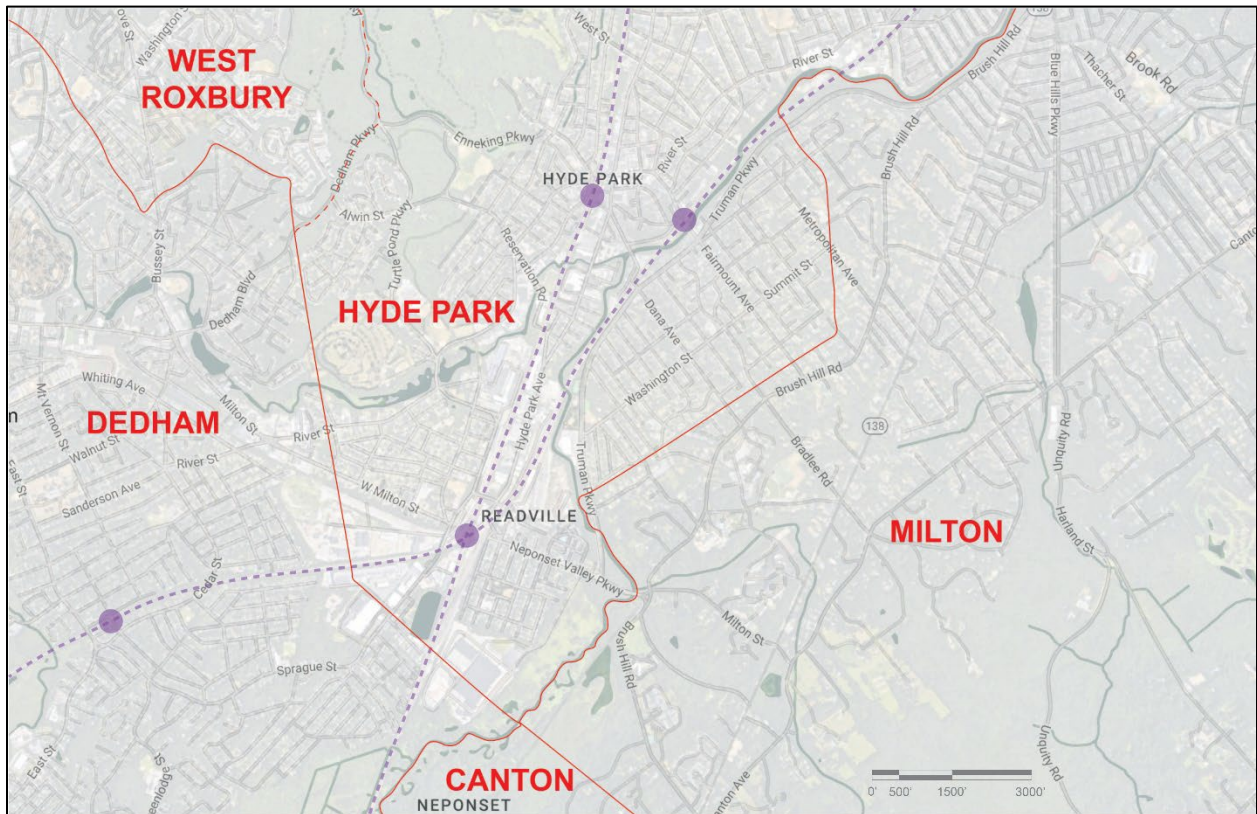


MBTA CONTRACT NO. J19PS01 AM04

COMMUNITY INPUT NOISE STUDY READVILLE & HYDE PARK, BOSTON, MA





COMMUNITY INPUT NOISE STUDY

READVILLE & HYDE PARK, BOSTON, MA

MBTA CONTRACT NO. J19PS01 AM04

PROJECT NO.: 30901237.004
DATE: JULY 2023

WSP USA
13TH FLOOR
100 SUMMER STREET
BOSTON, MA 02110

TEL.: +1 617 426-7330
WSP.COM



TABLE OF CONTENTS

1	METHODOLOGY	1
1.1	Purpose	1
1.2	Initial Public Survey and Study Area	1
1.3	Noise Recorder Locations.....	2
1.4	Noise Instrumentation	5
2	REGULATORY SETTING.....	6
2.1	Noise Regulations	6
2.2	FTA/MBTA Noise Policy	6
2.3	Mass DEP Noise Policy	7
2.4	Boston Noise Code.....	7
3	ANALYSIS.....	8
3.1	Public Complaints	8
3.2	Noise Data Reduction	10
3.2.1	Unbiased Listeners.....	10
3.2.2	Frequency Spectrum Analysis.....	13
3.2.3	Reported Activity within the Area	14
4	FIELD OBSERVATIONS.....	15
4.1	Area 1: 1 Westinghouse Plaza	16
4.2	Area 2: 14 Glenwood Avenue	17
4.3	Area 3: 4 Lawton Street.....	18
4.4	Area 4: 1452 Canton Avenue	19

TABLES

Table 3-1 Noise Complaint Form..... 9

Table 3-2 Summary of Listeners Analysis of Sound Clips.....12

Table 4-1 Site Observations.....16

Table 4-2 Site Observations.....17

Table 4-3 Area 3 Site Observations..... 18

Table 4-4 Area 4 Site Observations.....19

FIGURES

Figure 1-1 MBTA Public Survey Form.....1

Figure 1-2 Locations of Survey Noise Complaints2

Figure 1-3 Noise Recorder Locations3

Figure 1-4 Noise Recorder at Site 13

Figure 1-5 Noise Recorder at Site 2.....4

Figure 1-6 Noise Recorder at Site 34

Figure 1-7 Noise Recorder at Site 4.....4

Figure 1-8 Svantek 971 Noise Recorder5

Figure 2-1 FTA “Project Noise” Criteria..... 6

Figure 2-2 FTA “Cumulative Noise” Criteria..... 6

Figure 3-1 Noise Complaint Form 8

Figure 3-2 Locations of Noise Reports from Community Form10

Figure 3-3 Spectrum of Sound Clip ID 02-3..... 13

Figure 3-4 Spectrum of Sound Clip ID 05-1.....13

Figure 3-5 Spectrum of Sound Clip ID 16-113

Figure 3-6 Spectrum of Sound Clip ID 17-1.....13

Figure 4-1 Locations with Severe Noise Complaints.....15

Figure 4-2 Locations Visited in Area 116

Figure 4-3 Locations Visited in Area 217

Figure 4-4 Locations Visited in Area 3..... 18

Figure 4-5 Locations Visited in Area 4.....19

APPENDICES

A MAPS OF EACH UNIQUE COMPLAINT



1 METHODOLOGY

1.1 PURPOSE

At the request of the MBTA, WSP carried out a community noise study to investigate noise complaints coming from people living in the areas of Readville and Hyde Park, Massachusetts. The MBTA has received noise complaints from neighbors and hopes to identify the cause(s) of the complaints through this study. The source(s) of community noise could be from MBTA commuter train, CSX freight train activities, MBTA layover facility operations, or local noise sources such as industrial or commercial operations, power generation and distribution, local HVAC equipment, or something else. This study is intended to try to identify the sources of the noise that community members may be complaining about.

The MBTA operates within all required Federal and State environmental permitting processes at their facilities and within their train operations. Nevertheless, the MBTA would like to assist the local community with identifying the noise source(s).

1.2 INITIAL PUBLIC SURVEY AND STUDY AREA

After a month-long public survey in September 2022, promoted by the MBTA, Massachusetts State Representative Consalvo, Massachusetts State Representative Driscoll, Massachusetts State Senator Rush, Councilor Arroyo, and associated social media, the MBTA generated a spreadsheet of complaints from the neighborhood surrounding the MBTA Readville Yards. There were no specific geographical limitations to this study. In the end, 148 community members responded to the MBTA’s noise complaint form (shown in **Figure 1-1**) with their names, time and date, address, and nature of their complaints.

The 148 responses were then reduced and sorted to identify the prime locations and nature of the noises identified by the complaints, as shown in **Figure 1-2**. This data reduction led to the selection of four (4) site locations to deploy automated long-term noise recording devices.

Figure 1-1 MBTA Public Survey Form

MBTA Sound Study- Hyde Park, Milton, Readville

As you may know, the MBTA's Capital Investment Plan (CIP) for this year included a \$200,000 sound study for the Hyde Park, Readville, and Milton areas to try to address the ambient noise issue that has been reported by neighbors along the Fairmount Line. As part of that, the MBTA has asked for our help to solicit feedback from the community to incorporate into the study. Please use this form to submit your comments regarding the study. We will collect community feedback for 30 days, ending on October 12th, 2022. Many thanks for your help with this issue.

-State Representative Rob Consalvo, State Representative Bill Driscoll, State Senator Mike Rush, and Councilor Ricardo Arroyo

* Required

1. Name *

Enter your answer

2. Address *

Enter your answer

3. Phone Number *

Enter your answer

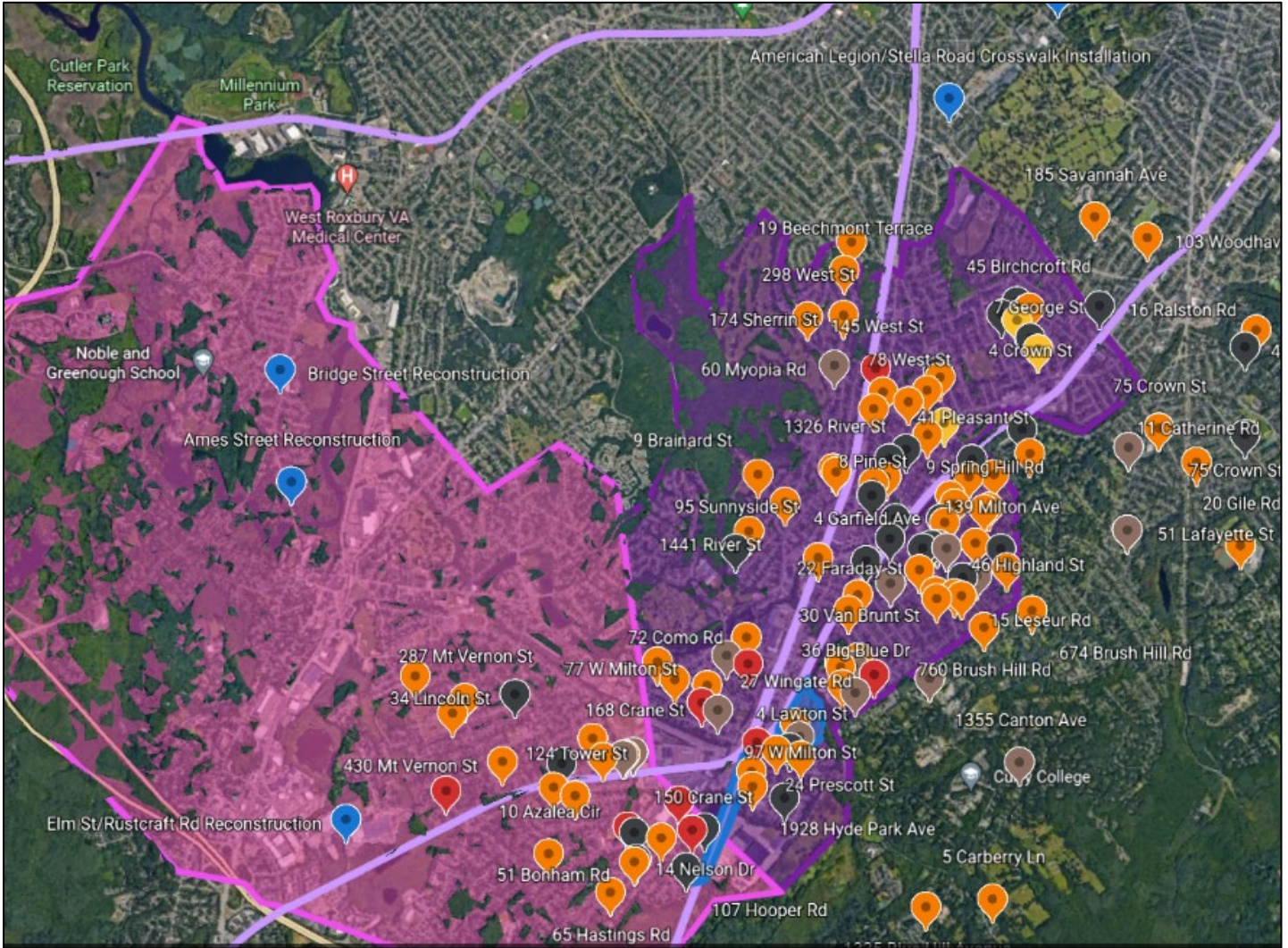
4. Email *

Enter your answer

5. Comments, feedback, and experiences with ambient noise along the Fairmount Commuter Rail Line in Hyde Park, Milton, and Readville *

Enter your answer

Figure 1-2 Locations of Survey Noise Complaints



- ORANGE = LOW TONE/FREQUENCY COMPLAINT
- BROWN = LOW TONE/FREQUENCY COMPLAINT = "TRAIN ENGINE" SPECIFIC COMPLAINT
- RED = HIGH TONE/FREQUENCY COMPLAINT
- YELLOW = NON-SPECIFIED COMPLAINT
- BLACK = NOT ENOUGH DETAIL PROVIDED
- BLUE = ONGOING CONSTRUCTION PROJECTS

1.3 NOISE RECORDER LOCATIONS

The sites for deploying the four noise recorders, as shown in **Figure 1-3**, were selected based on the density of initial noise complaints obtained during the public survey in September 2022. The four monitoring sites included:

- Site 1. Existing MBTA Readville Layover Yard 2, near 4 Wolcott Court (see **Figure 1-4**)
- Site 2. Existing MBTA Readville Layover Yard 1, near the end of Prescott Street (see **Figure 1-5**)
- Site 3. Private Residence at 114 Readville Street (see **Figure 1-6**)
- Site 4. Private Residence at 46 Highland Street (see **Figure 1-7**)

Figure 1-3 Noise Recorder Locations

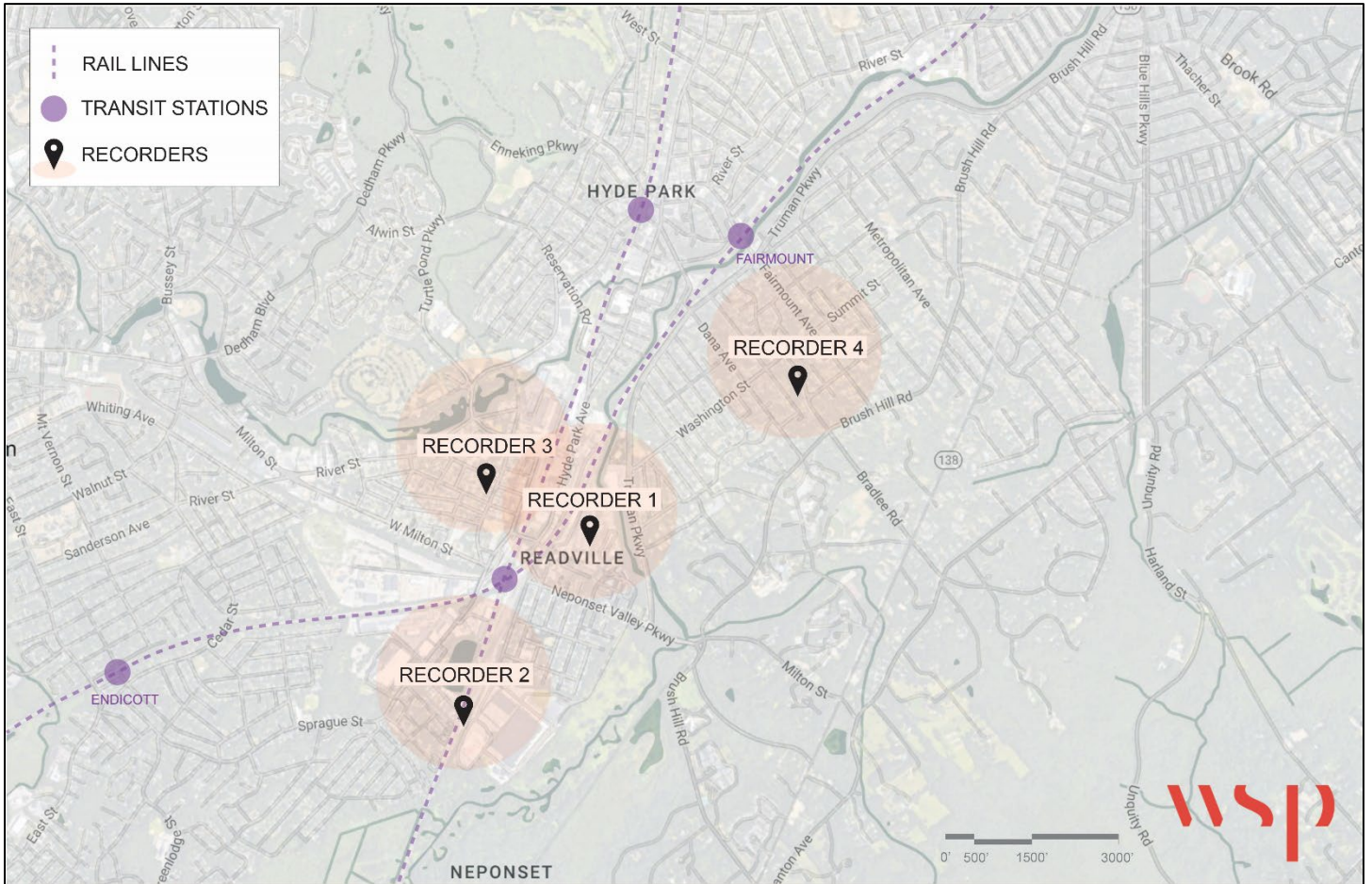


Figure 1-4 Noise Recorder at Site 1



Site 1 was located on MBTA property in Yard 2 behind the Transportation Building along Walcott Street. In addition to recording the noises that residents in the area might be hearing, it also served as a control monitor to indicate when MBTA trains were idling. When the recorder was placed, the area was observed to be fairly noisy from MBTA activities, local industrial activities, and passing trucks/vehicles on Walcott Street.

Figure 1-5 Noise Recorder at Site 2



Site 2 was located on MBTA property in Yard 1 near the end of Prescott Street. While there are some industrial and commercial land-uses in the area, Prescott Street is a residential neighborhood. Lancaster Road and McDonald Street and associated residential neighborhoods are also located in this area except on the opposite side of the tracks.

Figure 1-6 Noise Recorder at Site 3



Site 3 was located in the backyard of a private residence at 114 Readville Street. This residential neighborhood is located on the opposite side of the tracks from MBTA Yard 2.

Figure 1-7 Noise Recorder at Site 4



Site 4 was located on the back porch of a private residence at 46 Highland Street. This area is dense suburban residential land-use including roadways such as Fairmont Avenue, Summit Street, and Beacon Street.

1.4 NOISE INSTRUMENTATION

As shown in **Figure 1-8**, Svantek Model SV-971 noise monitors, which comply with ANSI Standard S1.4 for Type 1 accuracy, were used throughout this study. The noise monitors were calibrated beforehand with a Bruel & Kjaer Model 4231 acoustical calibrator. As shown in **Figures 1-4 thru 1-7**, the SV-971 instruments were deployed in weatherproof cases with large batteries, and their microphones were remotely attached on tripods. Unfortunately, this arrangement makes the microphones somewhat susceptible to water damage from rain; which did adversely affect two of the four monitors (Site 1 and Site 4) for a few days until the microphone could be replaced. The monitors at Site 2 and Site 3 operated without issue throughout the month. Thus, there were no occasions when noise levels were not being monitored by at least one instrument.

