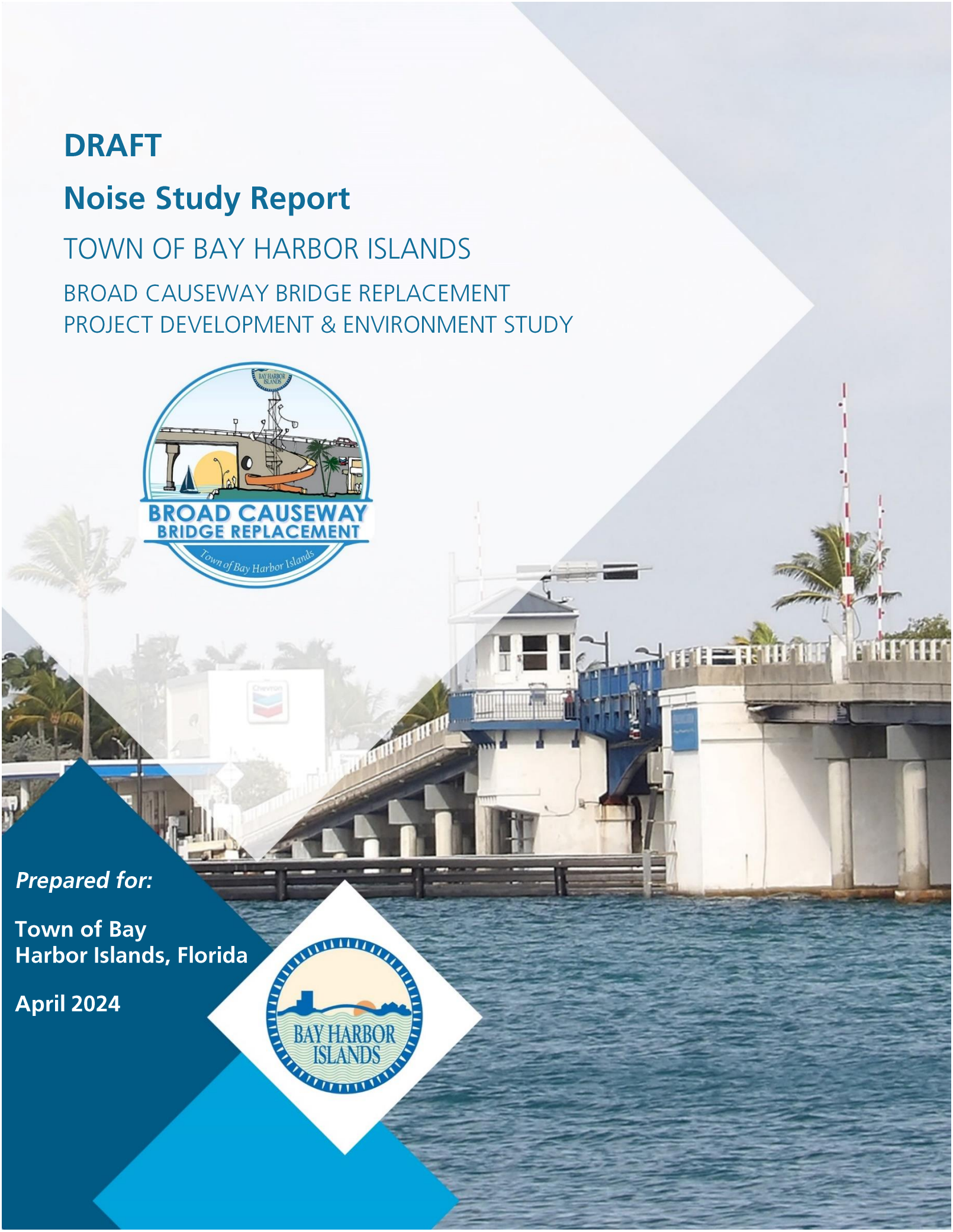
DRAFT

Noise Study Report

TOWN OF BAY HARBOR ISLANDS

BROAD CAUSEWAY BRIDGE REPLACEMENT
PROJECT DEVELOPMENT & ENVIRONMENT STUDY



Prepared for:

Town of Bay Harbor Islands, Florida

April 2024

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DRAFT
Broad Causeway Bridge Replacement
Noise Study Report

April 2024

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being or have been carried out by Florida Department of Transportation (FDOT) pursuant to 23 U.S.C. §327 and a Memorandum of Understanding dated May 26, 2022, and executed by Federal Highway Administration (FHWA) and FDOT.

Prepared for:
Town of Bay Harbor Islands

Prepared by:
AtkinsRéalis

EXECUTIVE SUMMARY

The project involves the potential replacement of the Broad Causeway Bridge connecting the Town of Bay Harbor Islands (Town) with the City of North Miami, within Miami-Dade County. The bridge is part of Broad Causeway, a roadway classified as "Urban Minor Arterial". This arterial also begins in Bal Harbour/Surfside and connects those commuters to the mainland. The specific limits of the project extend from the Broad Causeway Island (25°53'19.41"N, 80° 8'54.52"W) on the west side and (25°53'11.30"N, 80° 8'18.93"W) to east of West Broadview Drive. The Florida Department of Transportation (FDOT) Bridge Identification (ID) Number (No.) is 875101. The project is approximately 0.77 mile in length.

In order to assess highway traffic noise levels associated with the project, this highway traffic noise study was completed in accordance with Title 23, Code of Federal Regulations, Part 772 (23 CFR 772), Procedures for Abatement of Highway Traffic Noise and Construction Noise following methodology and procedures established by the FDOT in the PD&E Manual, Part 2, Chapter 18, Highway Traffic Noise (July 2023), and the FDOT Traffic Noise Modeling and Analysis Practitioners Handbook (December 2018).

Noise levels were predicted at 390 receptor points representing 399 residences and 8 special land uses (i.e., non-residential land uses). For the year 2050 Build condition, noise levels are predicted to approach, meet, or exceed the Noise Abatement Criteria (NAC) at 30 residences and one special land use within the project limits. These impacted noise sensitive sites were evaluated to determine the feasibility and cost reasonableness of providing barriers to reduce traffic noise. Additionally, a substantial increase of 15 dB(A) is not predicted to occur at any residence or special land use (shown in **Appendix C**).

The noise barrier evaluation identified that noise barriers are not a reasonable and feasible form of abatement due to openings in the noise barrier to accommodate access requirements for driveways to residential parcels along Kane Concourse. Therefore, noise barriers are not recommended as part of this project**.**

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

A		
B		
C	**CFR**	Code of Federal Regulations
D	**dB**	Decibels
	dB(A)	A-weighted Decibels
	DPK	Date of Public Knowledge
E		
F	**FDOT**	Florida Department of Transportation
	FHWA	Federal Highway Administration
	Ft	Feet
G		
H		
I		
J		
K		
L	**LOS**	Level of Service
M	**MLW**	Mean Low Water
	MHW	Mean High Water
N	**NAC**	Noise Abatement Criteria
	NEPA	National Environmental Policy Act
	NRDG	Noise Reduction Design Goal
	NSA	Noise Study Area
	NSR	Noise Study Report
	NSS	Noise Sensitive Site(s)
O		
P	**PD&E**	Project Development and Environment
Q		
R	**ROW**	Right-of-Way

S	**SLU**	Special Land Use
	SR	State Road
T	**TNM**	Traffic Noise Model
U	**USCG**	United states Coast Guard
V		
W		
X		
Y		
Z		

1.0 PROJECT SUMMARY

1.1 Project Description

The project involves the potential replacement of the Broad Causeway Bridge connecting the Town of Bay Harbor Islands (Town) with the City of North Miami, within Miami-Dade County. The bridge is part of the Broad Causeway, a roadway classified as "Urban Minor Arterial". This arterial also begins in Bal Harbour/Surfside and connects those commuters to the mainland. The specific limits of the project extend from the Broad Causeway Island (25°53'19.41"N, 80° 8'54.52"W) on the west side and (25°53'11.30"N, 80° 8'18.93"W) to east of West Broadview Drive. The improvements include the bridge approaches and Broad Causeway Island circulation. The Florida Department of Transportation (FDOT) Bridge Identification (ID) Number (No.) is 875101. A graphic depicting the location of the bridge is provided as **Figure 1-1**. The project is approximately 0.77 mile in length.

The existing bridge consists of four lanes, undivided (two in each direction), the four travel lanes are 10 ft. wide, without a raised median. The outside travel lanes also include shared-use markings to accommodate bicycles. In addition, pedestrians use a raised maintenance area on each side of the bridge, with a width that varies from 22 to 36 inches. There are no guardrails separating the sidewalk from the travel lane. Crossing over the Intracoastal Waterway (ICWW), the bridge has a horizontal clearance of 79.7 ft., a maximum vertical clearance of 18.0 ft. at Mean Low Water (MLW) and a minimum vertical clearance of 15.7 ft. at Mean High Water (MHW) at the Bascule crossing. The ICWW at the bridge crossings is deemed a navigable waterway by the United States Coast Guard (USCG). The bridge bascule is required by the USCG to open twice per hour on the quarter and three-quarter hour but only opens if vessels are waiting.

The existing bridge, constructed in 1951, has been determined to be functionally obsolete with fracture critical components based on a Bridge Inspection Report prepared in January 2023 and determined to be structurally deficient based on a Bridge Inspection Report prepared in January 2024 by FDOT. In 2017, major structural repairs were performed to the bridge at a construction cost of approximately $17 million. As a result of a 2020 inspection carried out by FDOT, a design to address additional repairs has been completed and it has been determined that the cost to perform these repairs will amount to $3.0 million. As a result of the 2024 inspection, temporary emergency repairs will be completed. One lane of the bridge is closed until repairs are complete. It is expected that major costly repairs will be needed more frequently as the bridge ages to prevent closure or severe damages. Because of the structure type, the number of structural deficiencies, and high maintenance costs, the Town is considering replacement of the bridge.

This Project Development and Environment (PD&E) Study has been conducted to address the structural and functional deficiencies of the existing Broad Causeway Bridge and to evaluate and compare the feasibility of continued rehabilitation and repair versus replacement of the bridge.

Bridge concepts will include provisions for new pedestrian and bicycle accommodations to comply with Americans with Disabilities Act (ADA) requirements and guardrails for the safety of pedestrians.