For this study, measuring the sound level in decibels (dBA) was not important (nor the goal) because there are no regulatory restrictions to judge the sound levels against. Instead, the four noise monitors were used as digital tape recorders to record audio wave files (*.wav) continuously throughout the month-long monitoring period.

After the wave files were downloaded and processed using Svantek's SvanPC++ software, the wave files were listened to at and around the time/date corresponding to all the noise complaints received during the monitoring period in May 2023 (described below). Listening to the wave files was the goal of this study to hopefully identify the nature of the noise(s).

Figure 1-8 Svantek 971 Noise Recorder



2 REGULATORY SETTING

2.1 NOISE REGULATIONS

Depending on what the source(s) of the noise(s) may be, there are several potentially relevant noise regulations or ordinances that may apply. The MBTA is exempt from Mass DEP noise regulations and from the City of Boston Noise Code. All MBTA train movements and layover operations have already been approved through acoustical studies required in accordance with the National Environmental Protection Act (NEPA) which require Environmental Impact Studies performed with the community noise policies promulgated by the Federal Transit Administration (FTA).

2.2 FTA/MBTA NOISE POLICY

The Federal Transit Administration’s (FTA) and MBTA’s community noise policies are contained in *FTA’s Transit Noise and Vibration Impact Assessment Manual (Sept 2018)*. FTA’s noise criteria are based on sensitive land-use categories and relative changes in noise exposure caused by a project. FTA noise criteria compare future project noise with a receptor’s existing noise exposure. FTA noise criteria limits incorporate both absolute criteria, which consider activity interference caused by the rail project alone, and relative increase criteria which consider annoyance due to the change in the noise environment caused by the project. Although the impact criteria allow higher levels of project noise in areas with high levels of existing noise, smaller relative increases in total noise exposure are allowed in such areas. Again, these FTA/MBTA community noise studies are only required for new or expanding projects.

FTA’s noise criteria define two threshold levels of impact, “moderate” impact and “severe” impact, based on a receptor’s existing noise exposure and land-use category. The interpretation of these two levels of noise impact severity is summarized below:

- Severe Impact: Project-generated noise in the severe impact range can be expected to cause a significant percentage of people to be highly annoyed by the new noise and represents the most compelling need for mitigation.
- Moderate Impact: In this range of noise impact, the change in the cumulative noise level is noticeable to most people but may not be sufficient to cause strong, adverse reactions from the community. In this transitional area, other project-specific factors must be considered to determine the magnitude of the impact and the need for mitigation. These factors include the existing noise level, the predicted level of increase over existing noise levels, the types and numbers of noise-sensitive land-uses affected, the noise sensitivity of the properties, community views, and the cost of mitigating noise to more acceptable levels.

There are two approaches for identifying noise impact in the FTA manual; the “project noise” approach and the “cumulative noise” approach, as shown in **Figures 2-1 and 2-2**, respectively. The two approaches are derived from each other and will yield the same results, however the description of the project and its operational effects dictate which approach is best to use.

Figure 2-1 FTA “Project Noise” Criteria

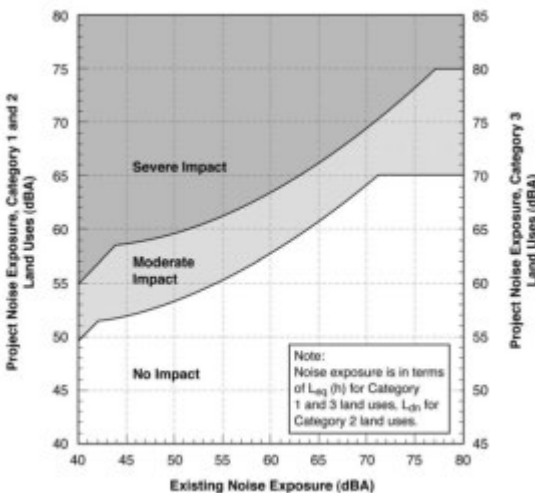
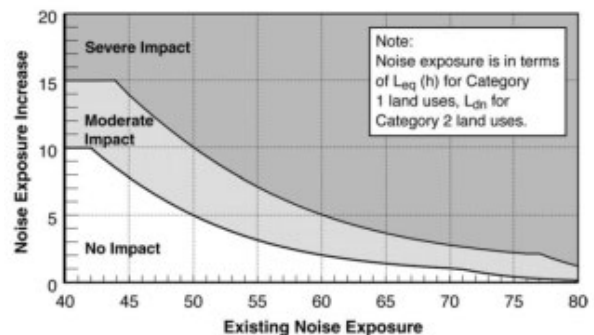


Figure 2-2 FTA “Cumulative Noise” Criteria





Noise impact criteria are also dependent on the land-use category of the receptor. Category 1 land-use includes tracts of land where quiet is an essential element in their intended purpose, such as outdoor concert pavilions, recording studios, concert halls, and historical sites with significant outdoor land-use. Category 2 land-use includes residences and buildings where people normally sleep. This category includes homes, hospitals, and hotels where nighttime sensitivity to noise is assumed to be of utmost importance. Category 3 land uses include institutional properties with primarily daytime and evening use, such as medical offices, churches, schools, libraries, and theaters. Places with meditation or study associated with cemeteries, museums, monuments, and recreational facilities are also included in this category. Most general purpose businesses and commercial buildings are not included in any category.

The relevant noise metric when evaluating Category 2 receptors is the Ldn due to the receptor's sensitivity to nighttime noise intrusion. The Ldn metric is a 24-hour acoustical energy average sound level in which a penalty of 10 decibels is applied at night from 10 PM to 7 AM due to people's greater sensitivity to noise intrusion at night. Category 1 and 3 receptors are analyzed using the Leq for the loudest hour of transit-related activity produced during hours of noise sensitivity. The Leq metric is the acoustical energy average over a given time period. All noise levels measured or predicted using the FTA procedure are expressed in A-weighted decibels (dBA) and are evaluated on the exterior of the receptor at a position closest to or facing the project.

2.3 MASS DEP NOISE POLICY

The noise criteria promulgated by the Massachusetts Department of Environmental Protection (Mass DEP) in their Policy 90-001 is based on air pollution regulations found in 310 CMR 7.10 that define acceptable noise emission conditions for new stationary sources. Transportation sources, such as trains and roadways, are exempt from needing to adhere to Mass DEP's noise limits. Mass DEP's noise policy criteria states that broadband A-weighted noise levels (dBA), with the new equipment operating, should not exceed ambient noise conditions by more than 10 dBA. Mass DEP defines ambient noise as the prevailing background noise that exists 90% of the time (L90) in the absence of the new equipment. Mass DEP noise policy criteria also attempt to avoid the creation of annoying pure tone conditions which are defined as occurring when the noise level in any single octave band exceeds the levels in the adjacent octave bands by more than 3 decibels. These noise policy criteria are typically evaluated at the property lines of the receiver as well as at the facades of surrounding inhabited buildings. In general, the MBTA is exempt from Mass DEP noise regulations.

2.4 BOSTON NOISE CODE

Both Readville and Hyde Park are considered part of the City of Boston. Boston's Noise Code, enacted under The Air Pollution Control Commission of the City of Boston, acting under the authority granted in Chapter 40, Section 21 of Boston Code, Ordinances, Title 7, Section 50, limits noise to not exceed 60 dBA during the daytime (7 AM to 6 PM) or 50 dBA during the nighttime (6 PM to 7 AM) at residential property lines. There are also octave band noise limitations in order to avoid the generation of potentially annoying pure tones. However, transportation noise sources, such as trains, are typically exempt from these noise restrictions.

3 ANALYSIS

3.1 PUBLIC COMPLAINTS

The MBTA developed a website for community members to register noise complaints during the month-long noise recordings performed in May 2023, as shown in **Figure 3-1**. The form directed people to indicate their names, addresses, time/date of complaint, the duration and description of the noise, and an option to provide applicable photos/videos. This was a critical step in the noise study to aid investigators towards identifying the noise source if possible.

The public complaint log produced 57 responses and 23 unique complaints at 17 different locations, as listed in **Table 3-1** and shown in **Figure 3-2**. Each complaint was assigned an ID number for tracking purposes. The times and dates of the complaints were then matched up with the nearest noise recorder’s wave files to zero into the moment cited in the complaints. A smaller wave file clip was then produced covering a few minutes before and after the complaint, resulting in 39 sound clips. These sound clips were then shared with several unbiased listeners, both laypeople and experienced acoustical staff, to listen to and hopefully identify the source of the noise source(s) they were hearing. Refer to **Appendix A** for individual maps for each of the 23 unique complaints.

Figure 3-1 Noise Complaint Form

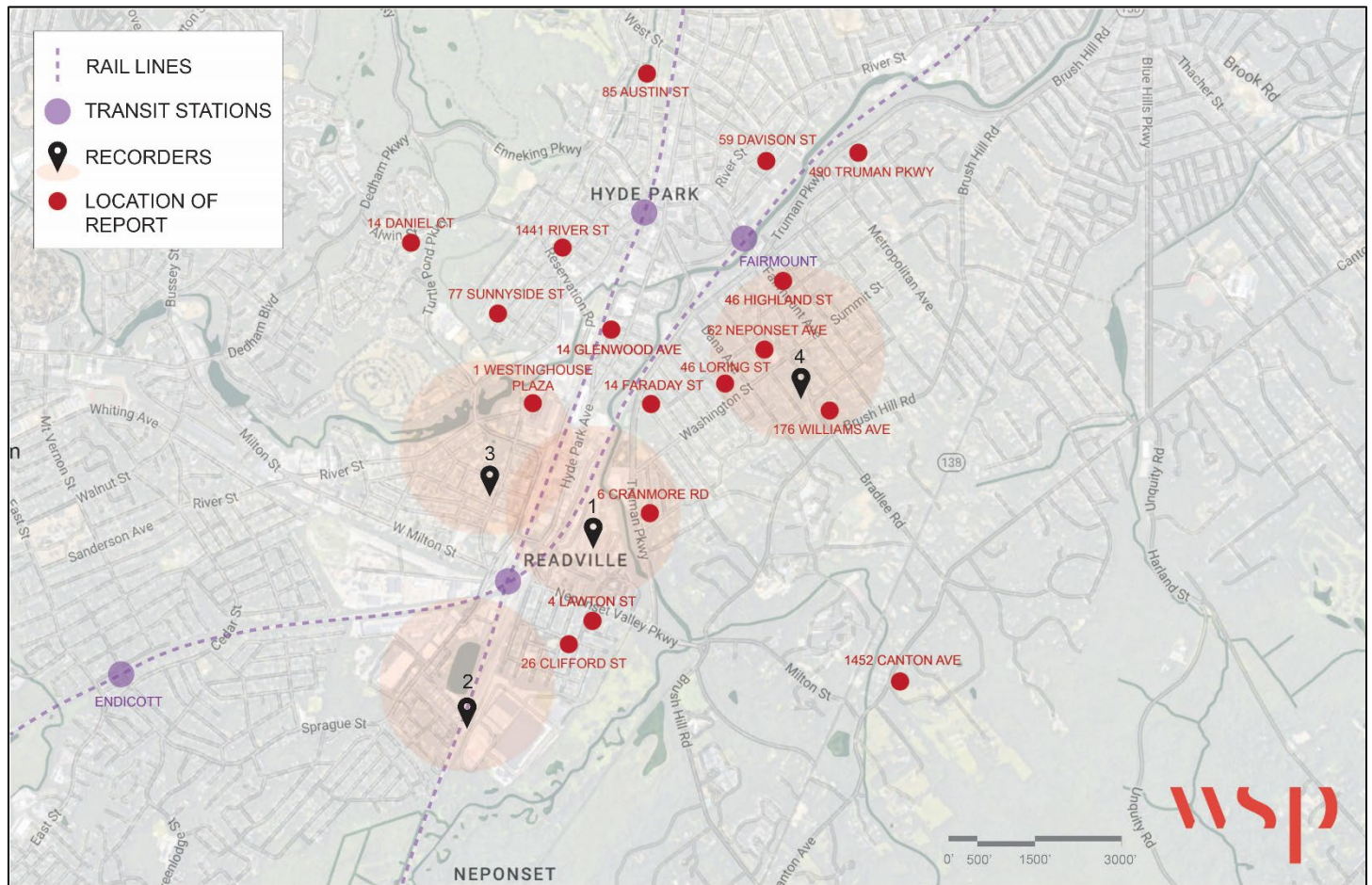


Table 3-1 Noise Complaint Form

ID NUMBER	DATE	TIME FRAME	NOISE DESCRIPTION	TIME OF COMPLAINT	ADDRESS
1	4-May	2 AM - 6 AM	Low Hum, Vibrating	6:00 AM	1452 Canton Ave
1	4-May	2 AM - 6 AM	Low Hum, Vibrating	4:00 AM	6 Cranmore Rd
1	4-May	2 AM - 6 AM	Low Hum, Vibrating	3:45 AM	4 Lawton St
1	4-May	2 AM - 6 AM	Low Hum, Vibrating	2:00 AM	490 Truman Pkwy
2	12-May	12 AM - 8 AM	Low Hum, Vibrating, Horns	12:00 AM	176 Williams Ave
2	12-May	12 AM - 8 AM	Low Hum, Vibrating, Horns	1:15 AM	14 Glenwood Ave
3	15-May	~ 3:00 AM	Low Hum, Vibrating	3:32 AM	4 Lawton St
3	15-May	~ 3:00 AM	Low Hum, Vibrating	2:55 AM	16 Cranmore Rd
4	16-May	12 AM - 2 AM	Vibrating, Whistles, Starting and Braking	12:54 AM	14 Glenwood Ave
4	16-May	12 AM - 2 AM	Vibrating, Whistles, Starting and Braking	12:00 AM	46 Highland St
5	1-May	9 PM - 5:30 AM	Vibrating	9:00 PM	26 Clifford St
5	1-May	9 PM - 5:30 AM	Vibrating	9:00 PM	1441 River St
5	1-May	9 PM - 5:30 AM	Vibrating	3:00 AM	46 Highland St
6	6-May	~ 2:00 AM	Low hum, Train Idle	2:49 AM	14 Glenwood Ave
6	6-May	~ 2:00 AM	Low hum, Train Idle	2:54 AM	4 Lawton St
6	6-May	~ 2:00 AM	Low hum, Train Idle	2:00 AM	59 Davidson St
6	6-May	~ 2:00 AM	Low hum, Train Idle	-	85 Austin St
7	9-May	1:30 AM - 6 AM	Low hum, Vibrating	1:38 AM	4 Lawton St
7	9-May	1:30 AM - 6 AM	Low hum, Vibrating	2:00 AM	14 Glenwood Ave
8	11-May	12 AM - 4 AM	Low hum, Train Idle	2:11 AM	14 Glenwood Ave
8	11-May	12 AM - 4 AM	Low hum, Train Idle	4:23 AM	4 Lawton St
9	18-May	10:30 AM	Low hum, Vibrating	10:30 AM	4 Lawton St
10	7-May	9:43 PM	Train Idle, Vibrating	9:43 PM	14 Glenwood Ave
11	Every Day	All Passings	Loud Train Passing	-	1 Westinghouse Plaza
12	17-May	8 AM - 7 PM	Low Hum, Vibrating	7:00 PM	46 Highland St
13	18-May	~ 1:00 AM	Train Idle, Vibrating	1:03 AM	4 Lawton St
13	18-May	~ 1:00 AM	Train Idle, Vibrating	1:05 AM	62 Neponset Ave
14	19-May	12 AM - 1 AM	Train Idle, Low Hum, Vibrating, Horns	1:00 AM	14 Glenwood Ave
14	19-May	12 AM - 1 AM	Train Idle, Low Hum, Vibrating, Horns	12:00 AM	14 Daniel Ct
15	20-May	12 AM - 6 AM	Low Hum, Vibrating	12:00 AM	46 Highland St
16	22-May	8:00 PM	Vibrating	8:00 PM	77 Sunnyside St
17	25-May	3:00 PM	Train Idle	3:00 PM	14 Faraday St
18	25-May	7:00 PM	Train Idle	7:00 PM	14 Faraday St
19	27-May	1 AM - 6 AM	Train Idle, Low Hum, Vibrating	1:54 AM	14 Glenwood Ave

ID NUMBER	DATE	TIME FRAME	NOISE DESCRIPTION	TIME OF COMPLAINT	ADDRESS
19	27-May	1 AM - 6 AM	Train Idle, Low Hum, Vibrating	6:00 AM	1452 Canton Ave
20	28-May	1 AM - 6 AM	Train Idle, Low Hum, Vibrating	1:17 AM	14 Glenwood Ave
20	28-May	1 AM - 6 AM	Train Idle, Low Hum, Vibrating	6:00 AM	1452 Canton Ave
21	29-May	1:36 AM	Train Idle, Vibrating, Horns	1:36 AM	14 Glenwood Ave
22	30-May	1:10 AM	Train Idle, Low Hum	1:10 AM	4 Lawton St
23	31-May	12:18 AM	Train Idle, Horns	12:18 AM	14 Glenwood Ave

Figure 3-2 Locations of Noise Reports from Community Form



3.2 NOISE DATA REDUCTION

3.2.1 UNBIASED LISTENERS

The 39 smaller wave file sound clips of the received complaints during the sound collection period, were shared with six people (listeners) so that they could *hear for themselves* the noise(s) that people might have been complaining about. It was hoped that the



listeners might be able to identify the source of the noise(s) based on their everyday life experiences and familiarity with the area in question.

Three of the listeners were trained professional acoustical engineers who have performed many outdoor noise monitoring projects in the past including projects at night. The other three listeners were laypeople intentionally selected to seek their unbiased reactions. All of the listeners then completed a log sheet to provide feedback and comments on each sound clip to aid in identifying the noise(s). Those responses were then summarized into common reactions and are shown in **Table 3-2**.