Existing right-of way (ROW), owned by the Town, is anticipated to accommodate the replacement bridge and approaches. Included in the Town Charter by the 1953 Senate Bill No. 865, the State of Florida surrendered and granted to the Town any claim or control over all tidewaters and other lands, and all bayous and bay bottoms, beaches, waters, waterways and water bottoms, and all riparian rights within and adjacent to the Town limits for municipal purposes only, a strip of 300 ft. wide from Kane Concourse, westwardly across Biscayne Bay to approximately 123rd Street in the City of North Miami. This 300-ft. wide strip is shown in **Figure 1-2** as a bright yellow highlight. Therefore, the replacement bridge will be built within the 300 ft. strip over Biscayne Bay under claim or control by the Town.

Figure 1-1 Project Location Map

Figure 1-2 Depiction of 300-ft. wide strip from Kane Concourse to North Miami

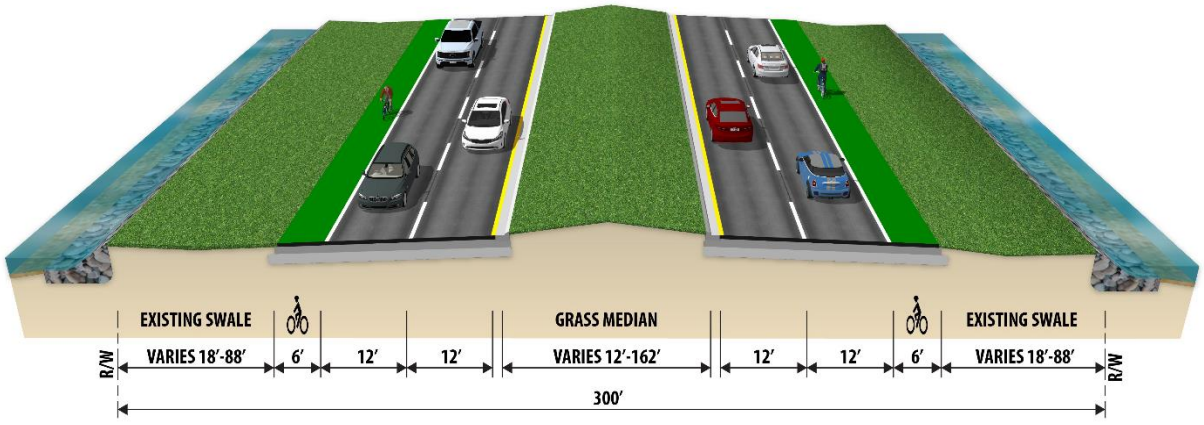
1.2 Purpose and Need

The purpose of this project is to address the structural and functional deficiencies of the existing Broad Causeway Bridge. The need for the project is to improve bridge deficiencies because the 73-year-old bridge is structurally deficient, functionally obsolete, and contains fracture critical components; improve safety since there have been several vehicular crashes in the project corridor, many involving bicycles and pedestrians that resulted in injuries; improve flow of traffic along the project corridor which has high traffic volumes and frequent bridge openings; and to maintain emergency evacuation.

1.3 Existing Conditions

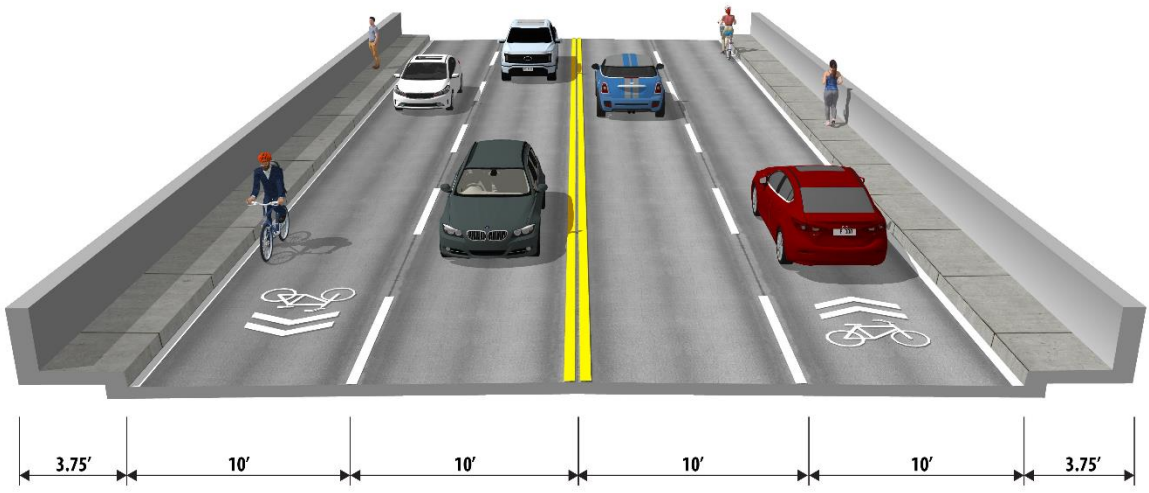
There are three existing typical sections within the project limits. The first typical is the existing roadway on the man-made causeway island from Sta. 105+21.37 to Sta. 123+85.28. The typical includes four, 12 ft. travel lanes and 6 ft. shoulders/bike lanes in both directions and no sidewalks. There is a grassed median that varies in width and inside curbs of 2 ft. On the outside of the shoulder there are grassed swales that vary in width and tie to an existing seawall/rip rap. The entire typical fits within the existing ROW owned by the Town (**Figure 1-3**).

Figure 1-3 Existing Roadway Typical Section – Causeway Island



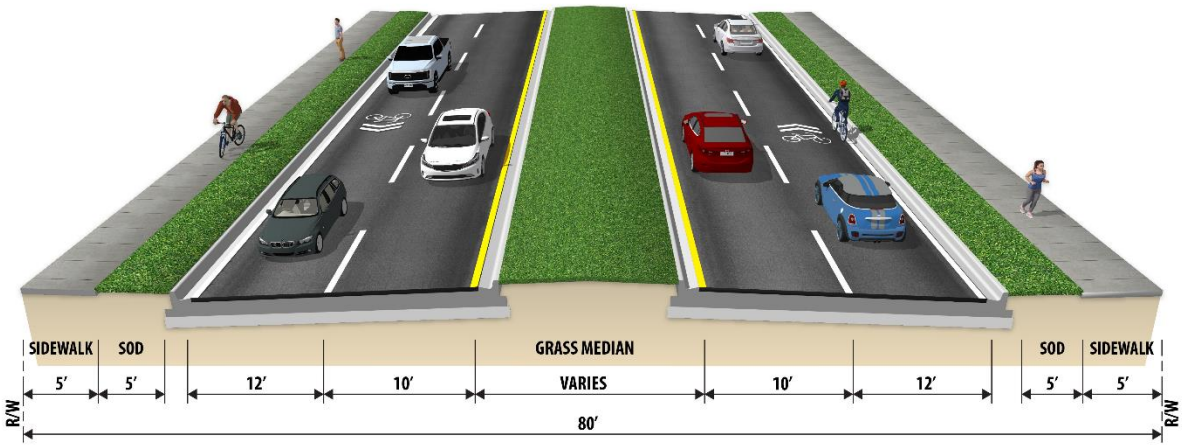
The second typical is the existing bridge with four 10 ft. travel lanes, no shoulders, and a raised 3.75 ft. maintenance section that includes 22 to 36 inches of walkable area and an outside barrier wall. This maintenance section is used as a path for pedestrians and includes a bridge railing. The outside lanes of the existing bridge typical are striped as sharrows for bicycle use (**Figure 1-4**).

Figure 1-4 Existing Bridge Typical Section



The third typical is the approach roadway on the eastern end of the existing bridge on SR 922/Kane Concourse from Sta. 141+41.25 to Sta. 146+25.69 and consists of four travel lanes with widths of 10 ft. (inside) and 12 ft. (outside). The typical also includes a landscaped median varying in width and two 2 ft. curbs on both its sides. On the outside are 2 ft. curbs with 5 ft. sidewalks and 5 ft. of existing sod on each side. The outside lanes are striped as sharrows for bicycle use (**Figure 1-5**).

Figure 1-5 Existing Roadway Typical Section – SR 922/Kane Concourse



2.0 PROJECT ALTERNATIVES

The objective of the alternative analysis process is to identify technically and environmentally sound alternatives that safely accommodate the design year 2030 traffic projections, that are acceptable to the community, and that are cost effective. The process will result in the selection of a Preferred Alternative which can be advanced to the design phase. This section summarizes the viable alternatives evaluated in the PD&E Study.

2.1 No-Build (Rehabilitation) Alternative

The No-Build Alternative is the continued normal maintenance and repair of the existing bridge in its existing configuration to keep the bridge operating in a safe condition, maintaining the existing typical sections. This alternative includes repairing the concrete (sealing cracks, patching spalls, etc.), installing cathodic protection pile jackets (structural and non-structural), repairing the fender system, and repairing the bascule span steel in order to extend the service life 10 years. The No-Build Alternative does not require closure of the bridge to make the repairs. At the end of the 10-year period, a rehabilitation or replacement of the bridge would be required.

The No-Build Alternative does not require stormwater management facilities (SMF), since it does not alter the existing roadway or add capacity. The existing bridge will remain in its existing configuration and no additional travel lanes are proposed.

2.2 Proposed Bridge Replacement Alternatives

The proposed build alternatives include two 11-foot divided travel lanes and an 8-foot shoulder. On the north side of the bridge there will be a 14-foot shared-use path separated from the roadway by a barrier wall for safety. The new alignment will be located to the south of the existing bridge, allowing for traffic to be maintained along the existing bridge while the proposed bridge is constructed. Demolition of the existing bridge would be phased, so that traffic would be maintained within the existing corridor for most of the construction duration and progressively transferred from the existing bridge to the new bridge. (The proposed bridge alternatives are shown in **Figure 2-1**and **Figure 2-2**). This noise analysis evaluated Alternative 2 – High-level bridge.

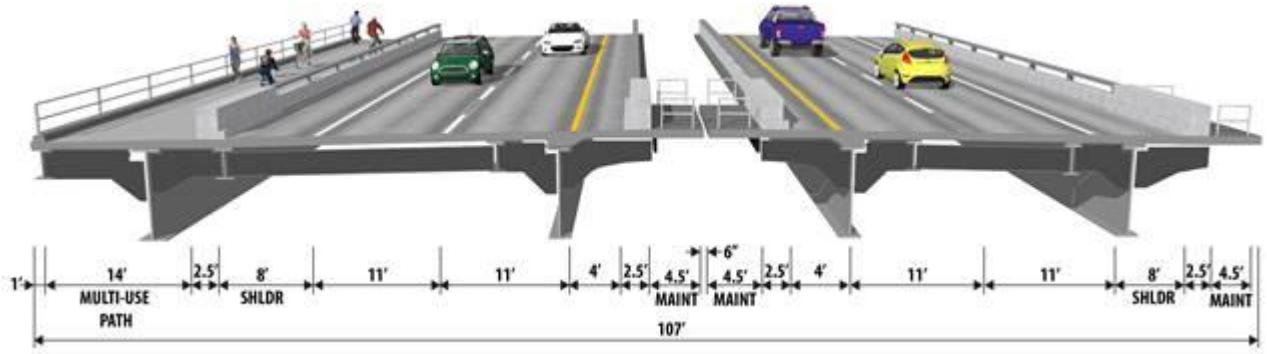
1.1.1 Mid-Level Movable Bridge (40 ft.) Alternative

The Mid-Level Movable Bridge Alternative would replace the existing bridge on the southern alignment and meet all governing design standards and regulations. The new bridge would include adequate lane widths and shoulders, bike lanes, and a shared use path. This alternative would replace the existing bridge with a movable bridge with a navigation clearance of 40 ft. Based on data provided by the existing bridge tender house and allowing for tidal fluctuations, this height would allow approximately 70 to 80 percent of the waterway users that currently require the bridge to open to pass without an opening. The new alignment would be located to the south of the existing bridge, allowing for traffic to be maintained along the existing bridge while the proposed bridge is constructed. Demolition of the existing bridge would be phased, so

that traffic flow would be maintained within the existing corridor for most of the construction duration and progressively be transferred from the existing bridge to the new bridge. Emergency vehicles would have 24/7 access to pass through the corridor and should a hurricane warning be issued, the corridor would still be used as a Hurricane Evacuation Route during construction as it is today. See **Figure 2-1** for the Mid-Level Movable Bridge Alternative.

The Mid-Level Movable Bridge Alternative meets the purpose and need of the project, but would have a higher impact on EFH, seagrasses, and sovereign submerged lands due to the wider bridge footprint. The movable bridge footprint is wider because there are larger bascule piers that enclose the mechanical elements. Also, the bridge requires maintenance walkways to service the movable bridge components. It also has the highest construction cost of $438.1 million. The Mid-Level Movable Bridge Alternative advanced for further detailed analysis and public comment.

Figure 2-1 40 ft. Mid-Level Movable Bridge Alternative



1.1.1 High-Level Bridge (65 ft.) Alternative

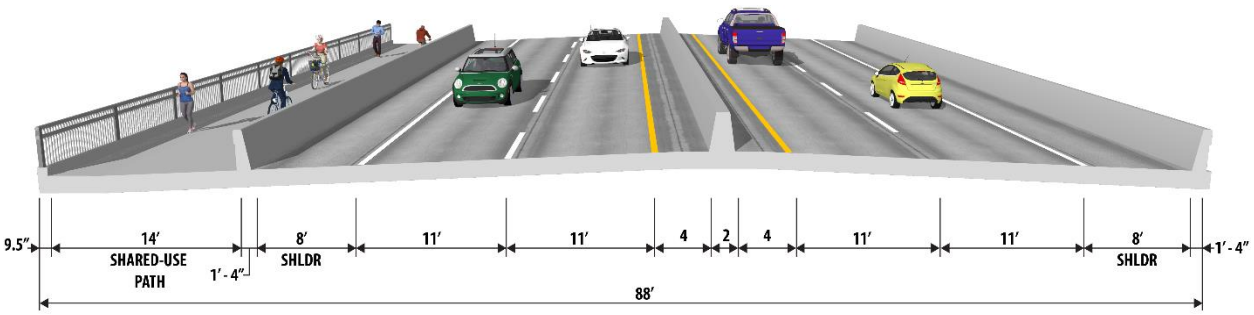
The High-Level Fixed Bridge Alternative would replace the existing bridge and meet all governing design standards and regulations. The new bridge would include adequate lane widths and shoulders, bike lanes, and a shared use path. Based on data provided by the existing bridge tender house and allowing for tidal fluctuations, a fixed structure with a vertical navigational clearance of 65 ft. would allow for most waterway users that currently use the channel to safely navigate under the proposed structure.

The new alignment would be located to the south of the existing bridge, allowing for traffic to be maintained along the existing bridge while the proposed bridge is constructed. Demolition of the existing bridge would be phased, so that traffic would be maintained within the existing corridor for most of the construction duration and progressively be transferred from the existing bridge to the new bridge. Emergency vehicles would have 24/7 access to pass through the corridor and should a hurricane warning be issued, the corridor would still be used as a Hurricane Evacuation

Route during construction as it is today. See **Figure 2-2** for the High-Level Fixed Bridge Alternative.

The High-Level Fixed Bridge Alternative meets the purpose and need of the project but would have a steeper roadway and shared use path slopes and there would be more visual impact to businesses and residents. It has a construction cost of $239.1 million. The High-Level Fixed Bridge Alternative advanced for further detailed analysis and public comment.

Figure 2-2 65 ft. High-Level Fixed Bridge Alternative



3.0 METHODOLOGY

This highway traffic noise study was completed in accordance with Title 23, Code of Federal Regulations, Part 772 (23 CFR 772), *Procedures for Abatement of Highway Traffic Noise and Construction Noise* following methodology and procedures established by the FDOT in the PD&E Manual, Part 2, Chapter 18, *Highway Traffic Noise* (July 2023), and the FDOT *Traffic Noise Modeling and Analysis Practitioners Handbook* (December 2018).

3.1 Noise Metrics

Noise levels developed for this traffic noise study update are expressed in decibels (dB) using an "A"-scale [dB(A)] weighting. This scale most closely approximates the response characteristics of the human ear to typical traffic noise levels. All reported noise levels are hourly equivalent noise levels [Leq(h)]. The Leq(h) is defined as the equivalent steady-state sound level that, in an hourly period, contains the same acoustic energy as the time-varying sound level for the same hourly period. Use of these metrics is consistent with the requirements of 23 CFR 772.

3.2 Traffic Data

FDOT traffic data (volumes and vehicle type percentages) for the existing 2022 were obtained from FDOT's Florida Traffic Online website (https://tdaappsprod.dot.state.fl.us/fto/). No-Build 2050 and Build 2050 traffic data were based on assuming 1% annual growth rate, which was determined after reviewing historical trends and future year model forecasts per methodologies of the FDOT Project Traffic Forecasting Handbook. Traffic data were reviewed to identify forecasted traffic volumes that would yield the highest traffic noise impact. Following requirements of the FDOT's *PD&E Manual* for roadway segments where the predicted hourly design year traffic volumes equal or exceed Level of Service (LOS) C, LOS C hourly traffic should be utilized. For roadway segments where the predicted hourly traffic demand is less than LOS C traffic volumes, the predicted hourly demand volumes should be utilized. Based on the review of the data for the Design year 2050, LOS C volumes for the 2050 No-Build and Build conditions were modeled for Broad Causeway. Demand volumes for the Existing conditions were modeled for Broad Causeway. Traffic data utilized for modeling in this traffic noise study update are highlighted in **Table 3-1**.

The total vehicle volume was divided between five classifications: automobiles, medium trucks, heavy trucks, buses, and motorcycles. The percentages of each vehicle type are listed in **Table 3-1**.

Table 3-1 Broad Causeway Traffic Data

Metric	Existing 2022	No-Build 2050	Build 2050
AADT	24,500	31,900	31,900
LOS C	30,700	30,700	30,700
K-Value	9%	9%	9%
D-Value	56.5	56.5	56.5
Vehicle Percentages (%)			
Automobiles	92.9		
Medium Trucks	3.3		
Heavy Trucks	0.4		
Bus	3.0		
Motorcycles	0.5		

Note: Values subject to rounding.
Source: FDOT Florida Traffic Online https://tdaappsprod.dot.state.fl.us/fto/

3.3 Noise Abatement Criteria

Noise sensitive land uses are properties where there is frequent human use that might be impacted by traffic noise levels that approach, meet, or exceed the NAC – levels established by the FHWA at which abatement must be considered. Typical noise sensitive land uses include residences, schools, churches, commercial properties with outdoor areas of use, and recreational areas. As shown in **Table 3-2**, the NAC vary by activity category. The FDOT criteria are defined as being within one dB(A) of FHWA's NAC to reflect values that "approach" the FHWA criteria. For perspective, **Table 3-3** provides typical noise levels of common indoor and outdoor activities.

Noise abatement measures must also be considered when a substantial increase in traffic noise is predicted to occur as a direct result of a transportation project. FDOT defines a substantial increase as 15 dB(A) or more above existing conditions. A substantial increase typically occurs in areas where traffic noise is a minor component of the existing noise environment but would become a major component after the project is constructed (e.g., new alignment project).

Table 3-2
Noise Abatement Criteria

Activity Category	Activity Leq(h)		Evaluation Location	Description of Land Use Activity Category
	FHWA	FDOT		
A	57	56	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	66	Exterior	Residential.
C	67	66	Exterior	Active sports 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	51	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	71	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A – D or F.
F	------	------	------	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	------	------	------	Undeveloped lands that are not permitted.

Source: FDOT, PD&E Manual Part 2, Figure 18-1.

Table 3-3
Typical Noise Levels

Common Outdoor Activities	Noise Level dB(A)	Common Indoor Activities
	---110---	Rock Band
Jet Fly-over at 1000 ft		
	---100---	
Gas Lawn Mower at 3 ft		
	---90---	
Diesel Truck at 50 ft, at 50 mph		Food Blender at 3 ft
	---80---	Garbage Disposal at 3 ft
Noise Urban Area (Daytime)		
Gas Lawn Mower at 100 ft	---70---	Vacuum Cleaner at 10 ft
Commercial Area		Normal Speech at 3 ft
Heavy Traffic at 300 ft	---60---	
		Large Business Office
Quiet Urban Daytime	---50---	Dishwasher Next Room
Quiet Urban Nighttime	---40---	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime		
	---30---	Library
Quiet Rural Nighttime		Bedroom at Night, Concert Hall (Background)
	---20---	
	---10---	
Lowest Threshold of Human Hearing	---0---	Lowest Threshold of Human Hearing

Source: California Dept. of Transportation Technical Noise Supplement, October 1998, Page 18.

3.4 Noise Abatement Measures

Noise abatement is considered at all Noise Sensitive Sites (NSS) predicted to approach/exceed the NAC as stipulated by 23 CFR 772. Abatement measures considered include traffic management, alignment modifications, noise buffer zones through application of land use controls and noise barriers.

3.4.1 Traffic Management

Traffic management techniques that limit motor vehicle speeds can be used to abate traffic noise. A substantial speed reduction on Broad Causeway would lower traffic noise levels. However, the capacity of the roadway to service traffic would also be reduced. Therefore, speed reduction is not a reasonable abatement measure.