Table 3-2 Summary of Listeners Analysis of Sound Clips

REPORT ID NUMBER	RECORDING TITLE	RECORDER	DATE	TIME	SOUND DESCRIPTION	DOMINANT FREQUENCY LEVELS	POSSIBLE SOURCES
1	ID 01-1	3	5/4/2023	1:47 AM	Low Frequency Oscillating Hum	89 / 58 Hz	Distant Idling Locomotive
2	ID 02-1	1	5/12/2023	12:32 AM	Low Frequency Oscillating Hum, Horns, Bells	85 Hz	Idling Locomotive, Train Horn and Bells
2	ID 02-2	1	5/12/2023	2:01 AM	Low Frequency Oscillating Hum	85 Hz	Idling Locomotive, Truck Movement
2	ID 02-3	1	5/12/2023	2:21 AM	Low Frequency Oscillating Hum	85 Hz	Idling Locomotive
3	ID 03-1	1	5/15/2023	3:45 AM	Low Frequency Oscillating Hum	58 / 64 Hz	Distant Idling Locomotive
4	ID 04-1	1	5/16/2023	12:46 AM	Low Frequency Oscillating Hum, Horns, Bells	90 / 43 Hz	Idling Locomotive, Train Movement, Train Horns and Bells
4	ID 04-2	1	5/16/2023	2:24 AM	Low Frequency Oscillating Hum, Brakes	89 / 176 / 43 Hz	Idling Locomotive, Train Movement, Train Braking
5	ID 05-1	1	5/1/2023	9:52 PM	Low Frequency Steady Hum, Brakes	91 Hz	Distant Idling Locomotive or Fan, Train Braking
5	ID 05-2	1	5/2/2023	2:01 AM	Low Frequency Oscillating Hum, Brakes	58 / 73 / 90 Hz	Idling Locomotive, Train Braking
6	ID 06-1	3	5/6/2023	2:08 AM	Low Frequency Increasing Hum	90 / 58 Hz	Idling Locomotive, Train Movement
6	ID 06-2	3	5/6/2023	2:56 AM	Low Frequency Increasing Hum	90 Hz	Distant Idling Locomotive or Distant Train Movement
7	ID 07-1	3	5/9/2023	2:10 AM	Low Frequency Steady Hum	85 / 58 / 42 Hz	Distant Idling Locomotive
7	ID 07-2	3	5/9/2023	5:07 AM	Low Frequency Steady Hum	42 / 77 / 86 Hz	Distant Idling Locomotive, Helicopter Overflight
8	ID 08-1	1	5/11/2023	2:05 AM	Low Frequency Oscillating Hum	42 / 58 Hz	Distant Idling Locomotive
8	ID 08-2	1	5/11/2023	2:27 AM	Low Frequency Oscillating Hum	58 / 55 Hz	Distant Idling Locomotive, Truck Movement
8	ID 08-3	1	5/11/2023	3:07 AM	Low Frequency Steady Hum, Brakes	90 / 59 / 73 / 181 Hz	Idling Locomotive or Fan, Train Braking
9	ID 09-1	3	5/18/2023	10:23 AM	Increasing and Decreasing Low Hum	90 / 40 Hz	Jet Overflight, Truck Movement
10	ID 10-1	3	5/7/2023	9:43 PM	Low Frequency Oscillating Hum	90 / 59 Hz	Distant Idling Locomotive, Jet Overflight, Truck Movement
11	ID 11-1	3	5/12/2023	9:09 AM	Brief Humming, Horns	620 / 460 Hz	Jet Overflight, Train Horn
12	ID 12-1	4	5/17/2023	8:31 AM	No Unusual Noise	658 / 631 Hz	Truck Movement
12	ID 12-2	4	5/17/2023	1:23 PM	No Unusual Noise	93 Hz	Circular Handsaw, Truck Movement
12	ID 12-3	4	5/17/2023	6:15 PM	No Unusual Noise	590 Hz	Distant Helicopter
13	ID 13-1	2	5/18/2023	1:11 AM	Low Frequency Steady Hum	47 / 69 Hz	Idling Locomotive
14	ID 14-1	3	5/19/2023	12:16 AM	Low Freq. Increasing / Decreasing Hum, Brakes, Horns, Bells	613 / 43 / 28 Hz	Train Movement, Train Horns and Bells
15	ID 15-1	4	5/20/2023	1:04 AM	Low Frequency Oscillating Hum Increasing / Decreasing	90 Hz	Distant Train Movement
15	ID 15-2	4	5/20/2023	3:13 AM	Low Frequency Oscillating Hum Increasing / Decreasing	90 / 59 / 73 Hz	Distant Train Movement
15	ID 15-3	4	5/20/2023	5:31 AM	Low Frequency Oscillating Hum Increasing / Decreasing	90 / 73 / 59 Hz	Distant Train Movement
16	ID 16-1	1	5/22/2023	7:54 PM	Steady Hum	240 / 841 Hz	Ventilation Fan or Air Conditioner
17	ID 17-1	1	5/25/2023	2:58 PM	Low Frequency Steady Hum, Beeping	58 Hz	Idling Locomotive, Back-Up Alarm
18	ID 18-1	1	5/25/2023	7:02 PM	Low Frequency Steady Hum, Beeping	240 / 840 / 471 Hz	Idling Loco., Back-Up Alarm, Ventilation Fan or Air Conditioner
19	ID 19-1	3	5/27/2023	1:23 AM	Low Frequency Steady Hum	58 / 90 / 42 / 120 Hz	Distant Idling Locomotive
19	ID 19-2	3	5/27/2023	3:34 AM	Low Frequency Steady Hum	58 / 90 / 67 Hz	Distant Idling Locomotive
19	ID 19-3	3	5/27/2023	5:53 AM	Low Frequency Steady Hum	58 / 73 Hz	Distant Idling Locomotive
20	ID 20-1	3	5/28/2023	1:17 AM	Low Frequency Oscillating Hum	58 / 43 Hz	Distant Idling Locomotive, Truck Movement
20	ID 20-2	3	5/28/2023	3:36 AM	Low Frequency Steady Hum	58 / 90 / 120 / 73 Hz	Distant Idling Locomotive, Jet Overflight
20	ID 20-3	3	5/28/2023	6:03 AM	Low Frequency Steady Hum, Bells	120 / 59 / 90 / 240 Hz	Distant Idling Locomotive, Train Bells, Truck Movement
21	ID 21-1	1	5/29/2023	1:34 AM	Low Frequency Steady Hum, Brakes, Horns	90 / 59 / 43 Hz	Idling Locomotive, Train Braking, Train Horn
22	ID 22-1	1	5/30/2023	1:10 AM	Low Frequency Steady Hum, Brakes	58 / 90 / 43 Hz	Idling Locomotive, Train Braking
23	ID 23-1	1	5/31/2023	12:18 AM	Low Frequency Steady Hum	90 Hz	Idling Locomotive

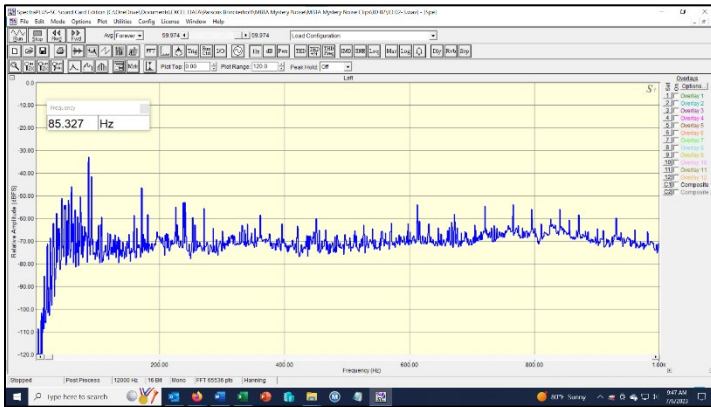
3.2.2 FREQUENCY SPECTRUM ANALYSIS

In addition to listening to all the sound clips, the 39 wave files were processed through a frequency spectrum analysis software package called SpectraPLUS. The goal was to identify the dominant frequencies that people might be hearing. Moreover, it was hoped that the frequency spectra (or sound signatures) could be associated with the likely types of noise source(s) that produced it. This is doable because while sound levels diminish over distance, frequency content does not change. Examples of the frequency spectra are shown in **Figures 3-3 thru 3-6** for four very different sounding sound clips.

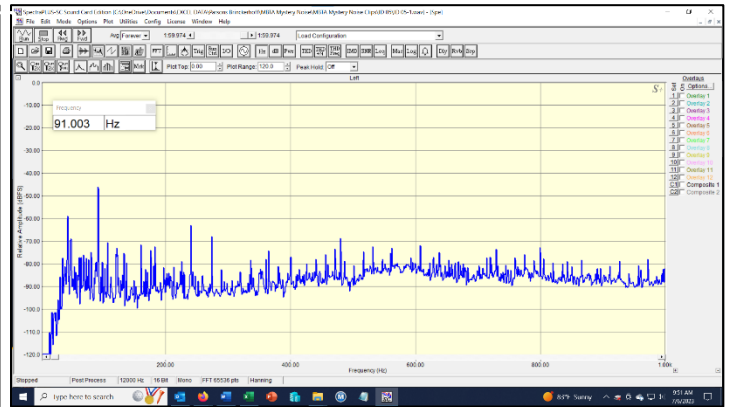
It is also important to note that low frequency can travel vast distances with minimal attenuation, where mid to higher frequencies are easily blocked by terrain, foliage, structures, and air absorption. Moreover, humans react poorly to obtrusive low frequency sound.

Note that locomotives, power plants, and some industrial processes can produce the types of low frequencies observed in the spectral results. Roadway traffic, aircraft overflights, and HVAC systems cannot.

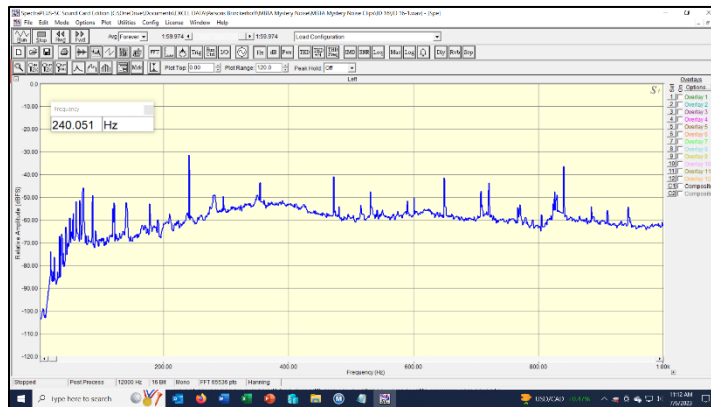
**Figure 3-3 Spectrum of Sound Clip ID 02-3
Loudest at 85 Hz - Suspected of Being an
Idling Train Locomotive**



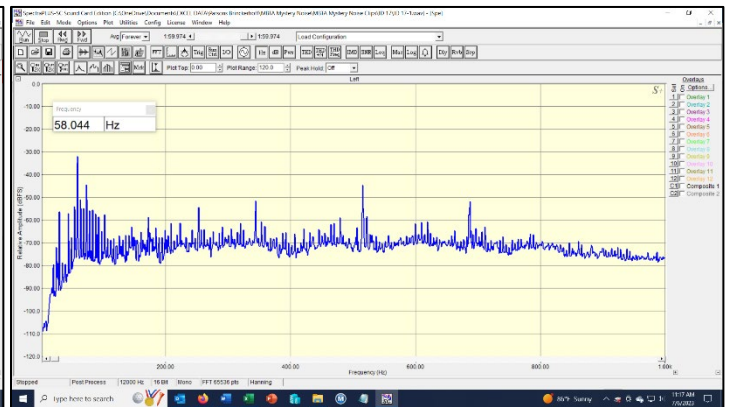
**Figure 3-4 Spectrum of Sound Clip ID 05-1
Loudest at 91 Hz - Suspected of Being a
Distant Idling Train Locomotive or a Fan**



**Figure 3-5 Spectrum of Sound Clip ID 16-1
Loudest at 240 Hz - Suspected of Being a
Ventilation Fan or AC Unit**



**Figure 3-6 Spectrum of Sound Clip ID 17-1Fg
Loudest at 58 Hz - Suspected of Being an
Idling Train Locomotive**





3.2.3 REPORTED ACTIVITY WITHIN THE AREA

As a large number of complaints in the initial public survey specifically called out train movement being a noise source, the Study Team monitored train revenue service schedules and attempted to collect layover yard active hours. Revenue service for the MBTA Commuter Rail Lines (Fairmount, Franklin/Foxborough, and Providence/Stoughton) and Amtrak Acela and Northeast Corridor Service typically occurs between 4:45 AM and 11:45 PM in the study area.

The MBTA Commuter Rail layover yard and repair shop within the study area at Readville Yard 2 typically performs start-up operations between 2:00 and 3:00 AM and trains begin leaving the layover yard after 3:00 AM to travel to their initial destination to begin revenue service. The Study Team was unable to get a schedule for the CSX freight layover yard at Readville Yard 1, but it's expected that operations occur between 3:00 AM and 9:00 PM.

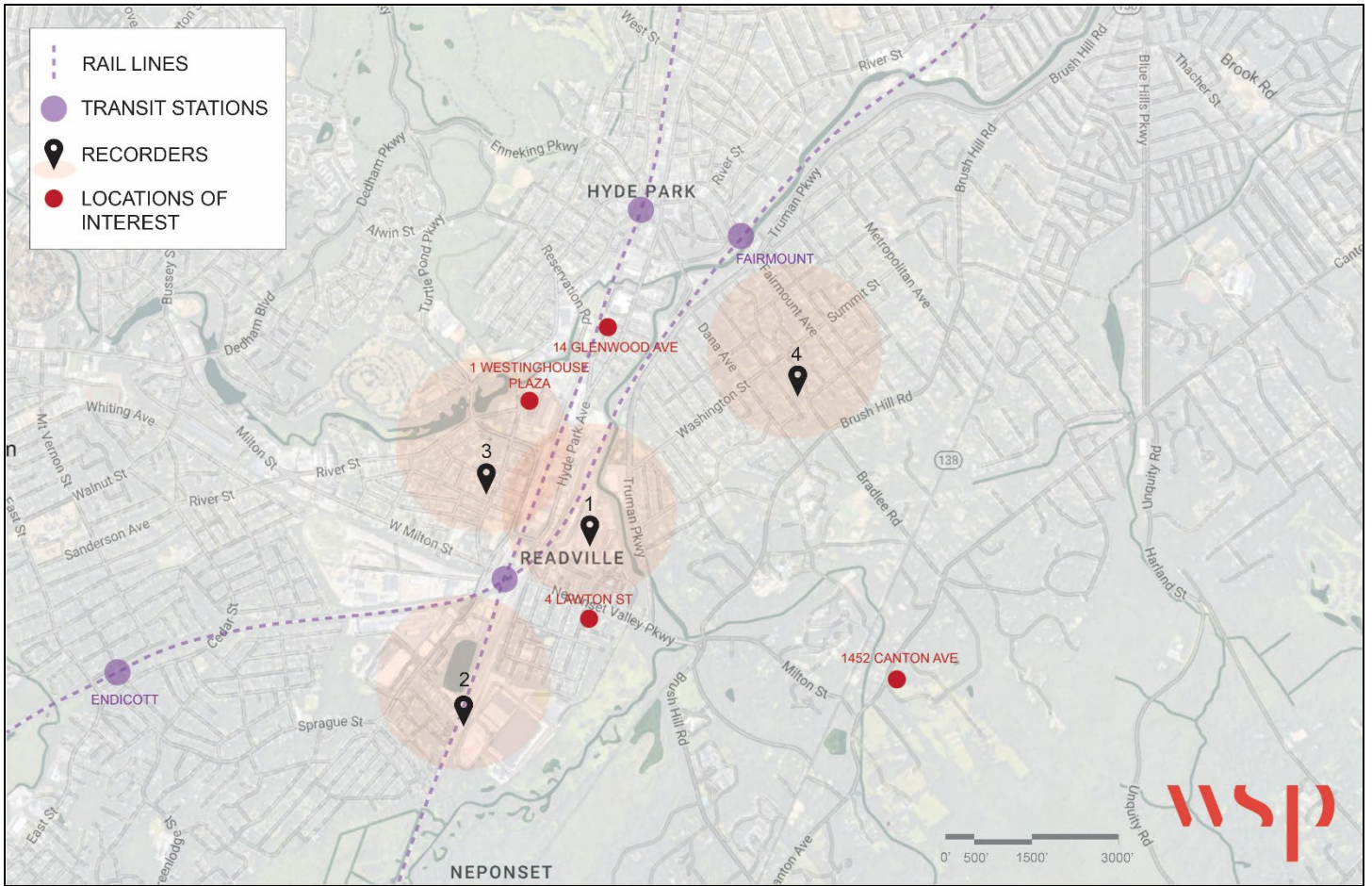
The Study Team also was unable to retrieve dispatcher's logs for unscheduled moves between the MBTA, Amtrak, and CSX within the area. Unscheduled moves are movements not tied to revenue service that can be made for multiple reasons, including transporting a train with a mechanical issue and transporting a train to a layover yard for storage.



4 FIELD OBSERVATIONS

After reviewing the month-long sound clips along with the community input form, the Study Team determined that many reports were found to have come from four distinct addresses: 1 Westinghouse Plaza, 14 Glenwood Avenue, 4 Lawton Street, and 1452 Canton Ave (**Figure 4-1**). The bulk of the reports were concentrated from 12 AM – 6 AM. Out of due diligence, a site visit was performed on July 20th / July 21st from the hours of 11:40 PM – 2:15 AM to observe sounds in the four areas shown below.

Figure 4-1 Locations with Severe Noise Complaints



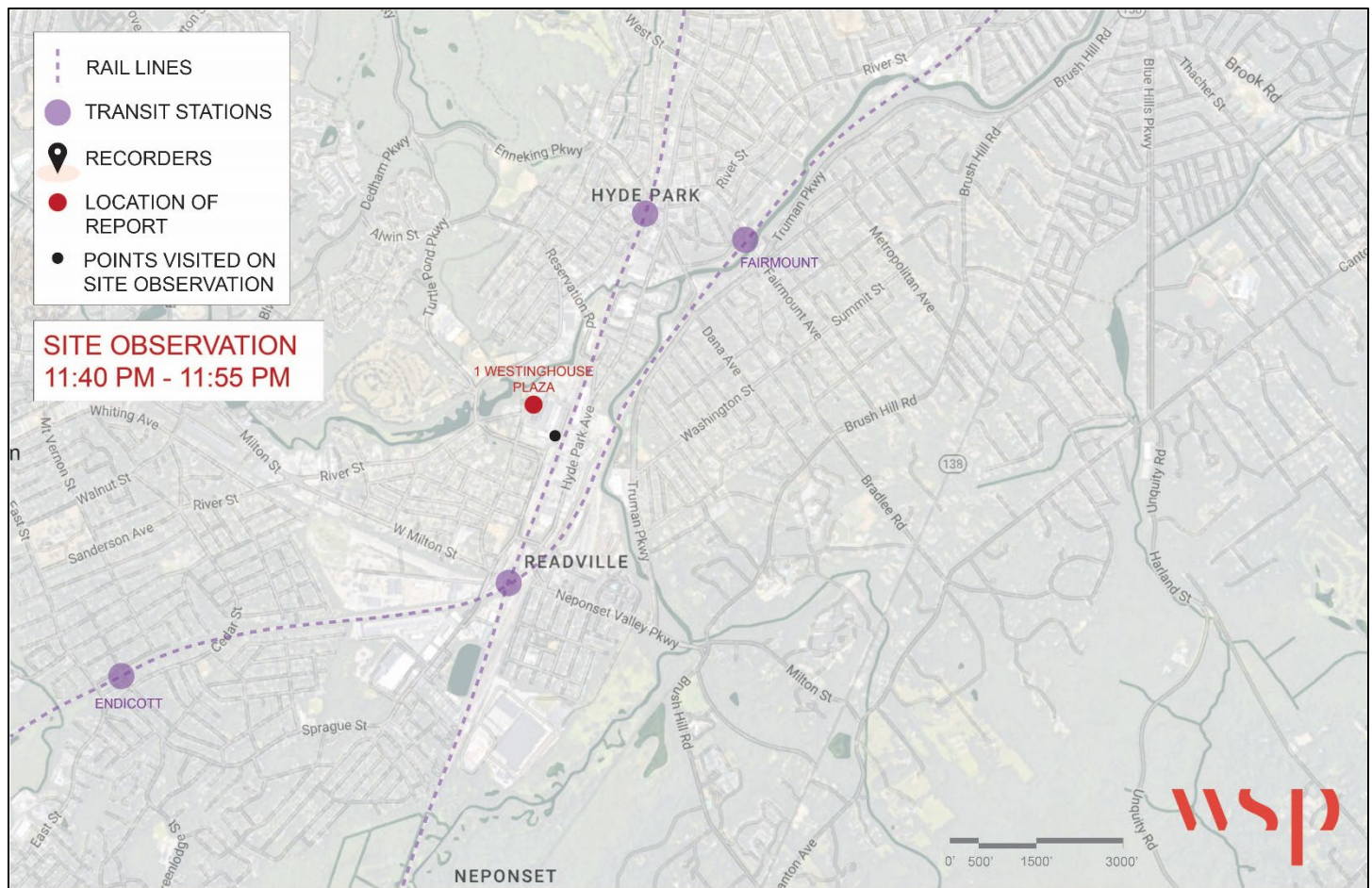
4.1 AREA 1: 1 WESTINGHOUSE PLAZA

The location of 1 Westinghouse Plaza received multiple reports of loud train passings through the community input form. To investigate these complaints, the Study Team visited the site from 11:40 PM – 11:55 PM on July 20th. Throughout the observation, the team witnessed a train pass on the tracks adjacent to the plaza at 11:50 PM. A couple minutes prior to the train passing, crossing bells had also gone off. Other than typical train movement, the area was not observed to have any unusual noise.

Table 4-1 Site Observations

DATE	TIME	LOCATION	OBSERVATION
7/20/2023	11:47 PM	1 Westinghouse Plaza	Train Bells
7/20/2023	11:50 PM	1 Westinghouse Plaza	Train Passing

Figure 4-2 Locations Visited in Area 1



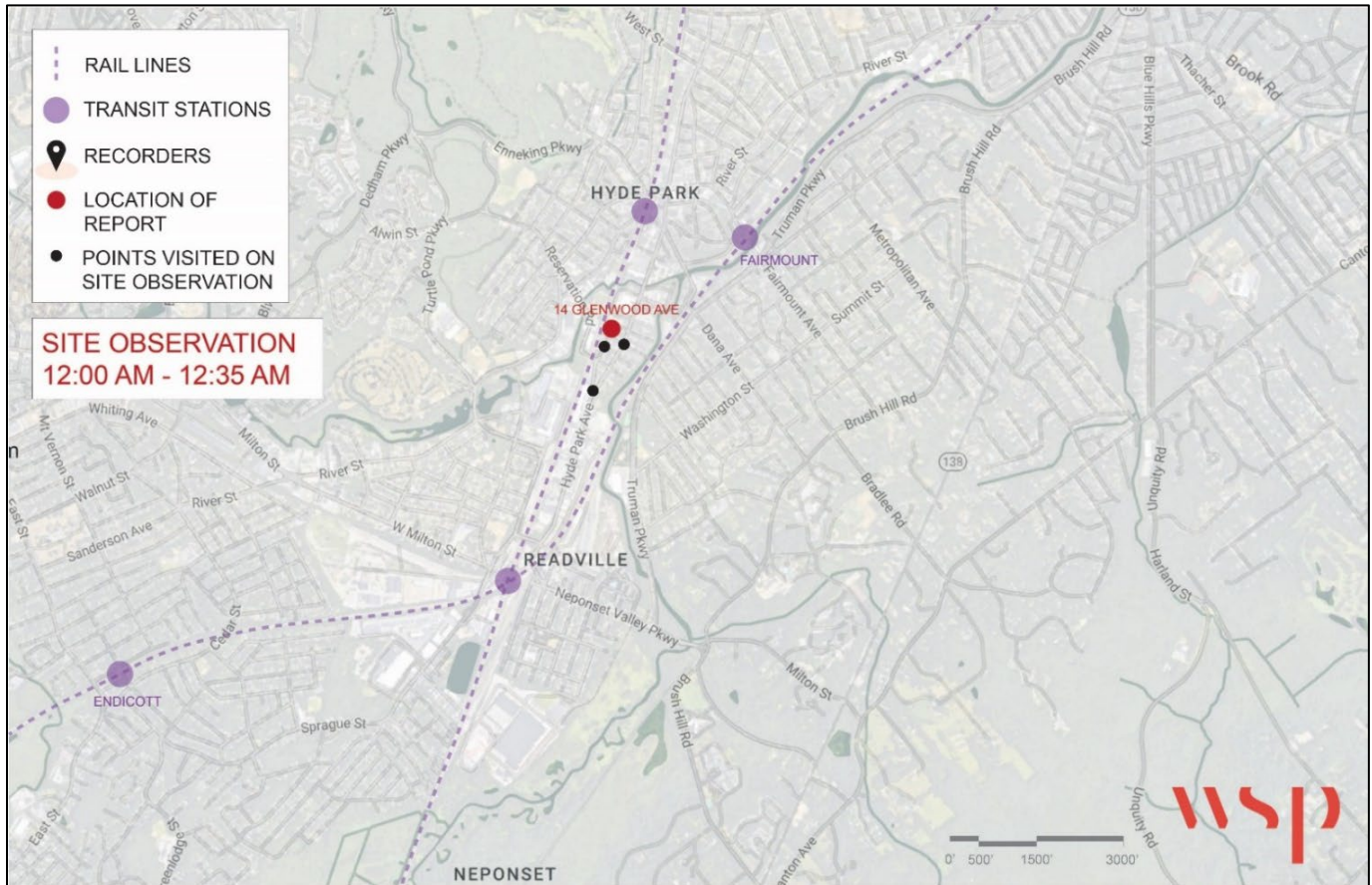
4.2 AREA 2: 14 GLENWOOD AVENUE

The area of 14 Glenwood Avenue frequently reported noises in the hours of 12 AM – 2 AM described as low humming. With the intent of experiencing the noises, the Study Team visited the location and its surrounding neighborhood from 12 AM – 12:35 AM. Throughout the duration of the visit, the streets were noisy with fire trucks, buses, helicopters, and distant trains. Overall, the area had a mix of urban sounds with no distinct source to pinpoint.

Table 4-2 Site Observations

DATE	TIME	LOCATION	OBSERVATION
7/21/2023	12:03 AM	Winter Street	2 Fire Trucks Passing
7/21/2023	12:04 AM	Winter Street	Train Passing
7/21/2023	12:05 AM	Winter Street	Train Passing
7/21/2023	12:10 AM	Winter Street	Distant Train Horn
7/21/2023	12:12 AM	Glenwood Ave	Distant Truck Movement
7/21/2023	12:12 AM	Glenwood Ave	Distant Train Movement
7/21/2023	12:13 AM	Hyde Park Ave	Helicopter Overflight
7/21/2023	12:23 AM	Hyde Park Ave	Train Horns
7/21/2023	12:30 AM	Reservation Road	Train Horns
7/21/2023	12:31 AM	Winter Street	Bus Air Brakes

Figure 4-3 Locations Visited in Area 2



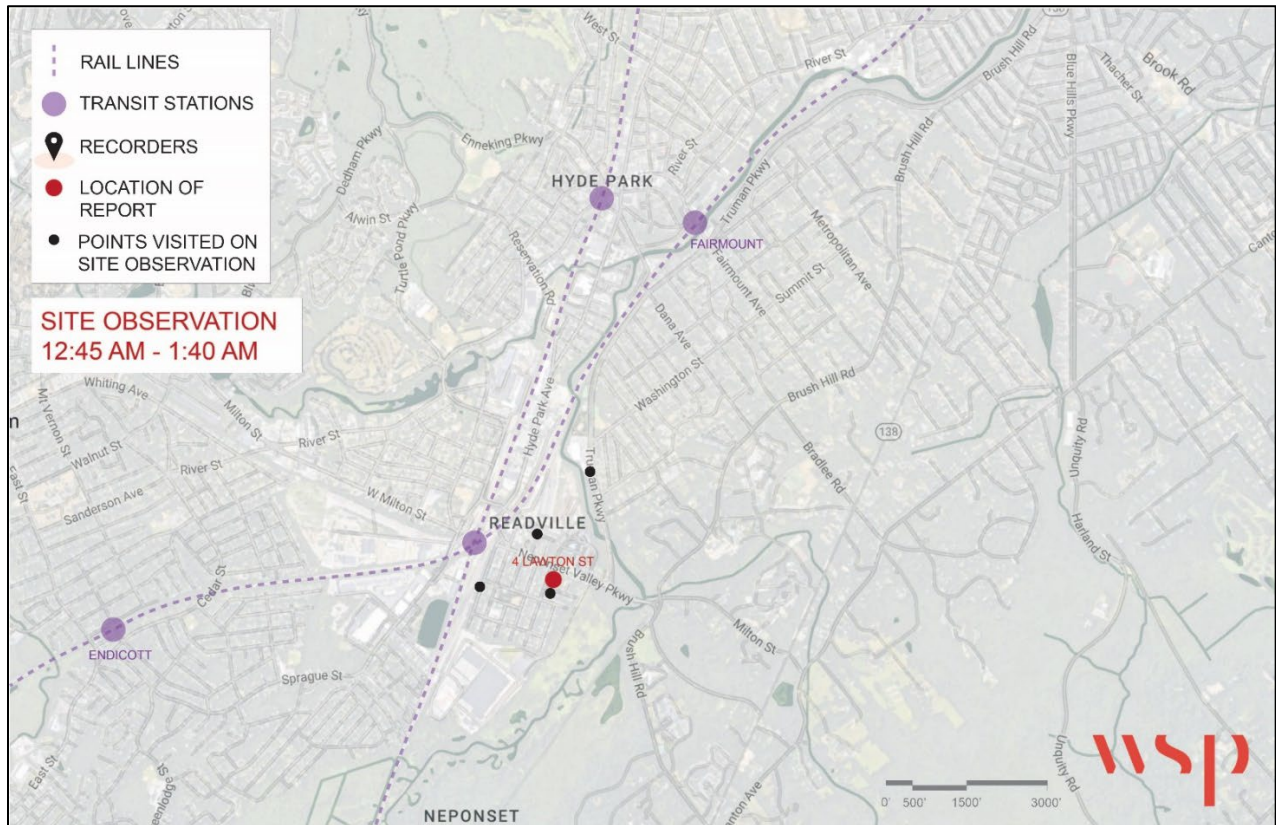
4.3 AREA 3: 4 LAWTON STREET

Throughout the month-long study period, the neighborhood of 4 Lawton Street received numerous complaints of vibrating – suggesting a train idle nearby in the typical hours of 12 AM – 4 AM. The Study Team observed this area from multiple points in attempt to experience any noises. When observing the neighborhood south of Neponset Valley Parkway, there was no noise detected other than typical Urban sounds such as AC Units. When visiting neighborhood north of Neponset Valley Parkway on Wolcott Street, train sounds were present. A train was heard idling in the yard nearby, along with frequent brakes and horns. Although Wolcott Street was noisy, when traveling to the area of 1065 Truman Hwy on the opposite side of the Neponset River, the idling had become almost undetectable as a low distant hum.

Table 4-3 Area 3 Site Observations

DATE	TIME	LOCATION	OBSERVATION
7/21/2023	12:45 AM - 1:00 AM	Prescott Street	Typical Urban Noise (AC Units, Humming of Lights, etc.)
7/21/2023	1:04 AM - 1:20 AM	Wolcott St	Constant Humming, Frequent Train Horns, Train Brakes
7/21/2023	1:05 AM	Wolcott St	Distant Train Horn
7/21/2023	1:06 AM	Wolcott St	Train Movement
7/21/2023	1:26 AM - 1:40 AM	1065 Truman Hwy	Very Low Hum from Distant Idling Locomotive
7/21/2023	1:28 AM	1065 Truman Hwy	Car Locking Beep
7/21/2023	1:34 AM	1065 Truman Hwy	Truck Passing

Figure 4-4 Locations Visited in Area 3



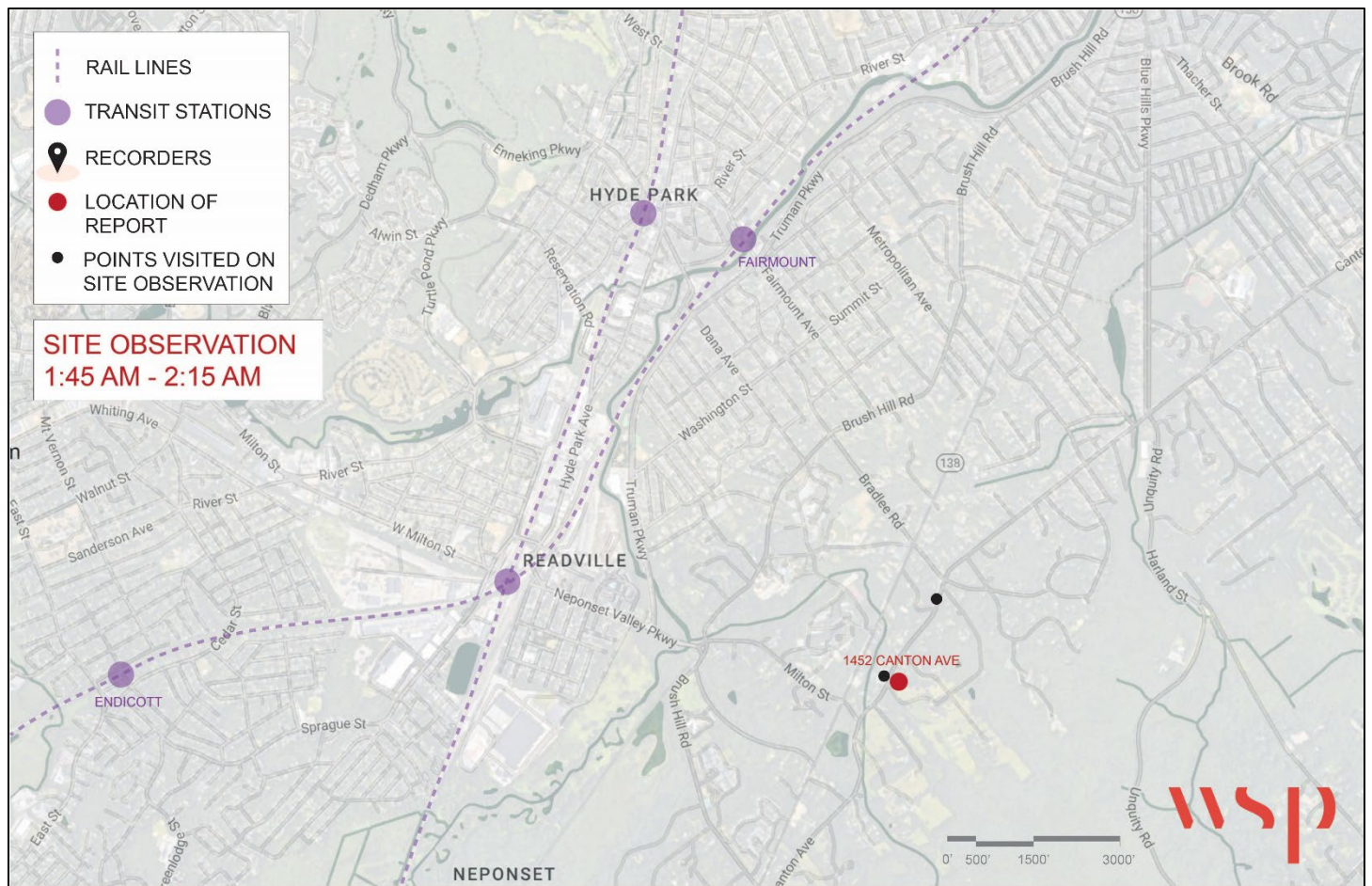
4.4 AREA 4: 1452 CANTON AVENUE

The Study Team visited the area of 1452 Canton Ave from the hours of 1:45 AM – 2:15 AM on July 21st, to observe community reports of noise in the night and early morning hours. Multiple points on Canton Ave were observed to hear any noise. Throughout the duration of the time in the area, it was observed to be completely silent other than a plane pass by at 1:47 AM.

Table 4-4 Area 4 Site Observations





DATE	TIME	LOCATION	OBSERVATION
7/21/2023	1:46 AM - 2:15 AM	1424 Canton Ave	Silence
7/21/2023	1:47 AM	1452 Canton Ave	Plane Overhead