3.4.2 Alignment Modifications

The existing alignment of Broad Causeway dictates the proposed horizontal and vertical alignment. Project costs and detrimental effects on land use are minimized by making use of the existing corridor. An alignment modification that could provide a substantial noise reduction is, therefore, not a feasible or reasonable abatement measure.

3.4.3 Buffer Zones

As properties in the vicinity of a highway are developed, providing a buffer between a highway and future noise sensitive development can minimize or eliminate noise impacts. This abatement measure can be implemented through local land use planning. The distances between the proposed highway and location where traffic noise levels approach the NAC for Activity Categories A, B, C and E are determined to facilitate future land use planning that is compatible with the traffic noise environment. For the proposed conceptual Design, the distance between the nearest through lane of Broad Causeway and the location where traffic noise levels would approach a particular NAC is provided in **Table 3-4**. The distances do not account for any reduction in noise levels that may be provided by berms, privacy walls or intervening structures in the noise propagation path. The noise contours also do not account for any increase in noise resulting from increased highway elevation (e.g., overpasses) or elevated NSS (e.g., second floor patios). For any new development occurring in the future, local officials can use the noise contour information to establish buffer zones thereby minimizing or avoiding noise impacts at sensitive land uses.

Table 3-4
Noise Abatement Criteria Contours

Roadway Segment	Distance[1]		
	Activity Category A [56 dB(A)]	Activity Category B & C [66 dB(A)]	Activity Category E [71 dB(A)]
Broad Causeway	321 ft.	60 ft.	16 ft.

[1]Distance referenced to the edge of the nearest proposed through lane. Distance does not account for any reduction in noise levels that may be provided by berms, privacy walls or intervening structures.

3.4.4 Noise Barriers

Noise barriers reduce noise levels by blocking the sound path between a highway and noise sensitive site. To effectively reduce traffic noise, a barrier must be relatively long, continuous (with no intermittent openings), and of sufficient height. For a noise barrier to be considered feasible and cost reasonable, the following minimum conditions should be met:

Noise barriers must meet several criteria to be considered a viable form of noise abatement such as acoustic requirements, cost criteria, engineering requirements, and more.

- At least two impacted receptors must be provided a noise reduction of 5 dB(A) or more to be considered feasible.
- A noise barrier must also attain the Noise Reduction Design Goal (NRDG), which states that a minimum noise reduction of 7 dB(A) for at least one benefited receptor must be achieved. Of importance, this receptor may also have been previously identified as meeting the feasibility requirement of receiving a 5 dB(A) reduction (first bullet).
- The cost of the noise barriers should not exceed $42,000 per benefited receptor. This is the upper cost limit established by FDOT. A benefited receptor is defined as a recipient of an abatement measure that experiences at least a 5 dB(A) reduction as a result of providing a noise barrier. The current unit cost used to evaluate cost reasonableness is $30 per square foot (sq. ft.).

Within the project limits, noise barrier locations are evaluated as follows:

- Right-of-Way (ROW) noise barriers located outside the clear recovery zone, but within the right-of-way, are initially considered at heights ranging from 8 ft. to 22 ft. in 2-ft. increments. According to the FDOT *Design Manual* (January 2023), noise barriers outside the clear zone shall not exceed a maximum height of 22 ft.
- If a right-of-way barrier cannot provide at least a 5 dB(A) reduction to an impacted receptor or the barrier is not feasible due to construction limitations, then a shoulder barrier is evaluated. According to the FDOT *Design Manual*, shoulder barriers shall not exceed 14 ft. in height when on embankment and 8 ft. in height when on structure.

The length and height of the noise barriers are optimized based on the benefit provided to NSS with predicted noise levels that approach, meet, or exceed the NAC.

3.5 Noise Model

Predicted noise levels were produced using the FHWA's Traffic Noise Model (TNM), version 2.5. This model predicts noise levels at noise sensitive receptor sites as a result of highway traffic. Model-predicted noise levels are influenced by several factors including vehicle speed and types, the distance between the noise source and receptor, the effects of intervening barriers, structures (buildings, barriers, etc.), ground surface type, and topography.

The TNM files used in this analysis can be found in the FDOT Project File and are available upon request.

3.5.1 Noise Model Validation

3.5.1.1 Field Testing Procedure

To validate the accuracy of the computer noise model for the project area, field measurements were taken following procedures documented in FHWA's *Noise Measurement Handbook* (June 2018). All monitoring events were ten minutes in duration consistent with FDOT procedures.

3.5.1.2 Date and Instrumentation

Noise monitoring was performed on January 30-31, 2023 using a Quest SoundPro Sound Level Meter. Prior to taking noise measurements, the noise monitor was calibrated using a 3M AC-300 Calibrator.

3.5.1.3 Field Measurement Locations

Validation was performed at four sites along the project corridor. The validation sites were located along the ROW of the existing highway. Traffic volumes by vehicle classification were noted during each monitoring event. Field notes for each monitoring event are provided in **Appendix A**. Locations of monitoring sites are depicted in aerials provided in **Appendix B**.

3.5.1.4 Model Validation Results

The results for each monitoring event are provided in **Table 3-5**. The variance between measured and predicted noise levels was less than 3 dB(A). Therefore, the noise model is predicting within the level of accuracy specified in FDOT's PD&E Manual, Part 2, Chapter 18.

Table 3-5
Noise Model Validation

Location	Trial #	Date	Start Time	Field Measured Level dB(A)	Computer Predicted Level dB(A)	Decibel Difference dB(A)
Monitoring Site #1 WB Broad Causeway West side of Bridge	1	1/30/23	4:02 PM	67.3	67.2	-0.1
	2		4:15 PM	68.0	67.6	-0.4
	3		4:28 PM	67.4	67.7	0.3
Monitoring Site #2 EB Broad Causeway SW of Gas Station	1	1/31/23	10:50 AM	60.5	62.3	1.8
	2		11:00 AM	60.6	61.7	1.1
	3		11:12 AM	60.1	62.3	2.2
Monitoring Site #3 Broad Causeway Grass Median West of Gas Station	1	1/31/23	11:32 AM	61.5	62.7	1.2
	2		11:44 AM	62.0	61.5	-0.5
	3		11:55 AM	62.4	61.7	-0.7
Monitoring Site #4 Tot Lot	1	1/31/23	12:36 PM	70.8	69.0	-1.8
	2		12:47 PM	70.9	68.2	-2.7
	3		1:07 PM	70.4	69.4	-1.0

3.6 Receptors

Within the project limits, 390 receptors were used to evaluate noise levels at NSS. The noise sensitive land uses along Broad Causeway for which there is a NAC include:

- Activity Category B (residential areas) – 370 receptors representing 399 residences;
- Activity Category C – 16 receptors representing three parks and a school;
- Activity Category D – 1 receptor representing a library; and
- Activity Category E – 3 receptors representing a hotel, a motel and an outside dining area.

The receptors representing NSS are located in accordance with 23 CFR 772, FDOT's PD&E Manual, Part 2, Chapter 18 and the FDOT *Traffic Noise Modeling & Analysis Practitioner's Handbook* as follows:

- Activity Category B and D receptors were located at the edge of the dwellings/buildings that is closest to Broad Causeway.
- Receptor points representing NSS in Activity Category E were located within exterior areas, where frequent human use may occur.
- Ground-floor receptor points were modeled at five feet above the ground elevation. Each additional floor was modeled at an additional 10 ft. For example, second story receptors were modeled at 15 feet, and third story receptors were modeled at 25 ft.

The locations of the receptors are depicted on aerials in **Appendix B**. The alphanumeric identification for each receptor point was formulated as follows:

- Receptor points along the westbound side of Broad Causeway are specified by a "W" in the receptor identification.
- Receptor points along the eastbound side of Broad Causeway are specified by a "E" in the receptor identification.
- The numeric portion of the receptor identification identifies a specific receptor point and generally increase from West to East.

3.6.1 Common Noise Environments

Receptors are assigned a Common Noise Environment (CNE) to group NSS of the same NAC that are geographically near one another and therefore influenced by the same noise sources. Each CNE is discussed separately in this report.

3.7 Special Land Uses

It should be noted that the methodology used to evaluate noise barriers for special land uses (SLU; i.e., non-residential land uses) is different than for residential receptors. Noise barriers for special land use were evaluated following procedures documented in FDOT's *A Method to Determine Reasonableness and Feasibility of Noise Abatement at Special Use Locations* (July 2009). This methodology accounts for the threshold of $42,000 per benefited receptor and translates it to apply to a non-residential receptor based on person-hours-of-use in the following equation:

$$\frac{\$42k}{residence} x \frac{residence}{2.46\ persons} x \frac{usage}{24\ hours} x\ (14ft. x\ 100ft.) = \$995{,}935/\text{person hour/ft}^2$$

The cost of abatement is considered reasonable if the calculated "abatement cost factor" is below the "criteria abatement cost factor" of the above equation ($995,935/person-hour/ft^2).

3.8 Existing Noise Levels

The FHWA's TNM was used to predict existing noise levels for receptors located near roadways and where traffic noise is the dominant source. An individual receptor's existing noise level is listed in **Appendix C**.

3.8.1 Substantial Increase in Noise

An evaluation of substantial increases was performed for this PD&E phase analysis. Each noise sensitive site was assigned an existing noise level based on TNM predicted existing noise levels and is provided in **Appendix C**. As shown in **Appendix C**, substantial increases in traffic noise are not expected as a result of this project.

4.0 TRAFFIC NOISE ANALYSIS RESULTS

Highway traffic noise levels were predicted at 390 receptors representing 399 residences and 8 Special Land Uses (SLU; i.e., non-residential land uses) potentially affected by highway traffic noise. The following section provides the results of the traffic noise analysis, including the identification of impacted NSS and the evaluation of abatement measures.

4.1 Noise Levels, Impact Determination, and Abatement Analysis

4.1.1 Noise Sensitive Sites Along Westbound Lanes (North of Broad Causeway)

Noise levels were predicted for 2050 Build conditions at 182 residences and two special land uses along the westbound lanes of Broad Causeway (north of Broad Causeway). All impacted NSS were evaluated to determine the feasibility and reasonableness of providing barriers to reduce traffic noise. The discussions that follow analyze residential communities and special land uses along the westbound lanes of Broad Causeway from west to east.