Figure 4-5 Locations Visited in Area 4

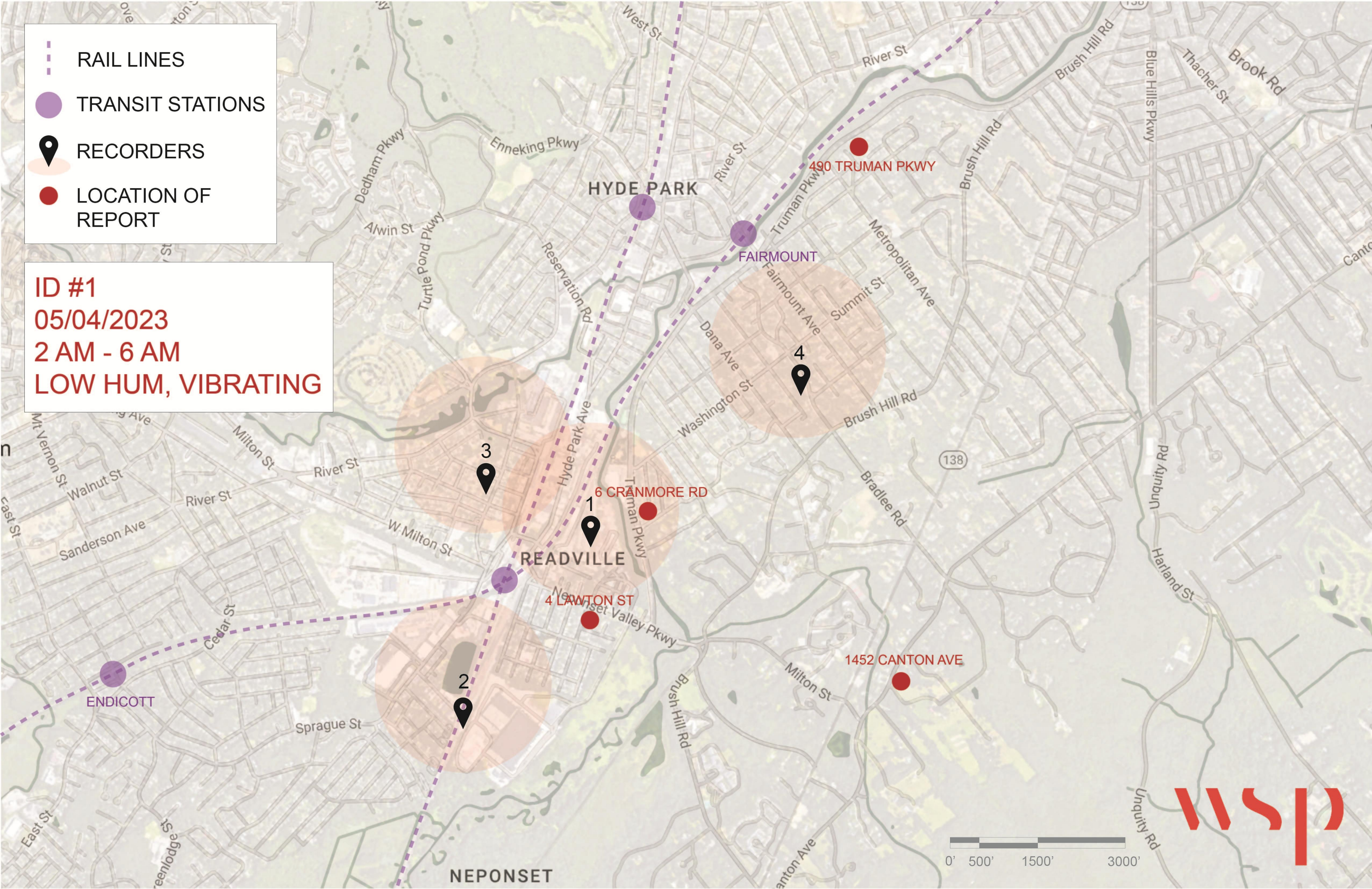






APPENDIX

A MAPS OF EACH UNIQUE COMPLAINT

-  RAIL LINES
-  TRANSIT STATIONS
-  RECORDERS
-  LOCATION OF REPORT





ID #1
05/04/2023
2 AM - 6 AM
LOW HUM, VIBRATING



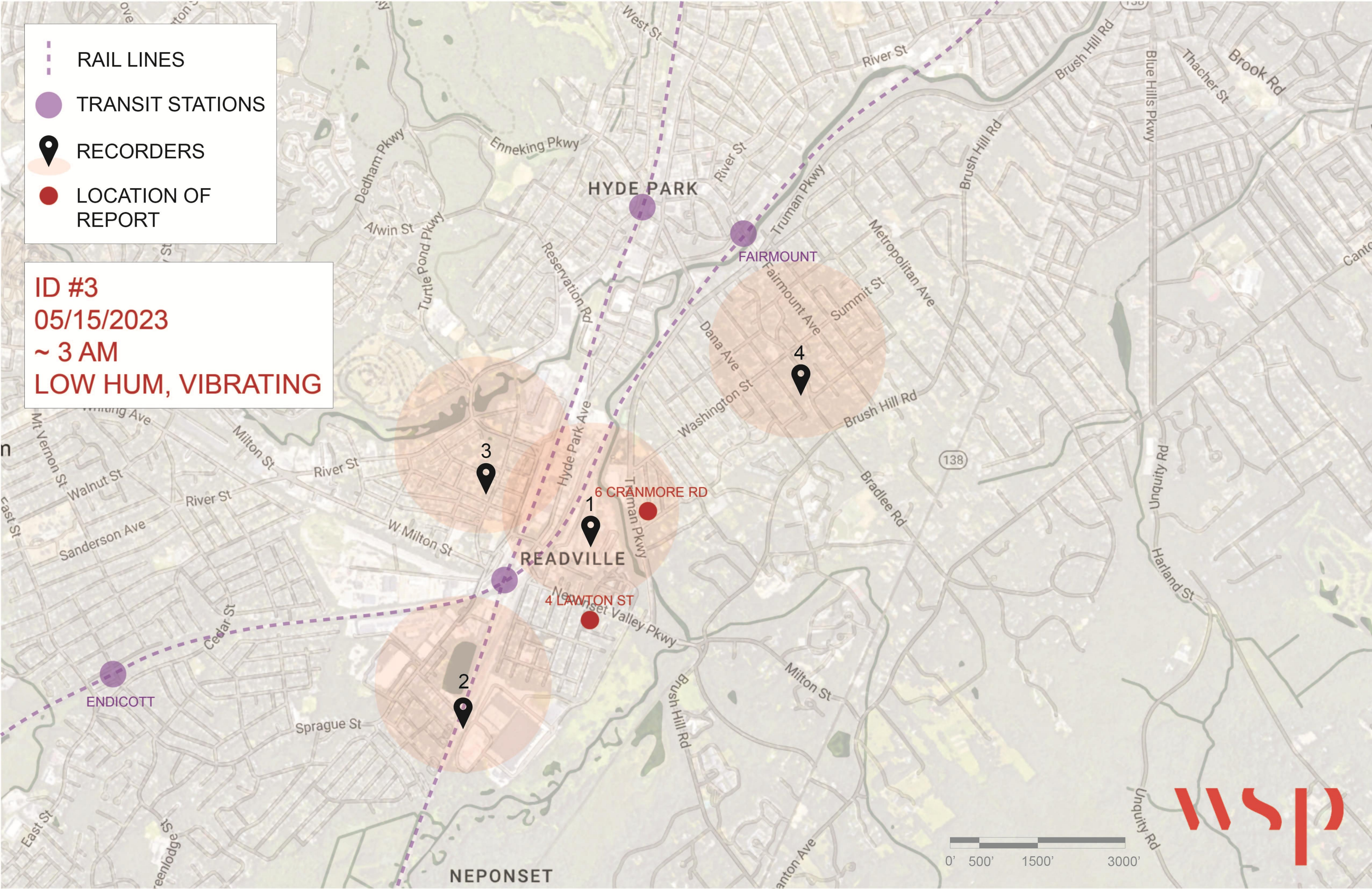
-  RAIL LINES
-  TRANSIT STATIONS
-  RECORDERS
-  LOCATION OF REPORT





ID #2
05/12/2023
12 AM - 8 AM
LOW HUM, VIBRATING,
HORNS



-  RAIL LINES
-  TRANSIT STATIONS
-  RECORDERS
-  LOCATION OF REPORT





ID #3
05/15/2023
~ 3 AM
LOW HUM, VIBRATING



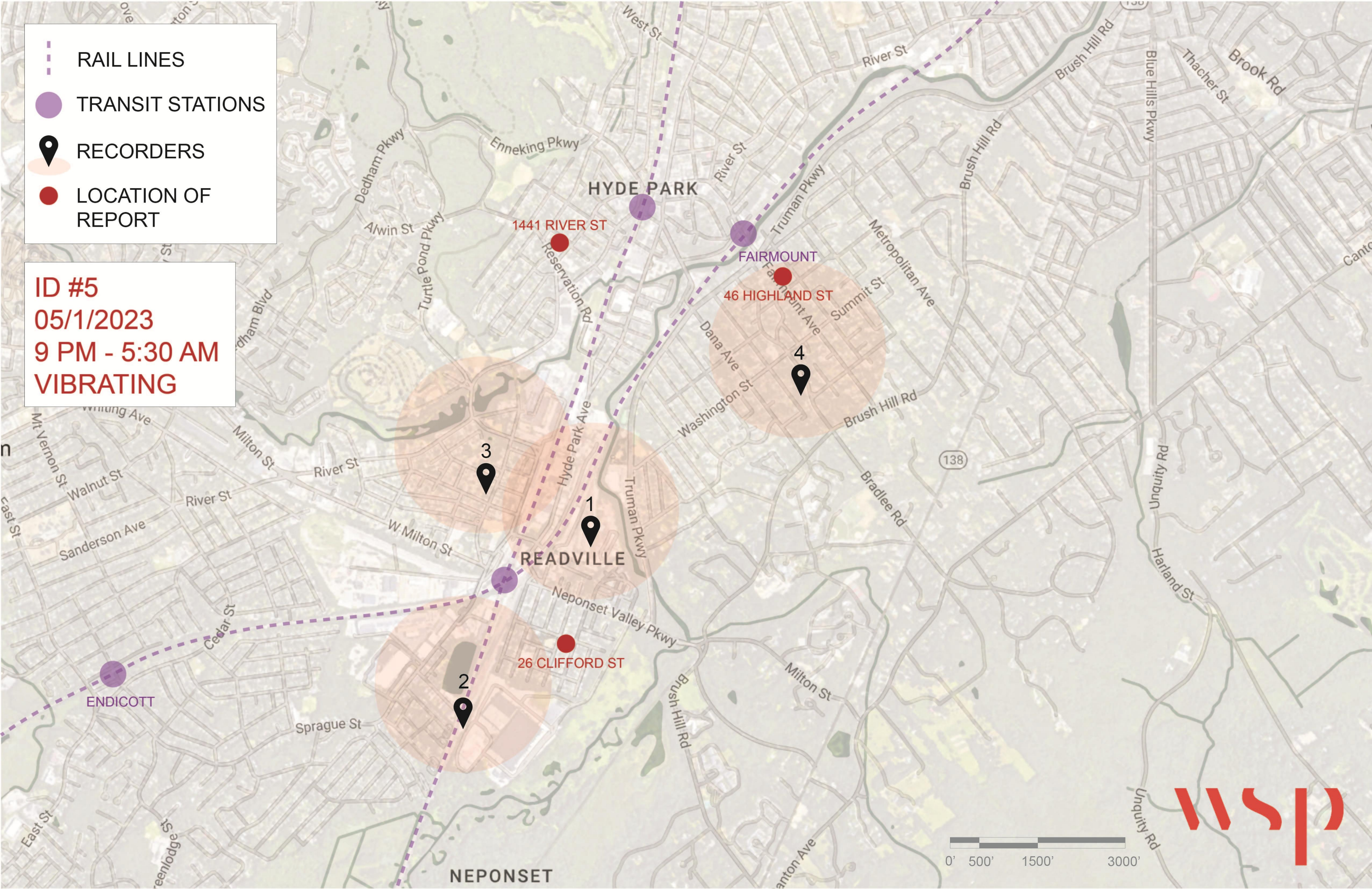
-  RAIL LINES
-  TRANSIT STATIONS
-  RECORDERS
-  LOCATION OF REPORT





ID #4
05/16/2023
12 AM - 2 AM
LOW HUM, VIBRATING,
WHISTLES, STARTING
& BREAKING



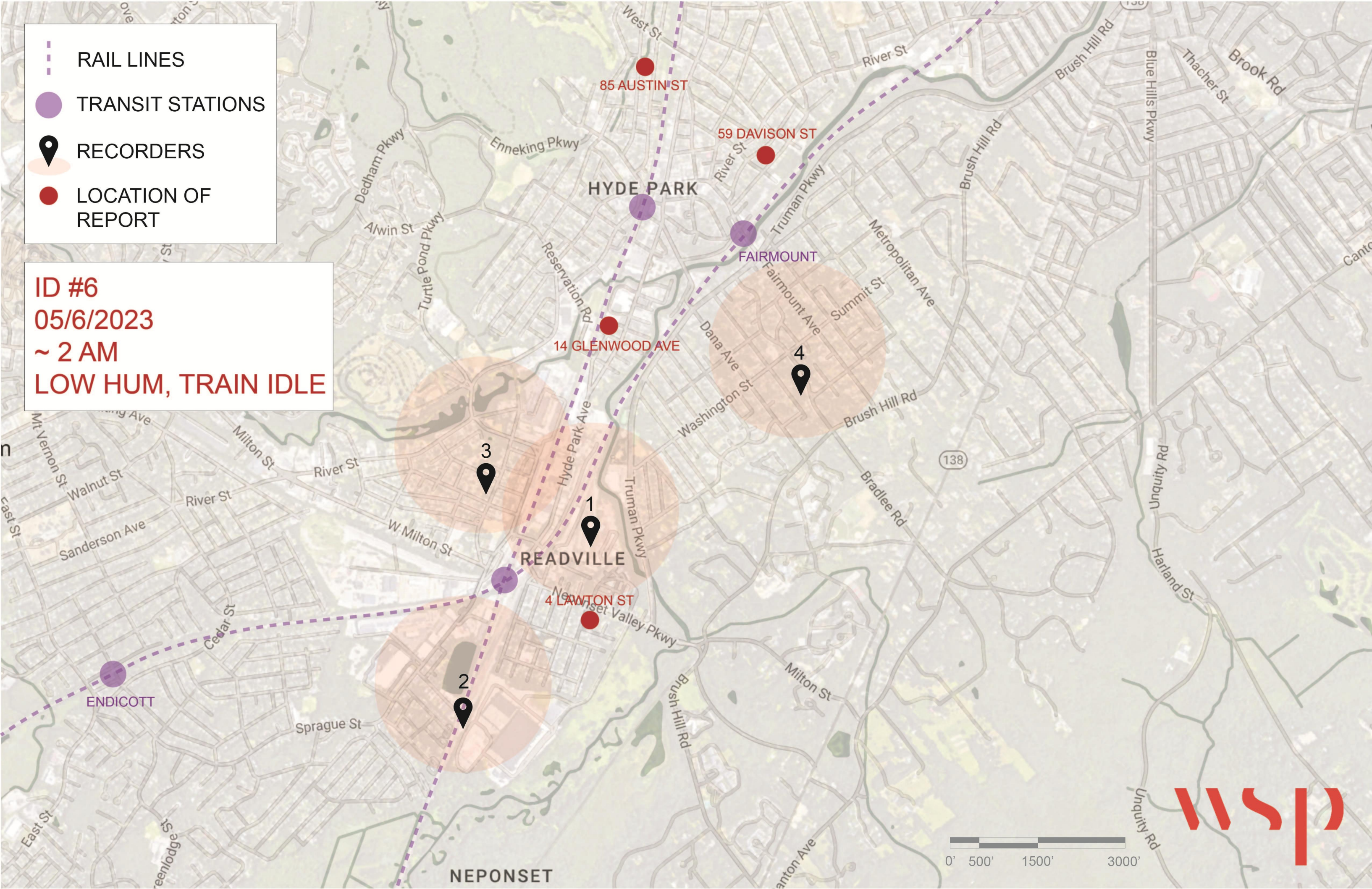
-  RAIL LINES
-  TRANSIT STATIONS
-  RECORDERS
-  LOCATION OF REPORT





ID #5
05/1/2023
9 PM - 5:30 AM
VIBRATING



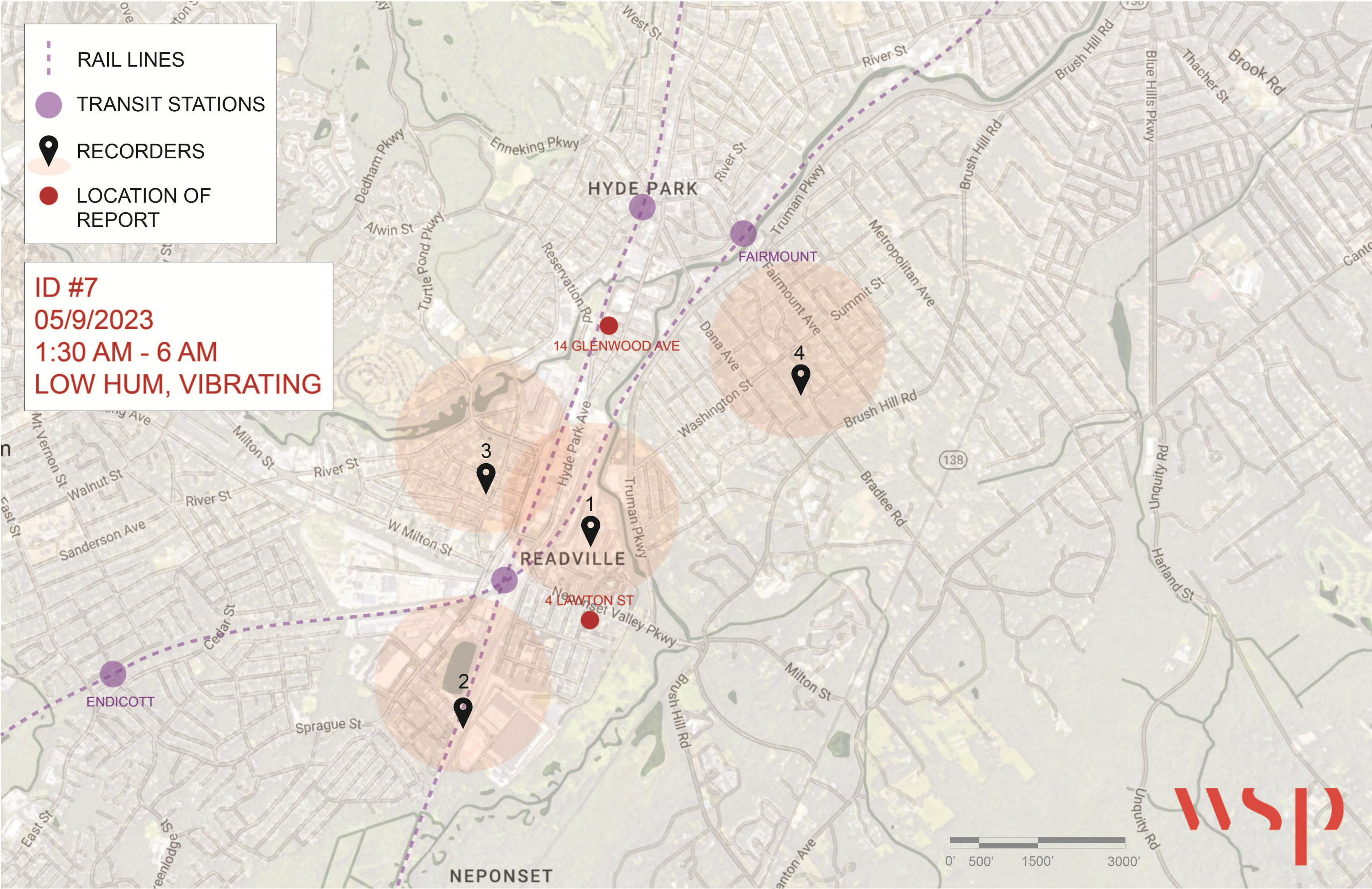
-  RAIL LINES
-  TRANSIT STATIONS
-  RECORDERS
-  LOCATION OF REPORT





ID #6
05/6/2023
~ 2 AM
LOW HUM, TRAIN IDLE



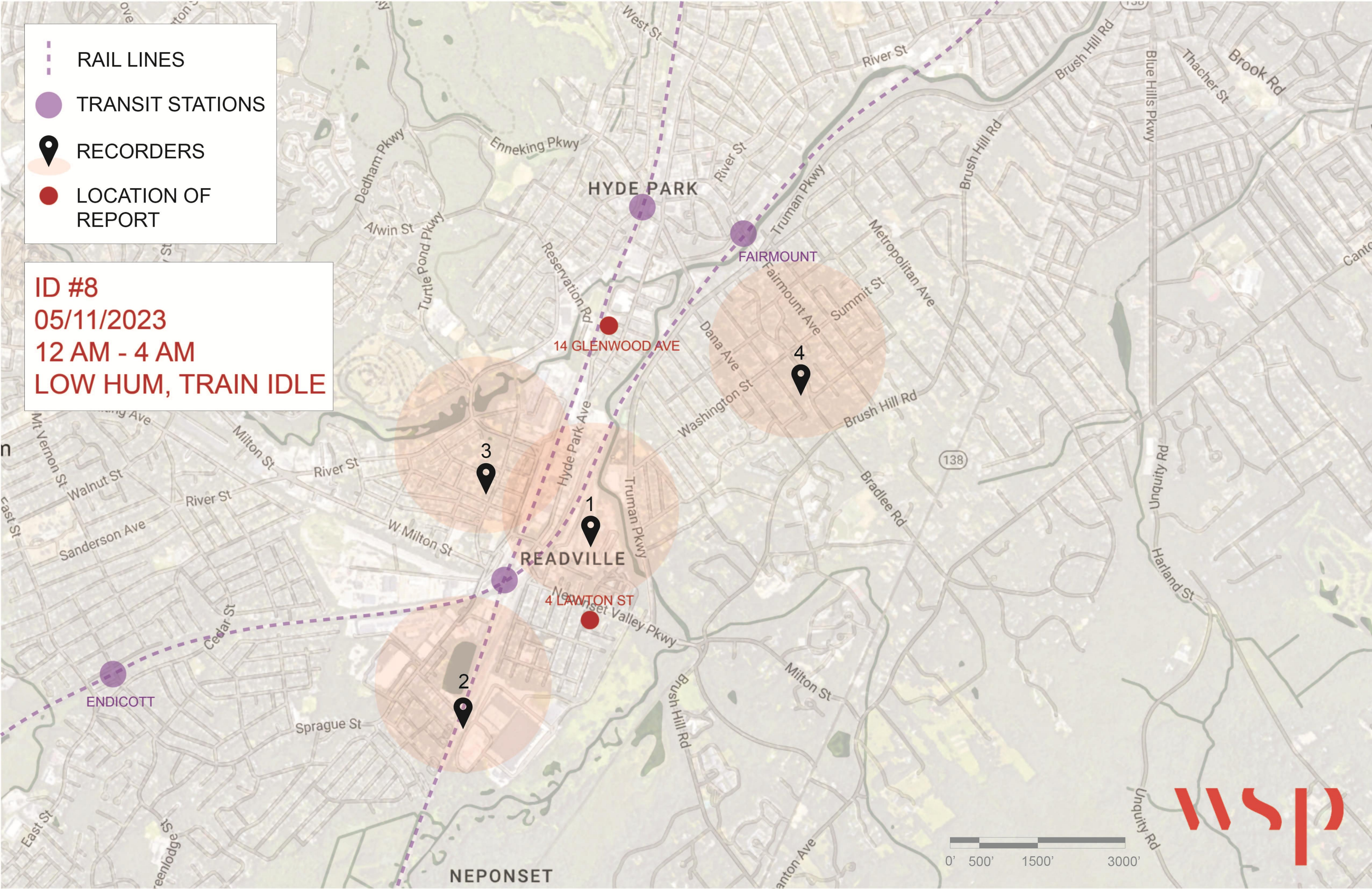
-  RAIL LINES
-  TRANSIT STATIONS
-  RECORDERS
-  LOCATION OF REPORT





ID #7
05/9/2023
1:30 AM - 6 AM
LOW HUM, VIBRATING



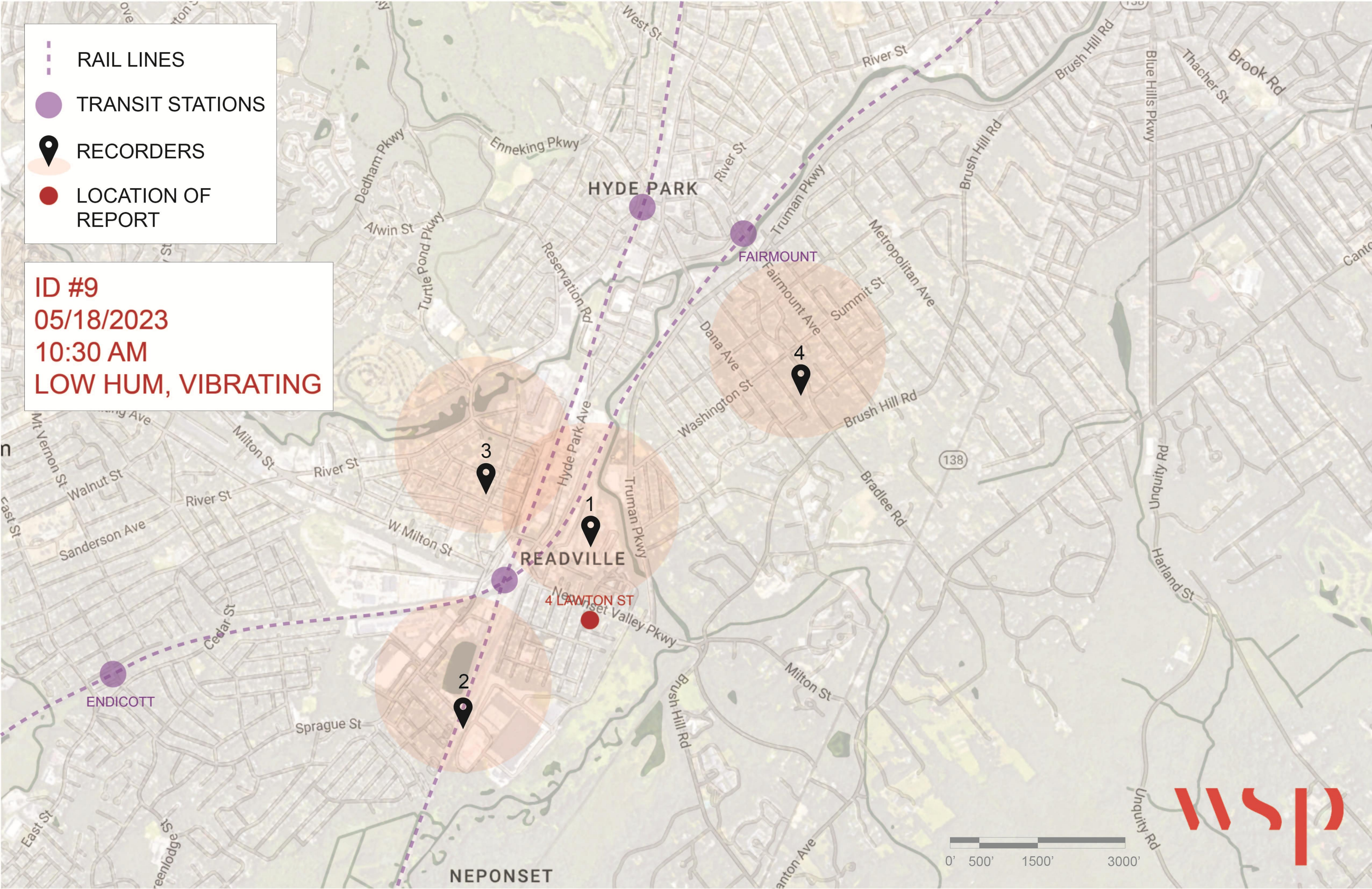
-  RAIL LINES
-  TRANSIT STATIONS
-  RECORDERS
-  LOCATION OF REPORT





ID #8
05/11/2023
12 AM - 4 AM
LOW HUM, TRAIN IDLE



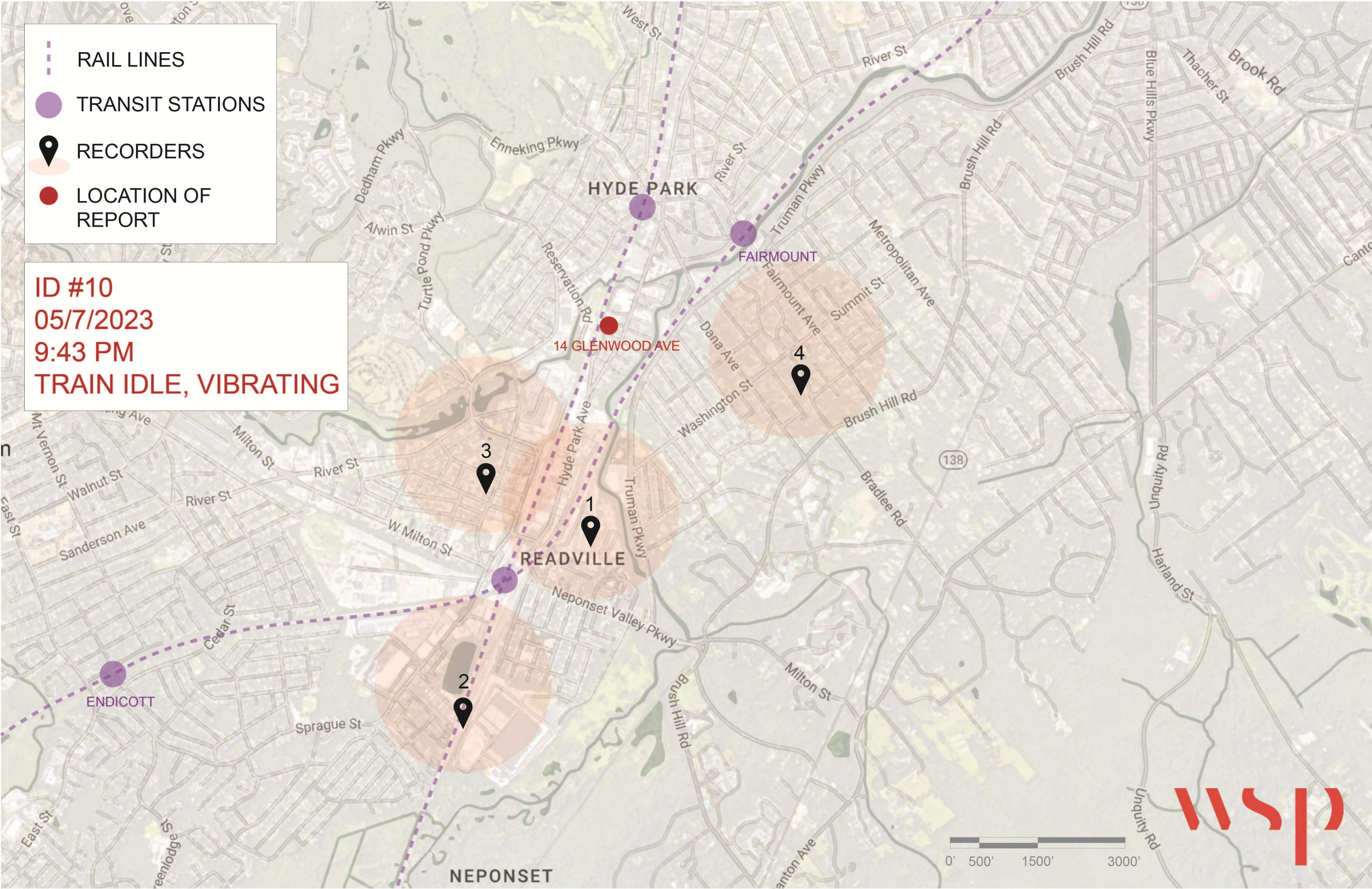
-  RAIL LINES
-  TRANSIT STATIONS
-  RECORDERS
-  LOCATION OF REPORT





ID #9
05/18/2023
10:30 AM
LOW HUM, VIBRATING



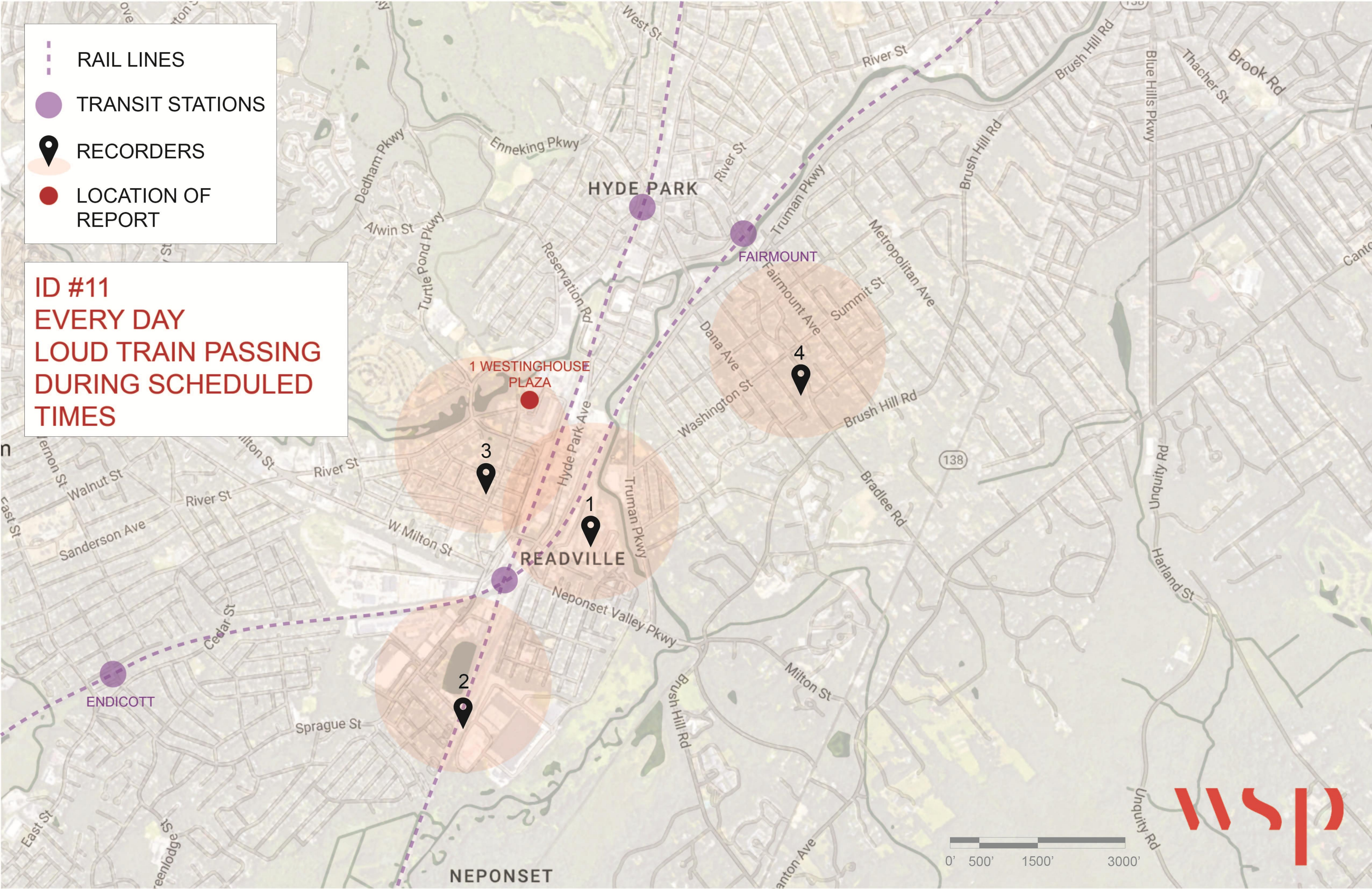
-  RAIL LINES
-  TRANSIT STATIONS
-  RECORDERS
-  LOCATION OF REPORT





ID #10
05/7/2023
9:43 PM
TRAIN IDLE, VIBRATING



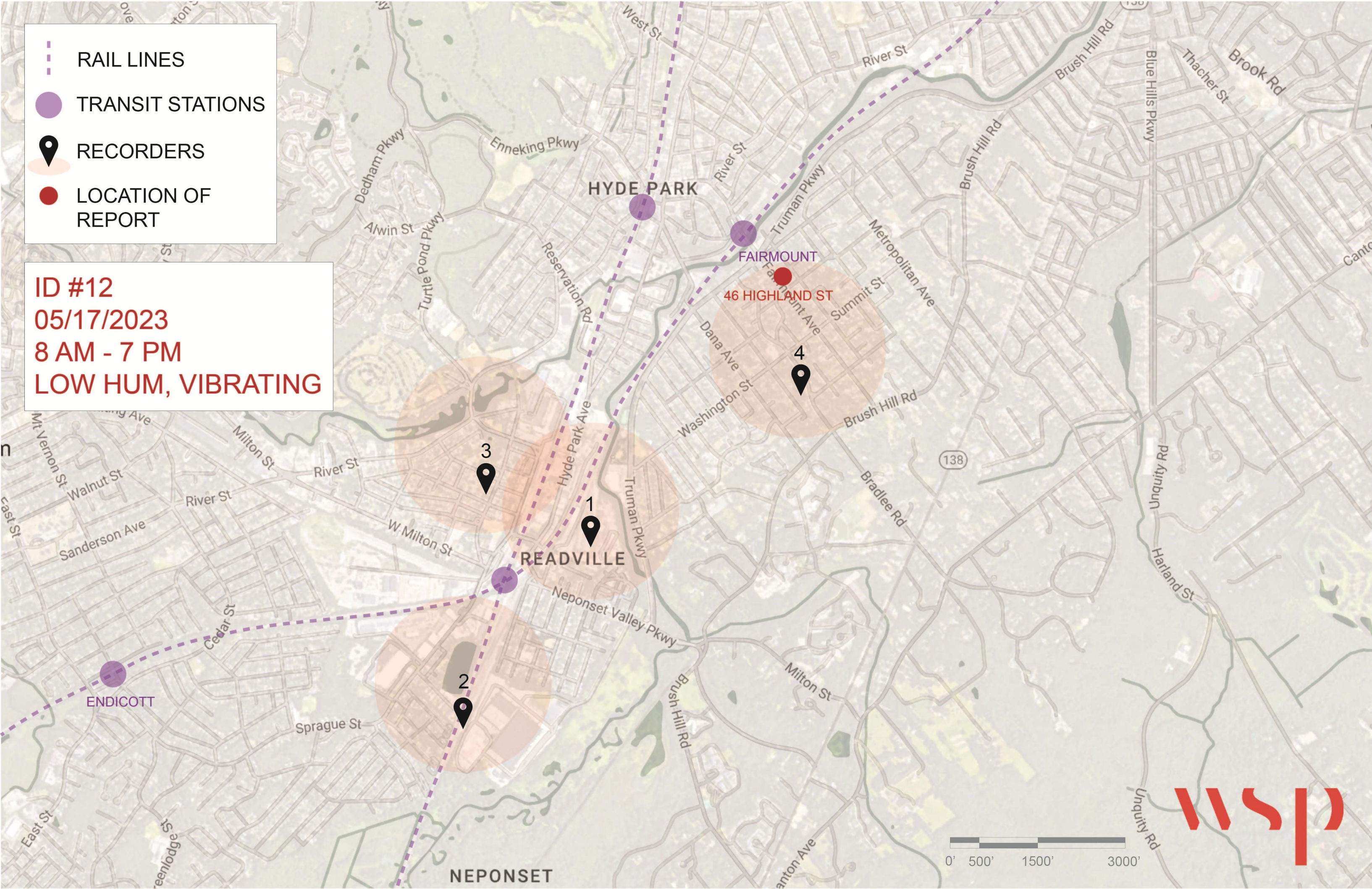
-  RAIL LINES
-  TRANSIT STATIONS
-  RECORDERS
-  LOCATION OF REPORT





ID #11
EVERY DAY
LOUD TRAIN PASSING
DURING SCHEDULED
TIMES