4.1.1.1 Residences Northwest of Broad Causeway Bridge

Residences located northwest of Broad Causeway Bridge (**Appendix D**, Aerial Sheet 1) were evaluated using 25 receptors to represent 54 residences. Exterior traffic noise levels are predicted to range from 42.1 to 61.6 dB(A) for the Design year and do not approach, meet or exceed the NAC at any residence. Furthermore, the residences are not expected to have a substantial increase of 15 dB(A) over existing conditions (see **Appendix C**). Therefore, a noise barrier for these residences was not evaluated.

4.1.1.2 White House Inn on the Bay Motel

The White House Inn on the Bay Motel[1] (**Appendix B**, Aerial Sheet 1) is located along westbound Broad Causeway to the west of the bridge. This motel has one exterior area of frequent human use (a community pool). This exterior use area was evaluated as an Activity Category E and is represented by one receptor. For Design Year Build conditions, exterior traffic noise levels are predicted to be 55.1 dB(A) and do not approach, meet, or exceed the NAC at the motel's exterior use area. Furthermore, the facility is not expected to have a substantial increase of 15 dB(A) over existing conditions (see **Appendix C**). Therefore, a noise barrier was not evaluated.

[1] The White House Inn on the Bay Motel appears to be closed. However, the parcel is not listed as vacant on the Miami-Data County Property Appraiser's website. Therefore, to be conservative, the parcel was included as a Noise Sensitive Site. https://gisweb.miamidade.gov/NSPApp/NSPApp.htm

4.1.1.3 Bay Harbor Islands Tot Lot

The Bay Harbor Islands Tot Lot (playground) (**Appendix B**, Aerial Sheet 3) is located along westbound Broad Causeway at the eastern touchdown of the bridge. This playground was evaluated as an Activity Category C and represented by six receptors. For Design Year Build conditions, exterior traffic noise levels are predicted to range from 60.1 to 64.4 dB(A) and do not approach, meet, or exceed the NAC at the playground. Furthermore, the facility is not expected to have a substantial increase of 15 dB(A) over existing conditions (see **Appendix C**). Therefore, a noise barrier was not evaluated.

4.1.1.4 Residences Northeast of Broad Causeway Bridge

Residences northeast of Broad Causeway Bridge (**Appendix B**, Aerial Sheet 3 and 4) are represented by 128 receptor points representing 128 residences. Exterior traffic noise levels are predicted to range from 43.6 to 71.2 dB(A) for the Design year and approaches, meets or exceeds the NAC at 20 residences. Therefore, a noise barrier for these residences was considered.

However, noise barriers were not found to be a reasonable or feasible form of abatement due to openings in the noise barrier which to accommodate driveway access requirements. Additionally, height limitations along the canal prevented the noise barrier from providing any noise reduction to residences located above ground floors. Therefore, a noise barrier for these residences is not recommended.

4.1.2 Noise Sensitive Sites Along Eastbound Lanes (South of Broad Causeway)

Noise levels were predicted for 2050 Build conditions at 217 residences and six special land uses along the eastbound lanes (south of Broad Causeway). All impacted NSS were evaluated to determine the feasibility and reasonableness of providing barriers to reduce traffic noise. The discussions that follow analyze residential communities and special land uses along the eastbound lanes of Broad Causeway from west to east.

4.1.2.1 Residences Southwest of Broad Causeway Bridge

Residences located southwest of Broad Causeway Bridge (**Appendix B**, Aerial Sheet 2) were evaluated using 125 receptors to represent 125 residences. Exterior traffic noise levels are predicted to range from 32.9 to 54.3 dB(A) for the Design year and do not approach, meet or exceed the NAC at any residence. Furthermore, the residences are not expected to have a substantial increase of 15 dB(A) over existing conditions (see **Appendix C**). Therefore, a noise barrier for these residences was not evaluated.

4.1.2.2 North Bayshore Park

North Bayshore Park (**Appendix B**, Aerial Sheet 2) is located along the eastbound lanes of Broad Causeway and to the west of the Bridge. This park was evaluated as an Activity Category C and was represented by eight receptors. For Design Year Build conditions, exterior traffic noise levels are predicted to range from 54.0 to 65.9 dB(A) and do not approach, meet, or exceed the NAC at the park. Furthermore, the facility is not expected to have a substantial increase of 15 dB(A) over existing conditions (see **Appendix C**). Therefore, a noise barrier was not evaluated.

4.1.2.3 Residences Southeast of Broad Causeway Bridge

Residences located southeast of Broad Causeway Bridge (**Appendix B**, Aerial Sheet 3 and 4) are represented by 92 receptor points representing 92 residences. Exterior traffic noise levels are predicted to range from 48.7 to 71.9 dB(A) for the Design year and approaches, meets or exceeds the NAC at ten residences. Therefore, a noise barrier for these residences was considered.

However, noise barriers were not found to be a reasonable or feasible form of abatement due to openings in the noise barrier which are required to accommodate driveway access. Therefore, a noise barrier for these residences is not recommended.

4.1.2.4 The Altair Bay Harbor Hotel

The Altair Bay Harbor Hotel (**Appendix B**, Aerial Sheet 4) is located along eastbound Broad Causeway. This hotel has one exterior area of frequent human use (a community pool). This exterior use area was evaluated as an Activity Category E and was represented by one receptor. For Design Year Build conditions, exterior traffic noise levels are predicted to be 67.1 dB(A) and do not approach, meet, or exceed the NAC at the hotels' exterior area of frequent human use. Furthermore, the facility is not expected to have a substantial increase of 15 dB(A) over existing conditions (see **Appendix C**). Therefore, a noise barrier was not evaluated.

4.1.2.5 95th Street Park in Bay Harbor Islands

The 95th Street Park in Bay Harbor Islands (**Appendix B**, Aerial Sheet 4) is located along eastbound Broad Causeway. This park was evaluated as an Activity Category C and was represented by one receptor. For Design Year Build conditions, exterior traffic noise levels are predicted to be 56.9 dB(A) and do not approach, meet, or exceed the NAC at the park. Furthermore, the facility is not expected to have a substantial increase of 15 dB(A) over existing conditions (see **Appendix C**). Therefore, a noise barrier was not evaluated.

4.1.2.6 Ruth K. Broad Bay Harbor K-8 Center

The Ruth K. Broad Bay Harbor K-8 Center (**Appendix B**, Aerial Sheet 4) is located eastbound Broad Causeway. This school has several exterior areas of frequent human use which were evaluated as

an Activity Category C and were represented by one receptor. For Design Year Build conditions, exterior traffic noise levels are predicted to be 45.2 dB(A) and do not approach, meet, or exceed the NAC at the school's exterior use areas. Furthermore, the facility is not expected to have a substantial increase of 15 dB(A) over existing conditions (see **Appendix C**). Therefore, a noise barrier was not evaluated.

4.1.2.7 Bay Harbor Islands Branch Library

The Bay Harbor Islands Branch Library (**Appendix B**, Aerial Sheet 4) is located along eastbound Broad Causeway. This library has no exterior areas of frequent human use and was therefore evaluated as an Activity Category D. The library was represented by one receptor. Including a 20 dB(A) insertion loss provided by the building, interior Design Year Build conditions are predicted to be 32.8 dB(A) and do not approach, meet, or exceed the NAC at the library. Furthermore, the facility is not expected to have a substantial increase of 15 dB(A) over existing conditions (see **Appendix C**). Therefore, a noise barrier was not evaluated.

4.1.2.8 Coffee Break

Coffee Break (**Appendix B**, Aerial Sheet 4) is a café located along eastbound Broad Causeway. This cafe has an exterior dining area. This exterior use area was evaluated as an Activity Category E and was represented by one receptor. For Design Year Build conditions, exterior traffic noise levels are predicted to be 72.5 dB(A) and approach, meet, or exceed the NAC at café's exterior dining area. Furthermore, the facility is not expected to have a substantial increase of 15 dB(A) over existing conditions (see **Appendix C**). Therefore, a noise barrier was evaluated further.

However, a noise barrier was not found to be a reasonable or feasible form of abatement due to openings in the noise barrier to accommodate access requirements. Therefore, a noise barrier for these residences is not recommended.

5.0 CONCLUSIONS

5.1 Impacted Noise Sensitive Sites

Noise levels were predicted at 390 receptor points representing 399 residences and 8 special land uses. For the year 2050 Build condition, noise levels are predicted to approach, meet, or exceed the NAC at 30 residences and one special land use within the project limits. These impacted noise sensitive sites were evaluated to determine the feasibility and cost reasonableness of providing barriers to reduce traffic noise. Additionally, a substantial increase of 15 dB(A) is not predicted to occur at any residence or special land use (shown in **Appendix C**).

5.2 Recommended Noise Barriers

The noise barrier evaluation identified that noise barriers are not a reasonable and feasible form of abatement due to openings in the noise barrier to accommodate access requirements for driveways to residential parcels along Kane Concourse. Therefore, noise barriers are not recommended as part of this project**.**

5.3 Statement of Likelihood

Based on the noise analyses performed to date, there are no feasible solutions available to mitigate the noise impacts at the locations identified in **Section 4.1**. Noise levels will be reassessed during the Design phase of this project.

6.0 CONSTRUCTION NOISE AND VIBRATION

Based on the existing land use within the limits of this project, construction of the proposed roadway improvements may have any noise or vibration impact. If noise-sensitive land uses develop adjacent to the roadway prior to construction, additional impacts could result.

The use of a vibratory hammer will occur during daytime hours only. It is anticipated that the application of the FDOT *Standard Specifications for Road and Bridge Construction* will minimize or eliminate most of the potential construction noise and vibration impacts. However, should unanticipated noise or vibration issues arise during the construction process, the Project Manager, in concert with the FDOT Noise Specialist (as applicable) and the Contractor, will investigate additional methods of controlling these impacts.

7.0 COMMUNITY COORDINATION

Coordination with local agencies, officials and the general public is ongoing. The public has had the opportunity to comment on the proposed project at public meetings and other outreach efforts. The following outreach efforts have occurred:

- Alternatives Public Workshop (in-person)
  - September 26, 2023 from 7-8:30 pm
  - Morris N. Broad Community Center, 1175 95th St, Bay Harbor Islands, FL 33154
  - Public comments: No noise-related comments received.
- Alternatives Public Workshop (virtual)
  - September 28, 2023 from 6-8:00 pm
  - Zoom Meeting
  - Public comments: No noise-related comments received.

A copy of the final NSR will be circulated to the appropriate local planning/zoning officials for their use upon approval of the Environmental Document. Planning/zoning officials should reference **Table 3-4** in **Section 3.4.3** to plan appropriate noise buffer zones.

8.0 REFERENCES

23 CFR Part 772, "Procedures for Abatement of Highway Traffic Noise and Construction Noise", Federal Register, Vol. 75, No. 133, Tuesday, July 13, 2010; pages 39834-39839.

Florida Department of Transportation, "A Method to Determine Reasonableness and Feasibility of Noise Abatement at Special Use Locations", July 2009. 64 pages.

Florida Department of Transportation. "Highway Traffic Noise", Part 2, Chapter 18. Project Development and Environment Manual, Florida Department of Transportation, Tallahassee, July 1, 2023.

Florida Department of Transportation Design Manual Volume 1, Chapter 264, "Noise Walls and Perimeter Walls", January 2023.

Florida Department of Transportation "Standard Specifications for Road and Bridge Construction", January 2023.

Florida Department of Transportation, "2012 FDOT Quality/Level of Service Handbook"; Tallahassee, Florida; 2012.

Federal Highway Administration Report FHWA-HEP-10-025, "Highway Traffic Noise: Analysis and Abatement Guidance", June 2010 (revised December 2010); 76 pages.

Federal Highway Administration Report FHWA-PD-96-009, "FHWA Traffic Noise Model, Version 1.0 User's Guide", January 1998; 192 pages + supplements.

Federal Highway Administration Report Number FHWA-PD-96-046, "Measurement of Highway-Related Noise", Cynthia S.Y. Lee and Gregg Fleming; May 1996; 206 pages.

Federal Highway Administration Report FHWA-HEP-06-015, "FHWA Highway Construction Noise Handbook: Final Report". August 2006; 185 pages.

Federal Highway Administration. "Consideration of Existing Noise Barrier in a Type I Noise Analysis FHWA-HEP-12-051." https://www.fhwa.dot.gov/ENVIRONMENT/noise/noise_barriers/abatement/existing.cfm

APPENDICES

APPENDIX A – Model Validation Field Sheet

APPENDIX B – Project Aerials

APPENDIX C – Predicted Noise Levels

APPENDIX A: Model Validation Field Sheets

TRAFFIC SOUND LEVEL DATA FOR VALIDATION OF NOISE MODEL

Date: 1/30/23 Wind: 3-5mph

Project: Broad Causeway Temperature: 81°F

Humidity: 58%

Location #1: Broad Causeway WB on west side of Bridge

repitition # and start time	roadway direction	cars	medium trucks	heavy trucks	speed	sound level	
4:02 pm	EB	131	0	0	30-35	67.3	1 motorcycle
	WB	195	3	1	30-35		1 motorcycle
4:15 pm	EB	101	2	0	30-35	68.0	1M 3Bus
	WB	166	5	2	30-35		2M 2Bus
4:28 pm	EB	130	1	0	30-35	67.4	1M 2B
	WB	222	0	0	30-35		3M 3B

Location #2: ~~Broad Causeway SB on west side of bridge~~

Notes:

P:Noise and Air|Techtask Noise\Forms|validform.xls

TRAFFIC SOUND LEVEL DATA FOR VALIDATION OF NOISE MODEL

Date: 1/31/23

Wind: 7-8mph

Project: Broad causeway

Temperature: 82°F

Humidity: 63%

Location #1: Broad causeway EB Traffic side SW of gas station

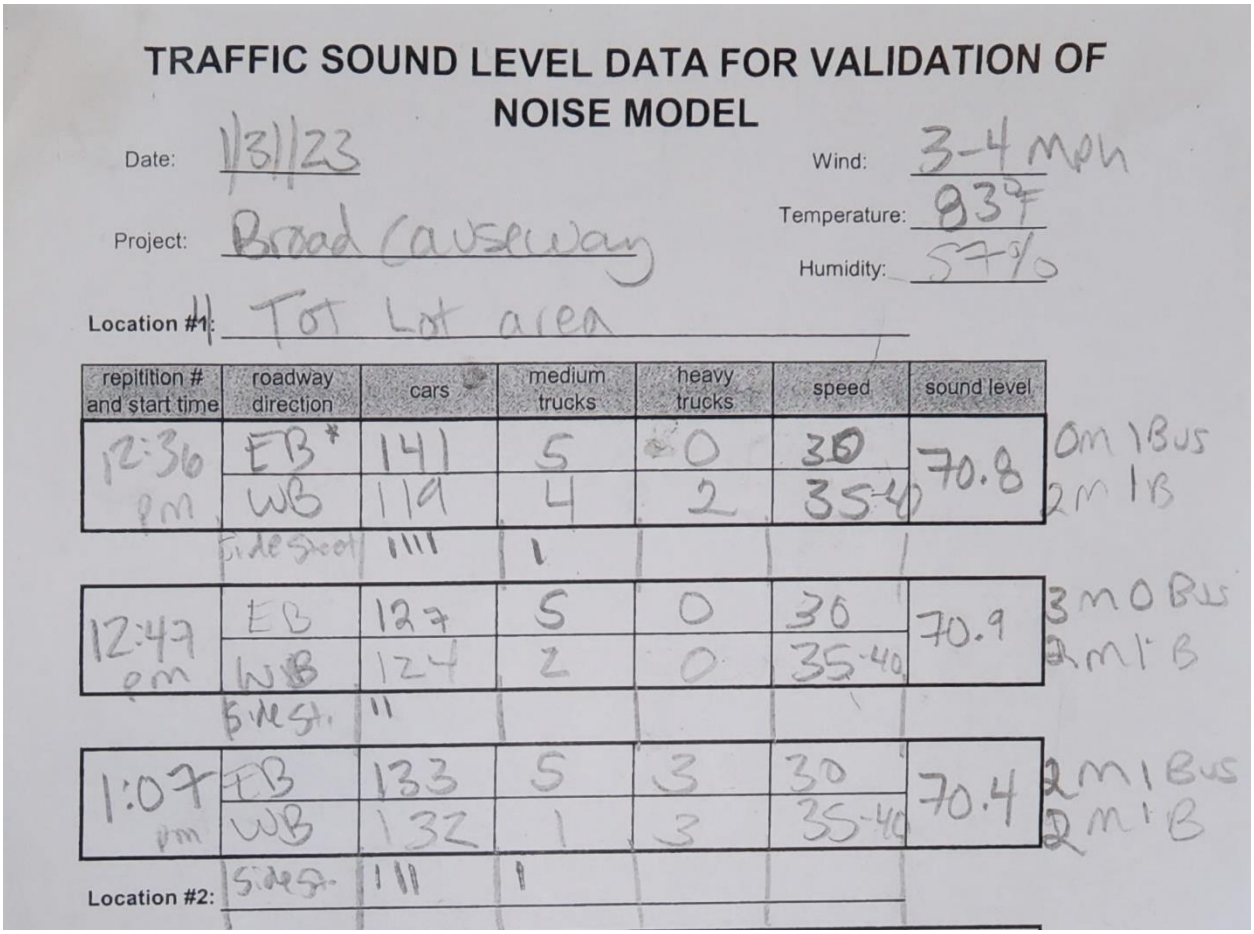
repitition # and start time	roadway direction	cars	medium trucks	heavy trucks	speed	sound level	
10:50 AM	EB	126	12	0	30-35	60.5	1mOB 2m OBUS
	WB	119	5	1	30-35		
11:00 AM	EB	119	6	0	30-35	60.6	2m IBU 1m IBUS
	WB	98	4	3	30-35		
11:12 AM	EB	126	9	1	30-35	60.1	2m OB 0m OBUS
	WB	104	8	1	30-35		

Location #2: Broad Causeway - median west of gas station

11:32 AM	EB	97	8	2	30-35	61.5	1m IB 0m OB
	WB	109	8	0	30-35		
11:44 AM	EB	101	1	0	30-35	62.0	1m OB 1m IB
	WB	136	6	1	30-35		
11:55 AM	EB	110	1	0	30-35	62.4	2m IB 1m OB
	WB	135	6	1	30-35		

Notes:

P:Noise and Air|Techtask Noise\Forms|validform.xls



TRAFFIC SOUND LEVEL DATA FOR VALIDATION OF NOISE MODEL

Date: 1/31/23

Wind: 3-4 mph

Temperature: 83°F

Project: Broad Causeway

Humidity: 57%

Location #1: Tot Lot area

repitition # and start time	roadway direction	cars	medium trucks	heavy trucks	speed	sound level	
12:36 pm	EB*	141	5	0	30	70.8	0m 1Bus 2m 1B
	WB	119	4	2	35-40		
	Side Street	IIII	1				
12:47 pm	EB	127	5	0	30	70.9	3m 0Bus 2m 1B
	WB	124	2	0	35-40		
	Side St.	II					
1:07 pm	EB	133	5	3	30	70.4	2m 1Bus 2m 1B
	WB	132	1	3	35-40		
Location #2:	Side St.	III	1				