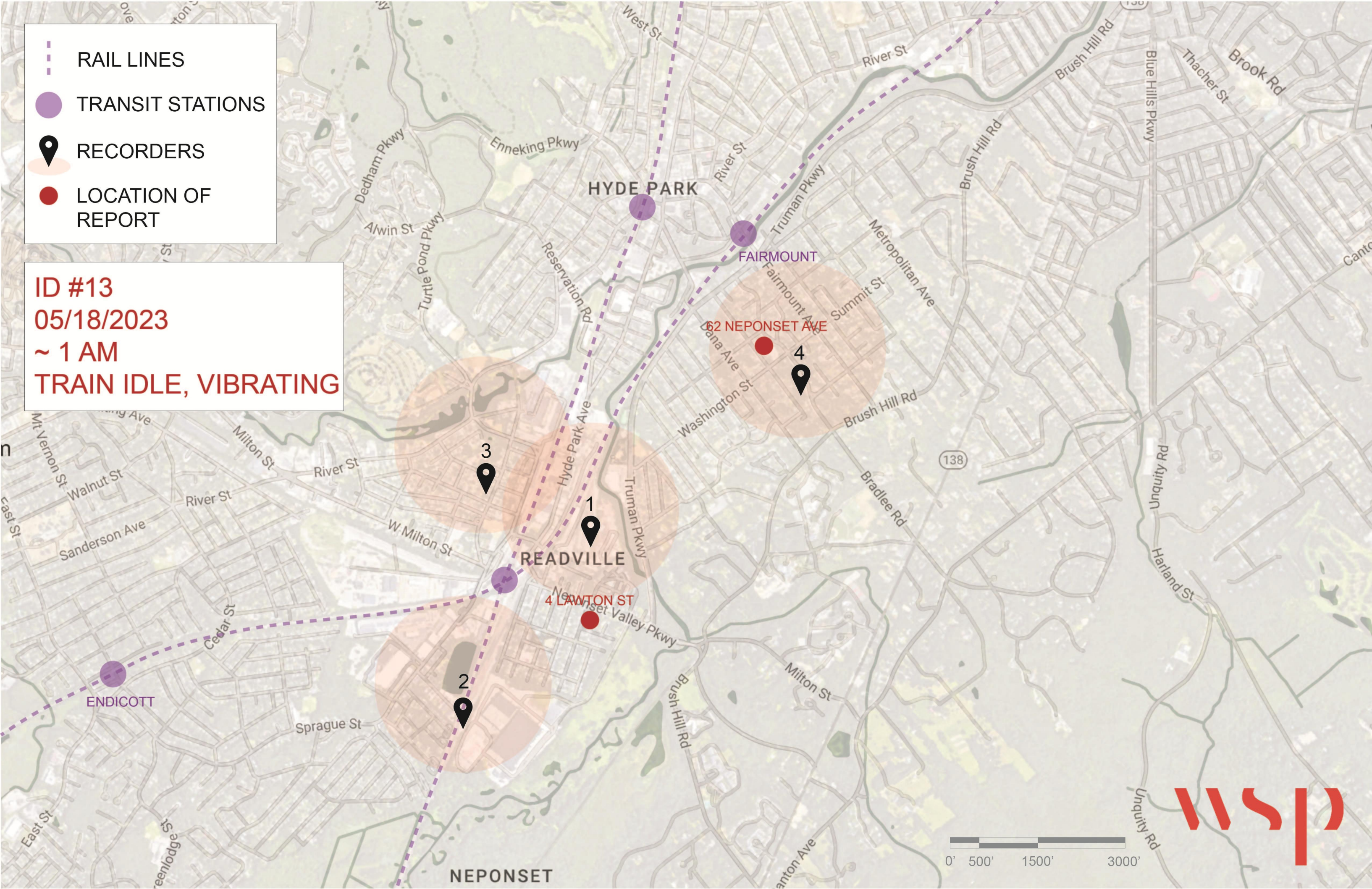
-  RAIL LINES
-  TRANSIT STATIONS
-  RECORDERS
-  LOCATION OF REPORT





ID #12
05/17/2023
8 AM - 7 PM
LOW HUM, VIBRATING



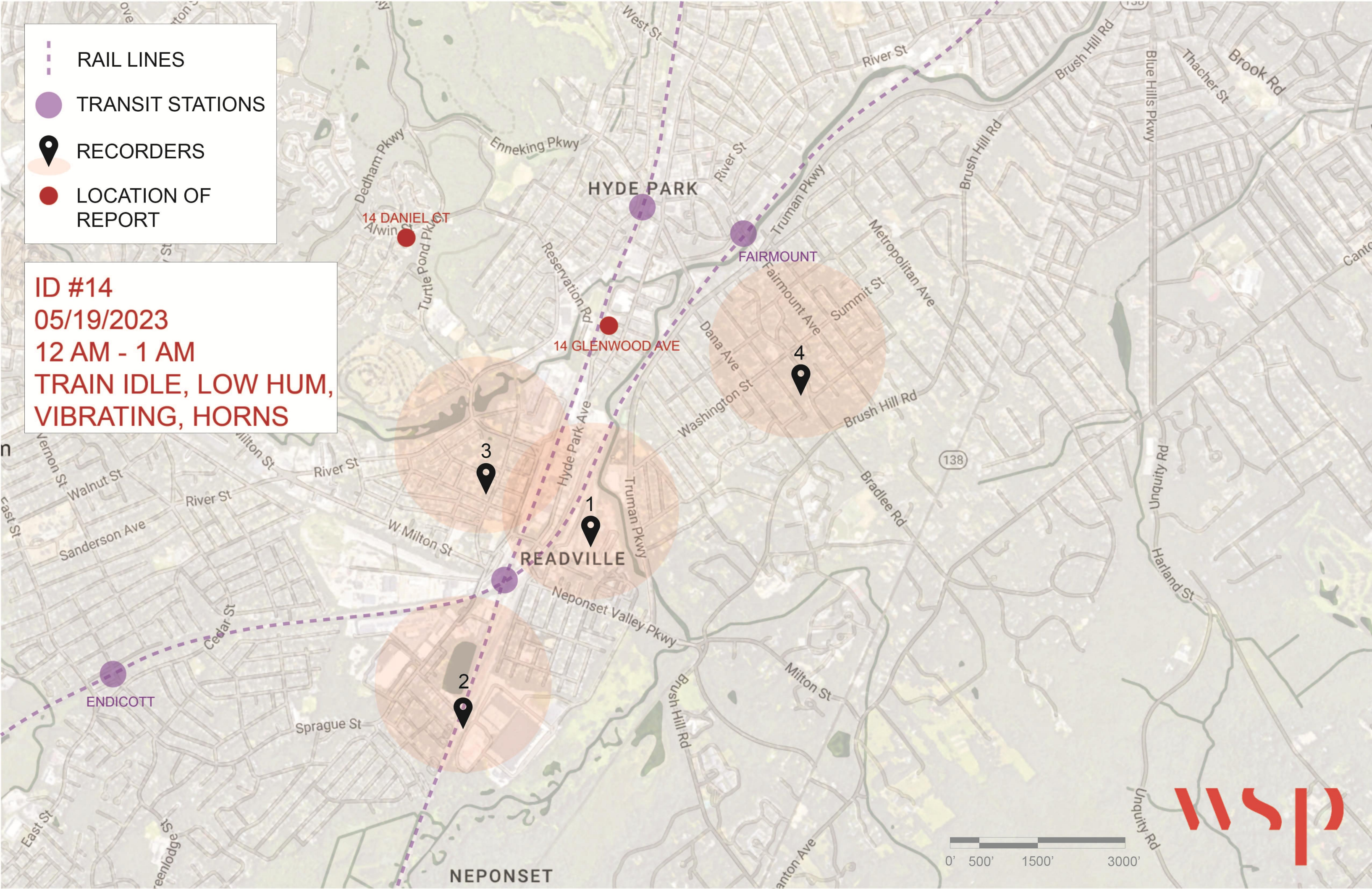
-  RAIL LINES
-  TRANSIT STATIONS
-  RECORDERS
-  LOCATION OF REPORT





ID #13
05/18/2023
~ 1 AM
TRAIN IDLE, VIBRATING



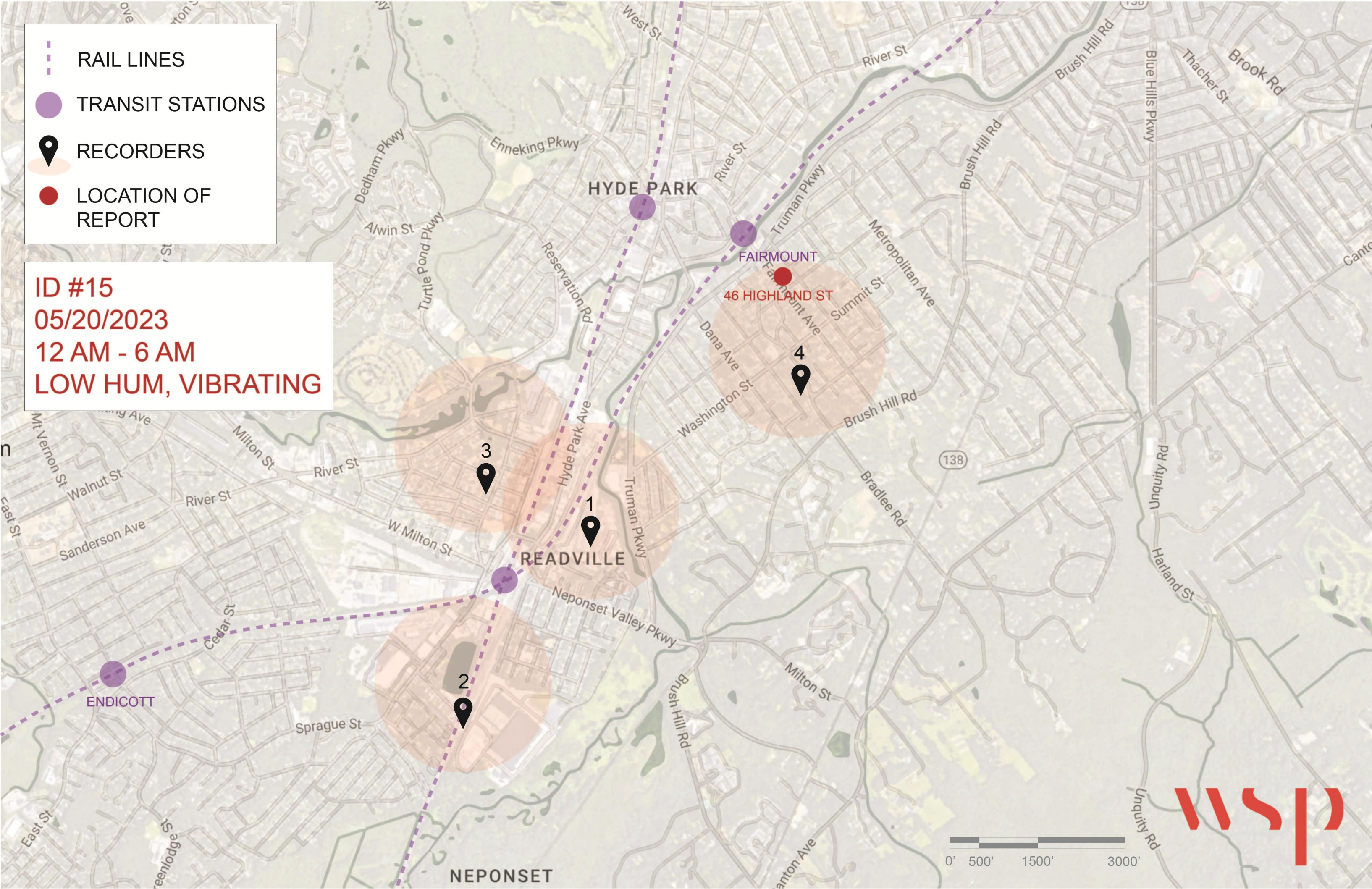
-  RAIL LINES
-  TRANSIT STATIONS
-  RECORDERS
-  LOCATION OF REPORT





ID #14
05/19/2023
12 AM - 1 AM
TRAIN IDLE, LOW HUM,
VIBRATING, HORNS



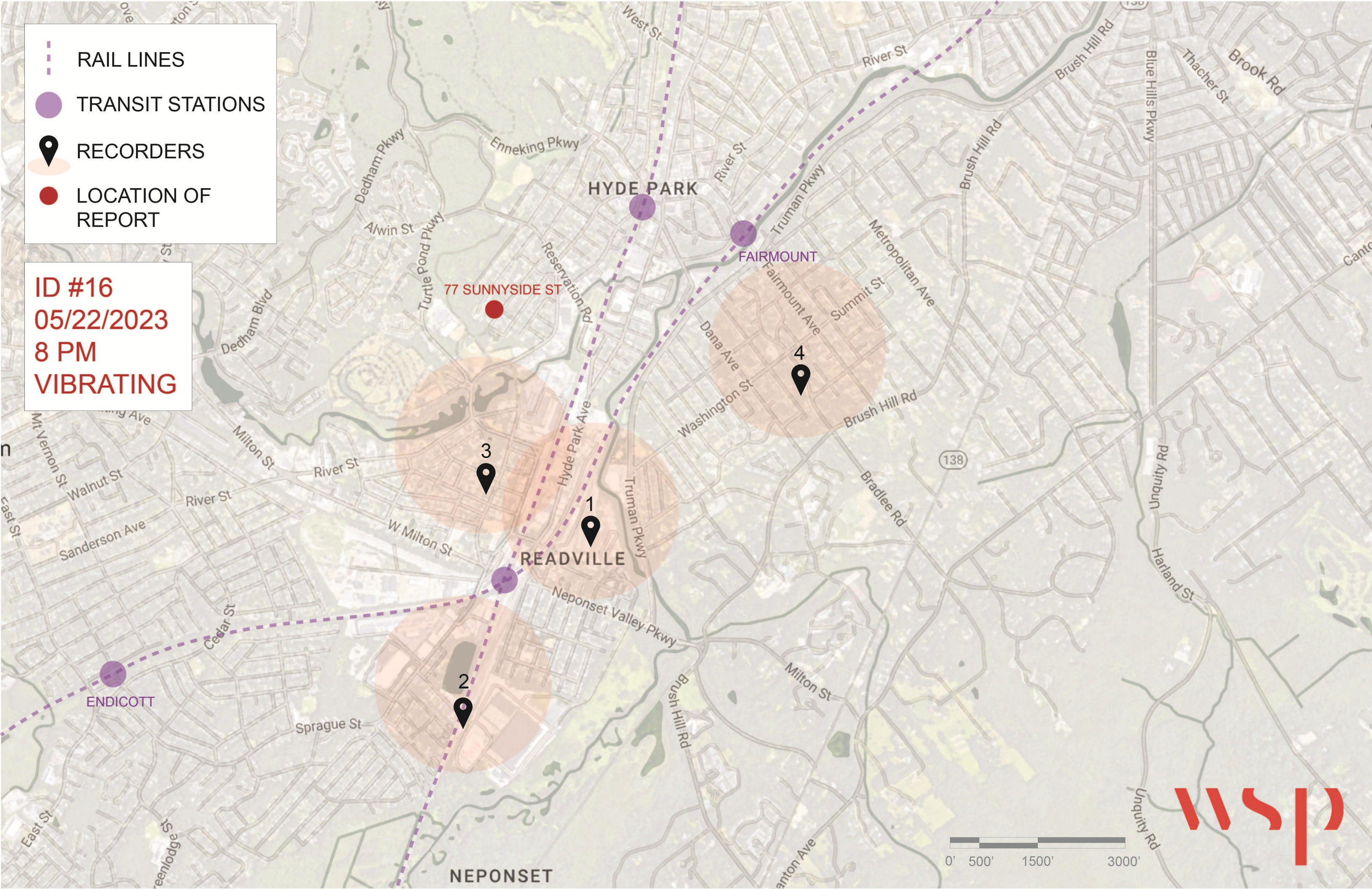
-  RAIL LINES
-  TRANSIT STATIONS
-  RECORDERS
-  LOCATION OF REPORT





ID #15
05/20/2023
12 AM - 6 AM
LOW HUM, VIBRATING



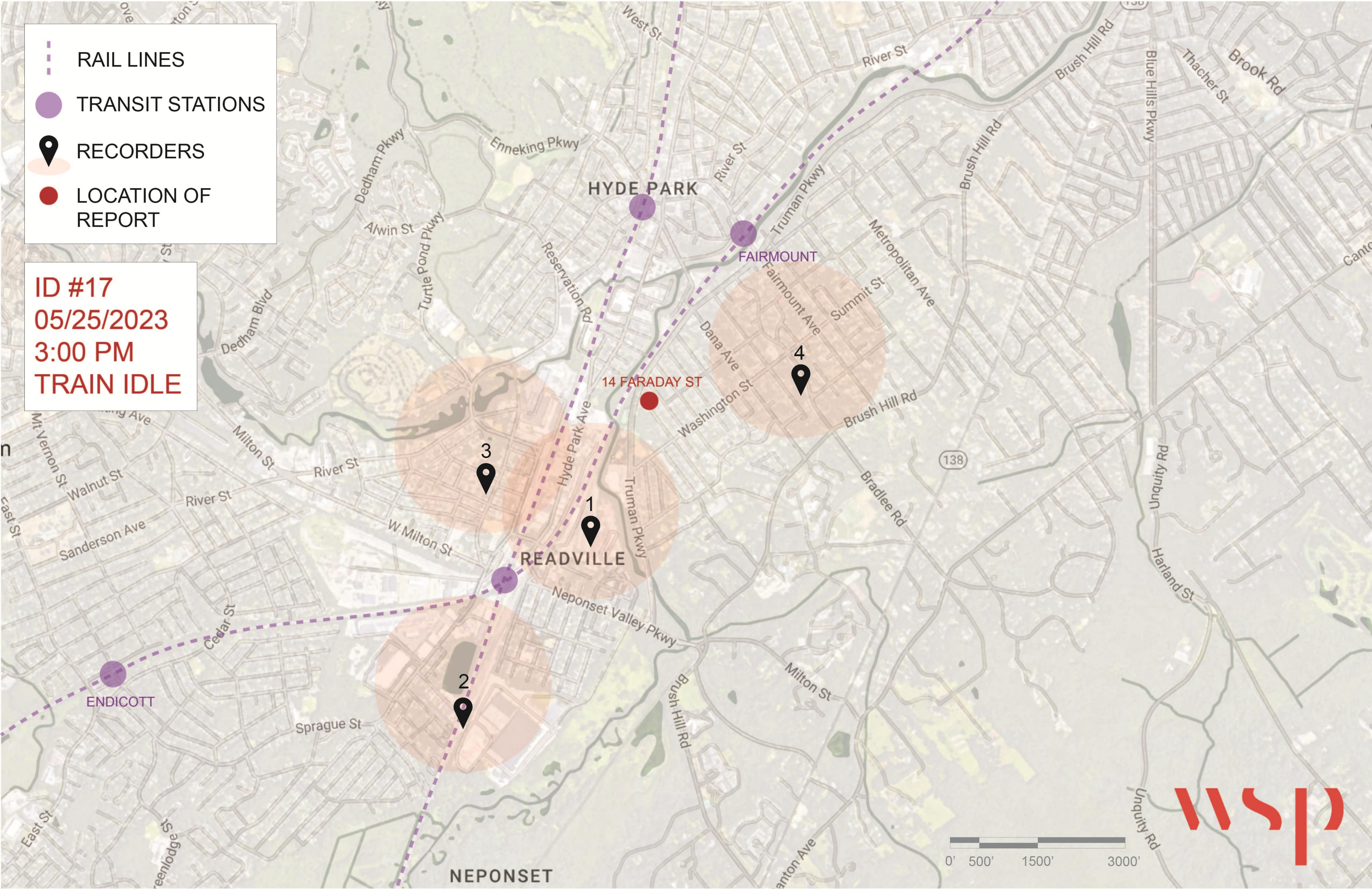
-  RAIL LINES
-  TRANSIT STATIONS
-  RECORDERS
-  LOCATION OF REPORT





ID #16
05/22/2023
8 PM
VIBRATING



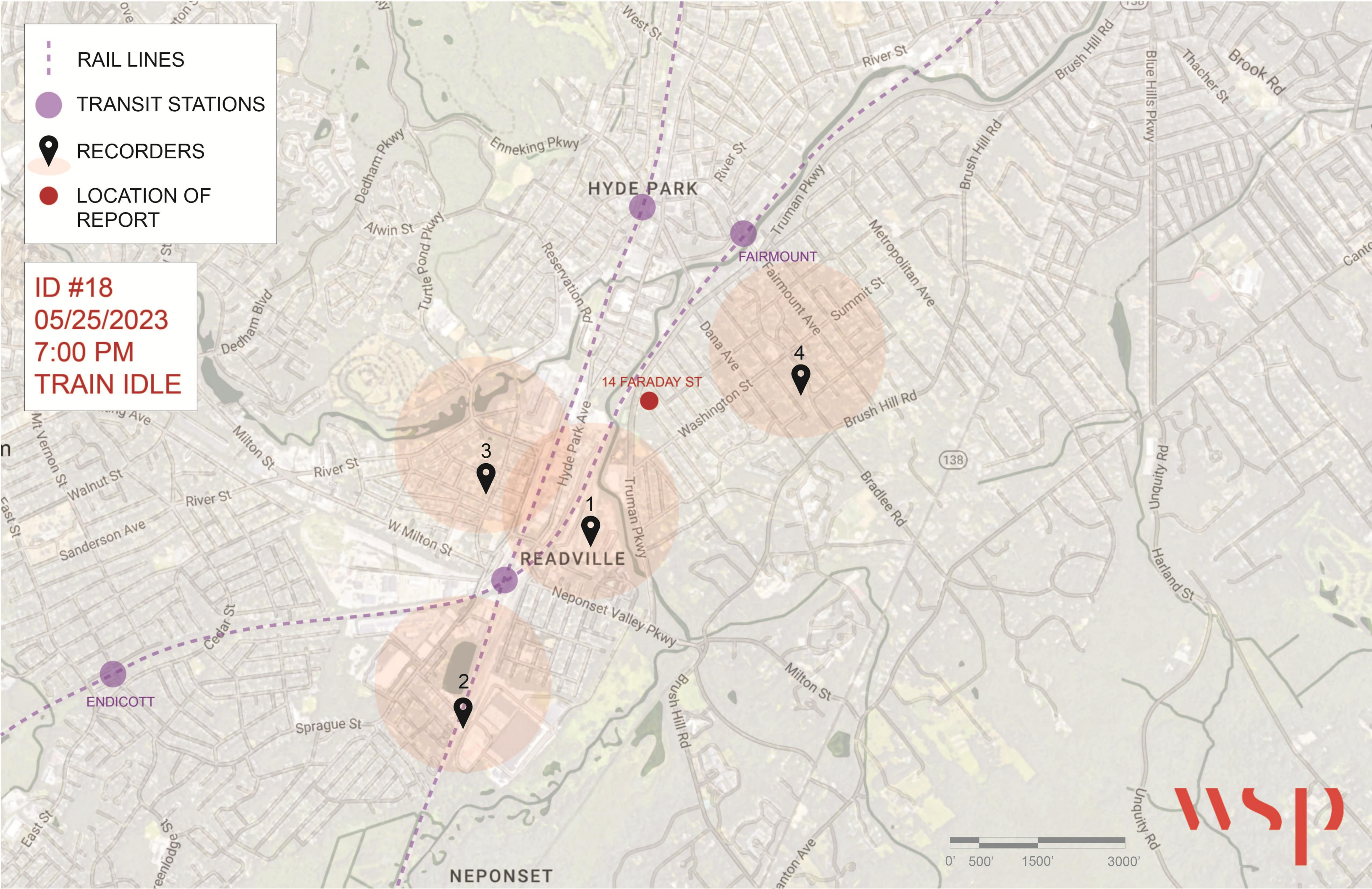
-  RAIL LINES
-  TRANSIT STATIONS
-  RECORDERS
-  LOCATION OF REPORT