APPENDIX B: Project Aerials


W19
W18
W17
W15
W11
W14
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W7
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W13
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W12
W16
W5
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W24
W22
W23
W21
W4
W1
W2
W3
Bayshore Dr.
Keystone Manor Condo
White House Inn on the Bay Motel
NE 123rd St.
Broad Causeway
E13
E14
E19
E28
E10
E30
E8
E32
E7
E41
E128
E127
E126
E131
E133
E132
North Bayshore Park
E3
E6
E12
E31
E90-E93
E106-E109
E1
E4
E9
E29
E122-E125
E130
E118-E121
E129
E74-E77
E98-E101
E94-E97
E114-E117
E110-E113
E102-E105
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Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
Legend
Noise Sensitive Sites
Height (ft.)
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NAC
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Validation Sites
Broad Causeway Bridge Replacement
Town of Bay Harbor Island
Noise Study Evaluation
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Feet
1 inch = 200 feet
Sheet 1
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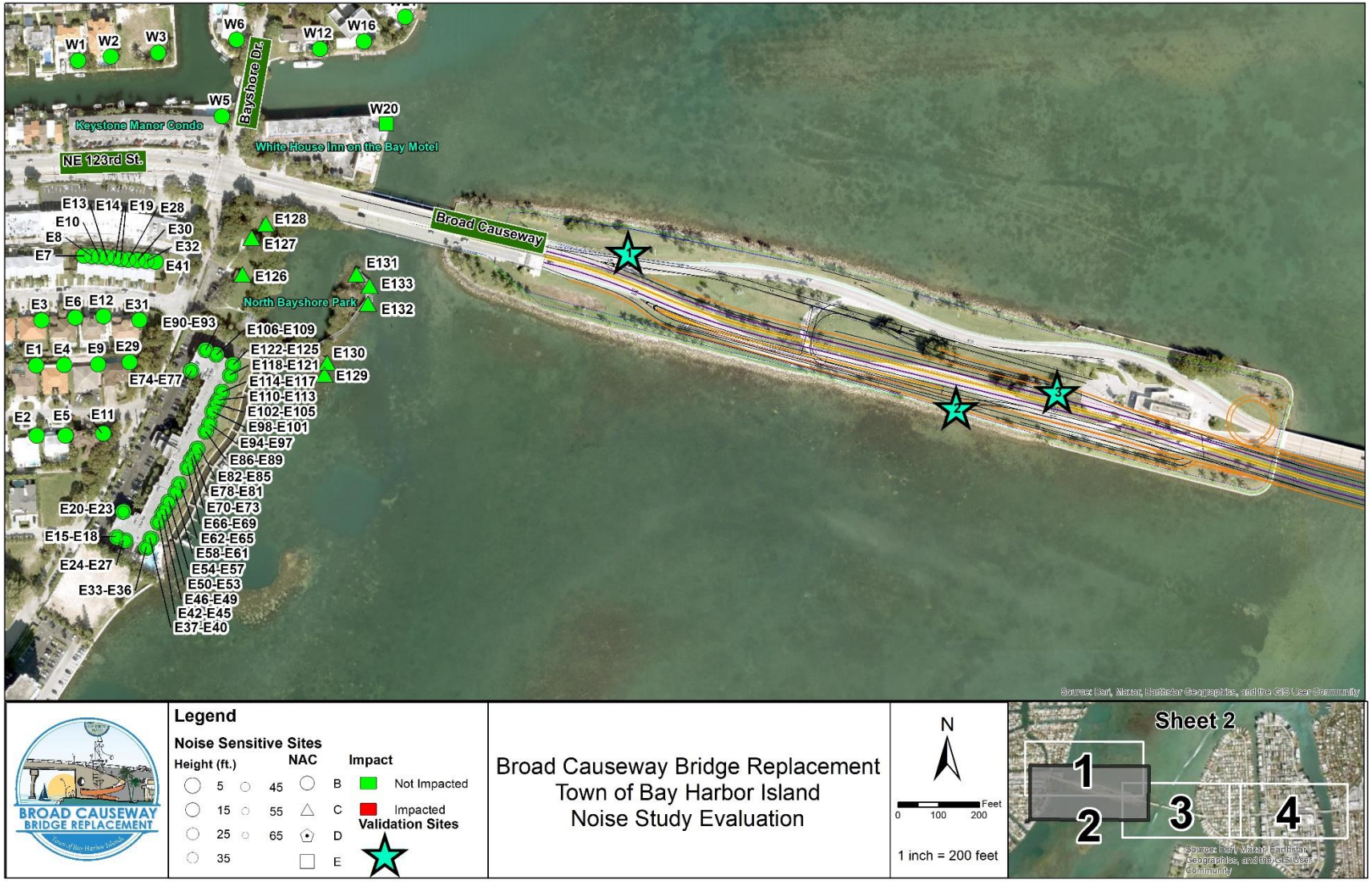
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community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Bayshore Dr.
Keystone Manor Condo
White House Inn on the Bay Motel
NE 123rd St.
Broad Causeway
North Bayshore Park
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E90-E93
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E130
E118-E121
E74-E77
E114-E117
E129
E110-E113
E2
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E11
E102-E105
E98-E101
E94-E97
E86-E89
E82-E85
E78-E81
E20-E23
E70-E73
E66-E69
E15-E18
E62-E65
E58-E61
E24-E27
E54-E57
E50-E53
E33-E36
E46-E49
E42-E45
E37-E40
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
BROAD CAUSEWAY BRIDGE REPLACEMENT
Legend
Noise Sensitive Sites
Height (ft.)
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NAC
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Impact
Not Impacted
Impacted
Validation Sites
Broad Causeway Bridge Replacement
Town of Bay Harbor Island
Noise Study Evaluation
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Feet
1 inch = 200 feet
Sheet 2
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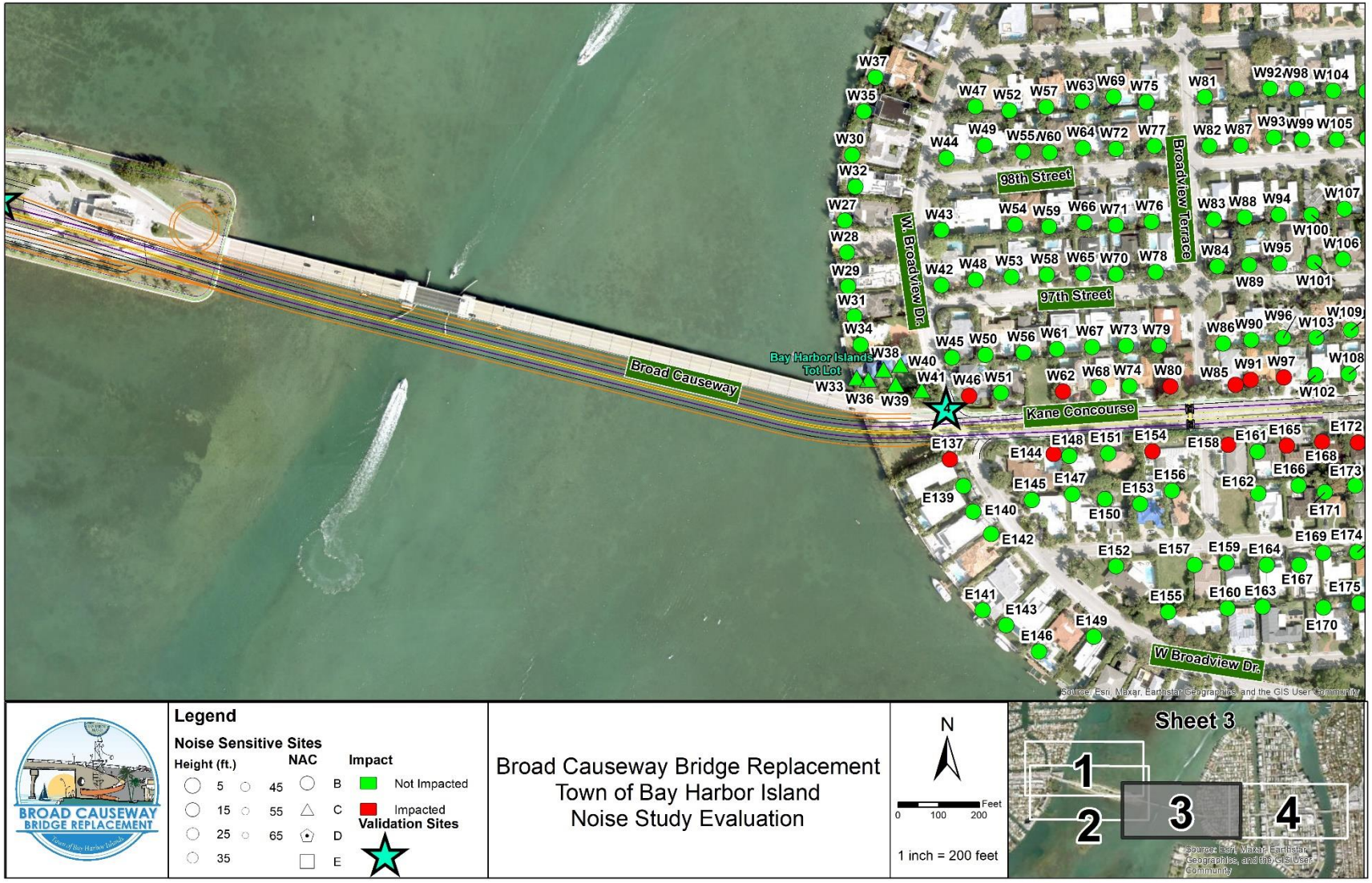
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community


Broad Causeway
Bay Harbor Islands Tot Lot
W. Broadview Dr.
Broadview Terrace
98th Street
97th Street
Kane Concourse
W Broadview Dr.
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
BROAD CAUSEWAY BRIDGE REPLACEMENT
Legend
Noise Sensitive Sites
Height (ft.)
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Impact
Not Impacted
Impacted
Validation Sites
Broad Causeway Bridge Replacement
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Noise Study Evaluation
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Feet
1 inch = 200 feet
Sheet 3
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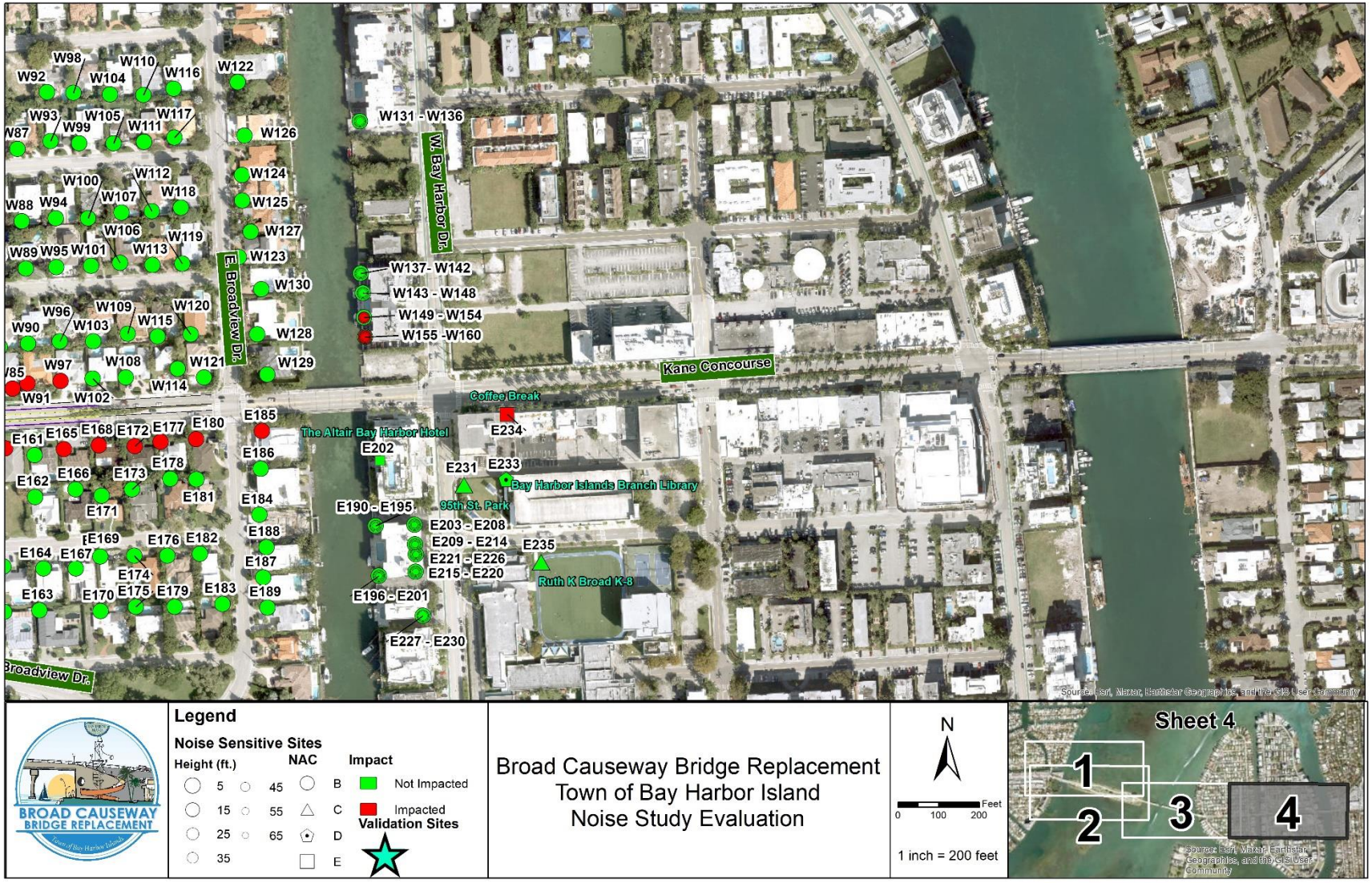
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community