ID #17
05/25/2023
3:00 PM
TRAIN IDLE



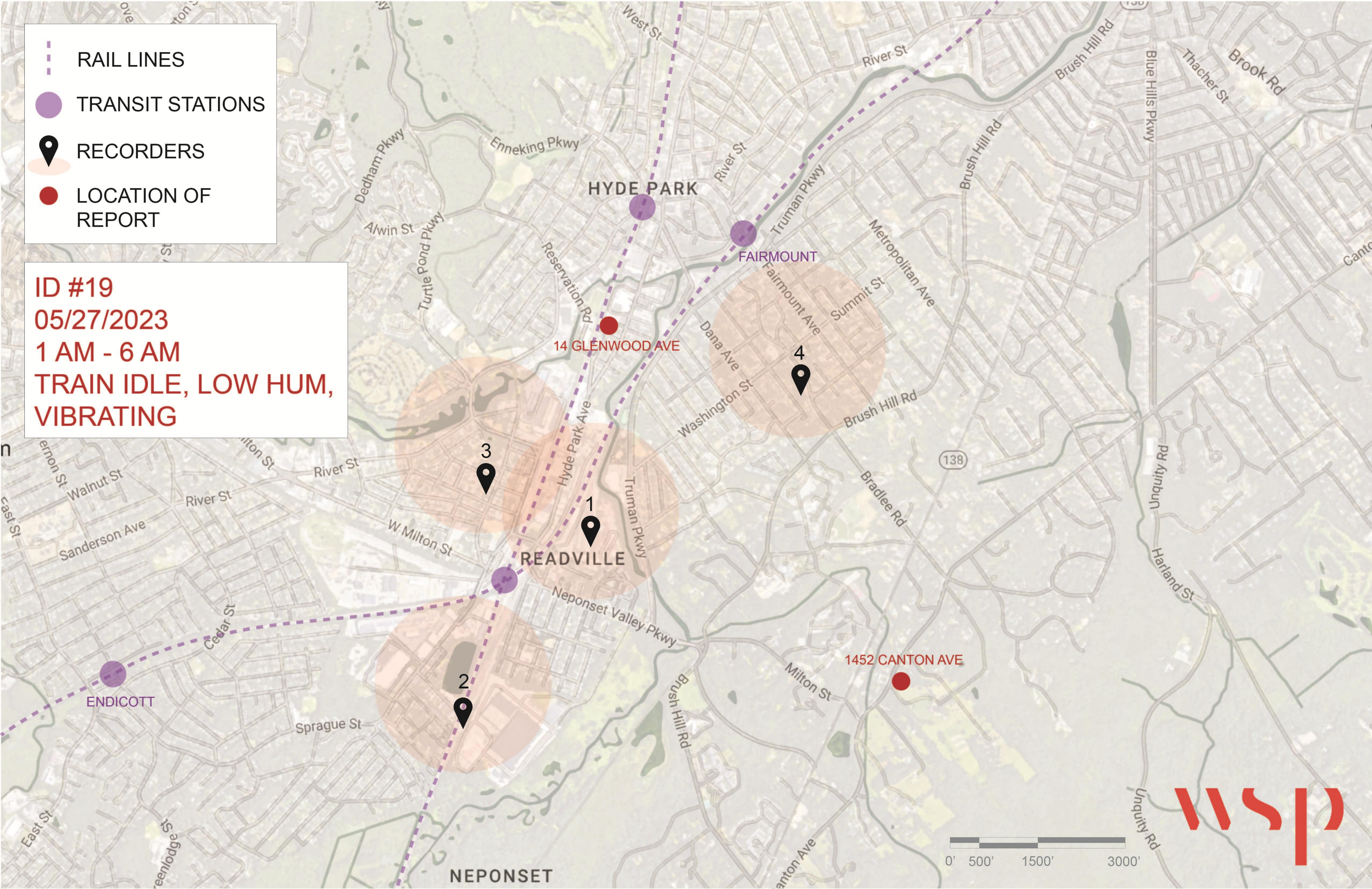
-  RAIL LINES
-  TRANSIT STATIONS
-  RECORDERS
-  LOCATION OF REPORT





ID #18
05/25/2023
7:00 PM
TRAIN IDLE



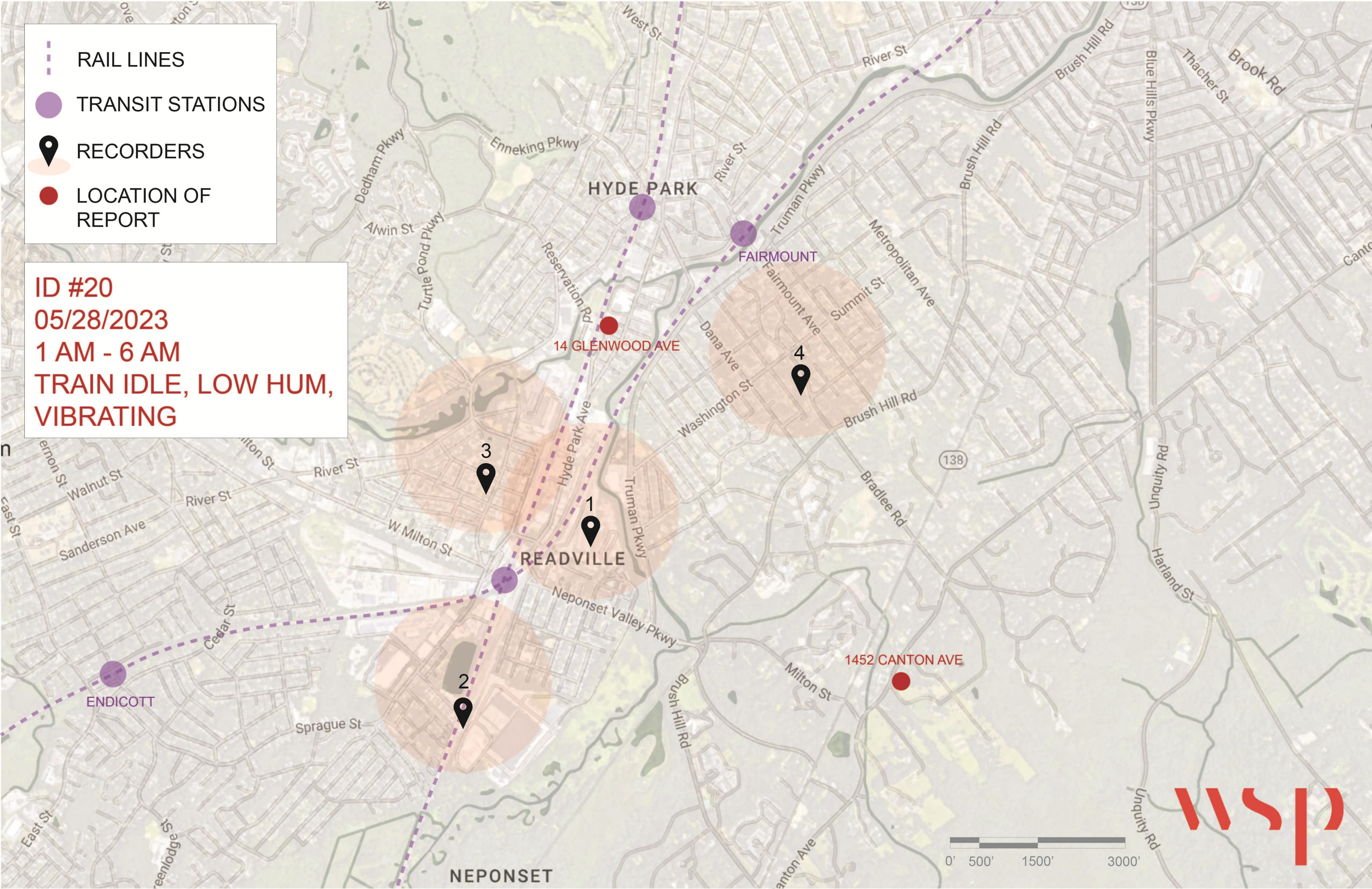
-  RAIL LINES
-  TRANSIT STATIONS
-  RECORDERS
-  LOCATION OF REPORT





ID #19
05/27/2023
1 AM - 6 AM
TRAIN IDLE, LOW HUM,
VIBRATING



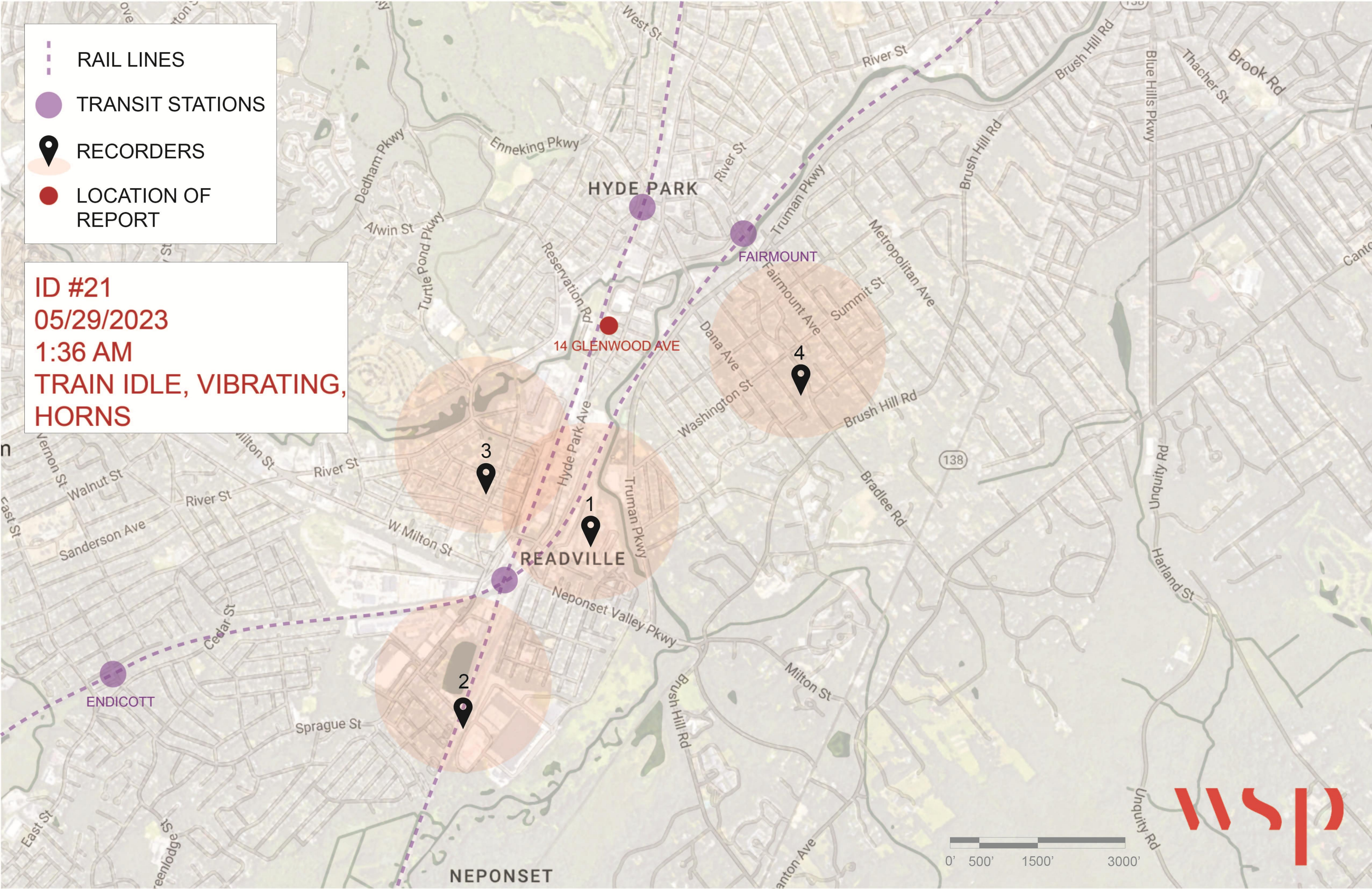
-  RAIL LINES
-  TRANSIT STATIONS
-  RECORDERS
-  LOCATION OF REPORT

ID #20
05/28/2023
1 AM - 6 AM
TRAIN IDLE, LOW HUM,
VIBRATING



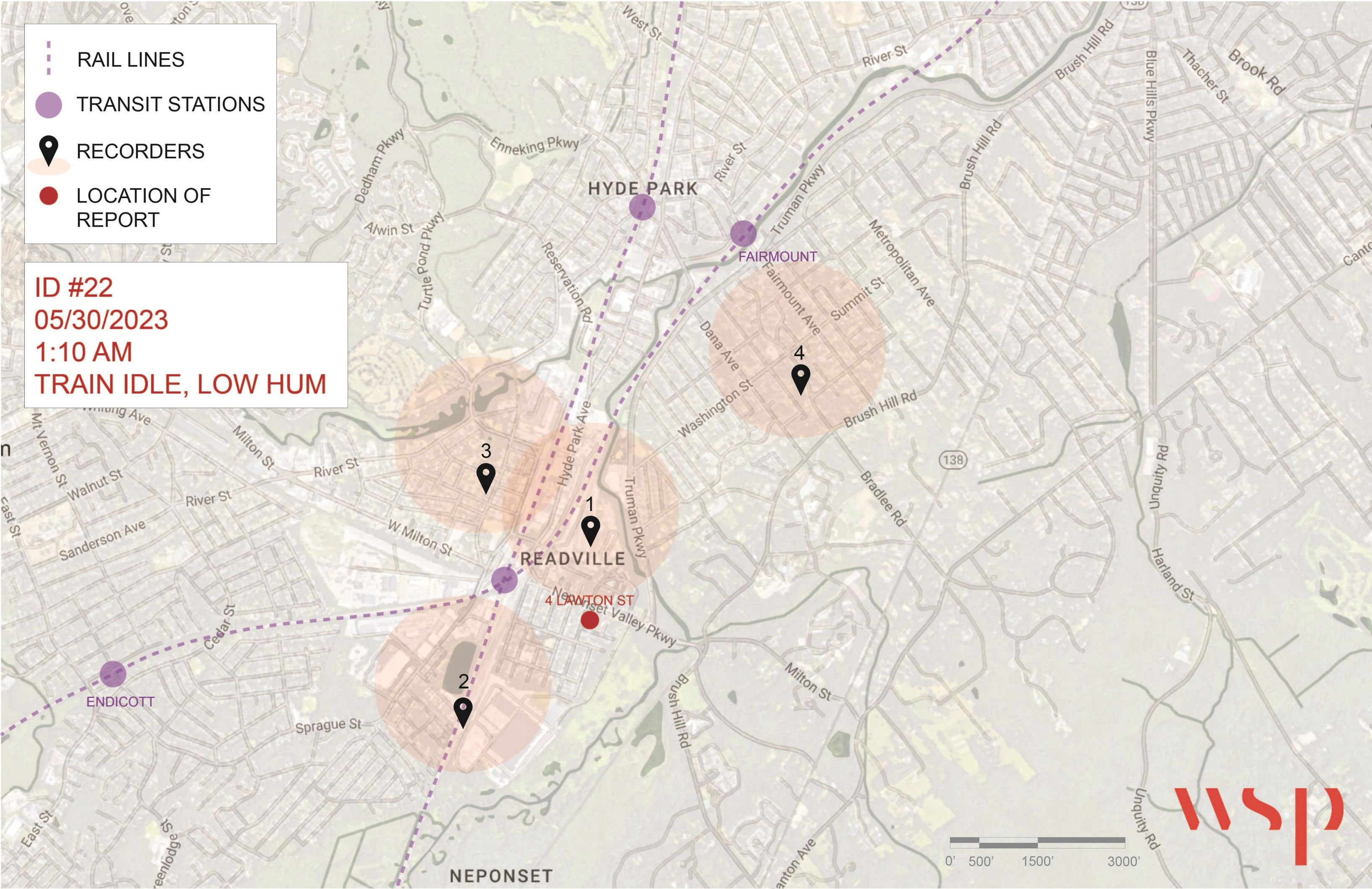
-  RAIL LINES
-  TRANSIT STATIONS
-  RECORDERS
-  LOCATION OF REPORT





ID #21
05/29/2023
1:36 AM
TRAIN IDLE, VIBRATING,
HORNS



- RAIL LINES
- TRANSIT STATIONS
- RECORDERS
- LOCATION OF REPORT

ID #22
05/30/2023
1:10 AM
TRAIN IDLE, LOW HUM



-  RAIL LINES
-  TRANSIT STATIONS
-  RECORDERS
-  LOCATION OF REPORT

ID #23
05/31/2023
12:18 AM
TRAIN IDLE, HORNS