W98
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W126
W131 - W136
W. Bay Harbor Dr.
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W124
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W127
W119
W89
W95
W101
W113
W123
E. Broadview Dr.
W137- W142
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W143 - W148
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W120
W149 - W154
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W115
W155 -W160
W128
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W108
W121
W129
Kane Concourse
W91
W102
W114
Coffee Break
E185
E234
E161
E165
E168
E172
E177
E180
The Altair Bay Harbor Hotel
E202
E186
E231
E233
E178
E162
E166
E173
Bay Harbor Islands Branch Library
E181
E171
E184
E190 - E195
95th St. Park
E203 - E208
E188
E209 - E214
E169
E176
E182
E235
E164
E167
E221 - E226
E187
E174
E215 - E220
Ruth K Broad K-8
E163
E170
E175
E179
E183
E189
E196 - E201
E227 - E230
Broadview Dr.
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
Legend
Noise Sensitive Sites
Height (ft.)
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NAC
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Impact
Not Impacted
Impacted
Validation Sites
Broad Causeway Bridge Replacement
Town of Bay Harbor Island
Noise Study Evaluation
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200
Feet
1 inch = 200 feet
Sheet 4
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Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

APPENDIX C: Predicted Noise Levels

Common Noise Environment	Aerial Sheet Number	Receptor ID	Activity Category	Property Type	Number of Residences Represented	Height Above Ground (ft.)	Predicted Noise Level			NAC Approached or Exceeded?	Difference between Build and Existing dB(A)	Substantial Noise Increase?
							2022 Existing Condition dB(A)	2050 No Build Condition dB(A)	2050 Build Condition dB(A)			
Residences SW of Broad Causeway Bridge	2	E1	B	Residence	1	5	46.3	47.8	46.9	NO	0.6	NO
	2	E2	B	Residence	1	5	43.9	45.4	44.1	NO	0.2	NO
	2	E3	B	Residence	1	5	49.2	50.7	49.5	NO	0.3	NO
	2	E4	B	Residence	1	5	45.8	47.4	46.3	NO	0.5	NO
	2	E5	B	Residence	1	5	44.4	45.9	44.0	NO	-0.4	NO
	2	E6	B	Residence	1	5	49.6	51.1	49.6	NO	0.0	NO
	2	E7	B	Residence	1	5	51.8	53.4	52.2	NO	0.4	NO
	2	E8	B	Residence	1	5	52.0	53.5	52.3	NO	0.3	NO
	2	E9	B	Residence	1	5	47.1	48.6	46.1	NO	-1.0	NO
	2	E10	B	Residence	1	5	52.0	53.5	52.2	NO	0.2	NO
	2	E11	B	Residence	1	5	45.9	47.4	45.8	NO	-0.1	NO
	2	E12	B	Residence	1	5	50.1	51.6	49.9	NO	-0.2	NO
	2	E13	B	Residence	1	5	52.2	53.8	52.4	NO	0.2	NO
	2	E14	B	Residence	1	5	52.3	53.8	52.3	NO	0.0	NO
	2	E15	B	Residence	1	5	33.1	34.7	33.5	NO	0.4	NO
	2	E16	B	Residence	1	15	32.1	33.7	32.9	NO	0.8	NO
	2	E17	B	Residence	1	25	34.1	35.7	34.7	NO	0.6	NO
	2	E18	B	Residence	1	35	36.6	38.2	36.9	NO	0.3	NO
	2	E19	B	Residence	1	5	52.3	53.8	52.3	NO	0.0	NO
	2	E20	B	Residence	1	5	43.8	45.3	43.6	NO	-0.2	NO
	2	E21	B	Residence	1	15	45.4	47.0	45.3	NO	-0.1	NO
	2	E22	B	Residence	1	25	46.4	47.9	46.3	NO	-0.1	NO
	2	E23	B	Residence	1	35	47.5	49.1	47.3	NO	-0.2	NO
	2	E24	B	Residence	1	5	42.9	44.5	42.7	NO	-0.2	NO
	2	E25	B	Residence	1	15	44.5	46.1	44.5	NO	0.0	NO
	2	E26	B	Residence	1	25	45.5	47.0	45.4	NO	-0.1	NO
	2	E27	B	Residence	1	35	46.4	47.9	46.2	NO	-0.2	NO
	2	E28	B	Residence	1	5	52.8	54.3	52.8	NO	0.0	NO

Common Noise Environment	Aerial Sheet Number	Receptor ID	Activity Category	Property Type	Number of Residences Represented	Height Above Ground (ft.)	Predicted Noise Level			NAC Approached or Exceeded?	Difference between Build and Existing dB(A)	Substantial Noise Increase?
							2022 Existing Condition dB(A)	2050 No Build Condition dB(A)	2050 Build Condition dB(A)			
	2	E29	B	Residence	1	5	50.1	51.6	49.2	NO	-0.9	NO
	2	E30	B	Residence	1	5	52.8	54.3	52.7	NO	-0.1	NO
	2	E31	B	Residence	1	5	52.3	53.8	51.6	NO	-0.7	NO
	2	E32	B	Residence	1	5	53.0	54.5	52.9	NO	-0.1	NO
	2	E33	B	Residence	1	5	47.1	48.5	44.5	NO	-2.6	NO
	2	E34	B	Residence	1	15	46.6	48.0	45.7	NO	-0.9	NO
	2	E35	B	Residence	1	25	46.4	47.8	45.8	NO	-0.6	NO
	2	E36	B	Residence	1	35	46.5	47.9	45.9	NO	-0.6	NO
	2	E37	B	Residence	1	5	47.2	48.6	44.6	NO	-2.6	NO
	2	E38	B	Residence	1	15	46.7	48.1	45.9	NO	-0.8	NO
	2	E39	B	Residence	1	25	46.6	48.0	45.9	NO	-0.7	NO
	2	E40	B	Residence	1	35	46.7	48.1	46.0	NO	-0.7	NO
	2	E41	B	Residence	1	5	53.3	54.8	53.2	NO	-0.1	NO
	2	E42	B	Residence	1	5	47.4	48.8	44.8	NO	-2.6	NO
	2	E43	B	Residence	1	15	46.9	48.3	46.1	NO	-0.8	NO
	2	E44	B	Residence	1	25	46.8	48.2	46.1	NO	-0.7	NO
	2	E45	B	Residence	1	35	47.0	48.4	46.3	NO	-0.7	NO
	2	E46	B	Residence	1	5	47.6	48.9	44.9	NO	-2.7	NO
	2	E47	B	Residence	1	15	47.1	48.5	46.3	NO	-0.8	NO
	2	E48	B	Residence	1	25	46.9	48.3	46.2	NO	-0.7	NO
	2	E49	B	Residence	1	35	47.2	48.6	46.4	NO	-0.8	NO
	2	E50	B	Residence	1	5	47.6	49.0	45.0	NO	-2.6	NO
	2	E51	B	Residence	1	15	47.2	48.6	46.4	NO	-0.8	NO
	2	E52	B	Residence	1	25	47.1	48.5	46.3	NO	-0.8	NO
	2	E53	B	Residence	1	35	47.3	48.7	46.5	NO	-0.8	NO

Common Noise Environment	Aerial Sheet Number	Receptor ID	Activity Category	Property Type	Number of Residences Represented	Height Above Ground (ft.)	Predicted Noise Level			NAC Approached or Exceeded?	Difference between Build and Existing dB(A)	Substantial Noise Increase?
							2022 Existing Condition dB(A)	2050 No Build Condition dB(A)	2050 Build Condition dB(A)			
	2	E54	B	Residence	1	5	47.7	49.1	45.1	NO	-2.6	NO
	2	E55	B	Residence	1	15	47.3	48.7	46.5	NO	-0.8	NO
	2	E56	B	Residence	1	25	47.2	48.5	46.3	NO	-0.9	NO
	2	E57	B	Residence	1	35	47.5	48.9	46.7	NO	-0.8	NO
	2	E58	B	Residence	1	5	48.0	49.4	45.4	NO	-2.6	NO
	2	E59	B	Residence	1	15	47.6	49.0	46.8	NO	-0.8	NO
	2	E60	B	Residence	1	25	47.5	48.9	46.7	NO	-0.8	NO
	2	E61	B	Residence	1	35	47.8	49.2	47.0	NO	-0.8	NO
	2	E62	B	Residence	1	5	48.1	49.5	45.6	NO	-2.5	NO
	2	E63	B	Residence	1	15	47.8	49.2	47.0	NO	-0.8	NO
	2	E64	B	Residence	1	25	47.7	49.1	46.8	NO	-0.9	NO
	2	E65	B	Residence	1	35	48.0	49.4	47.2	NO	-0.8	NO
	2	E66	B	Residence	1	5	48.4	49.8	45.9	NO	-2.5	NO
	2	E67	B	Residence	1	15	48.2	49.6	47.3	NO	-0.9	NO
	2	E68	B	Residence	1	25	48.1	49.5	47.1	NO	-1.0	NO
	2	E69	B	Residence	1	35	48.5	49.9	47.7	NO	-0.8	NO
	2	E70	B	Residence	1	5	48.5	49.9	46.0	NO	-2.5	NO
	2	E71	B	Residence	1	15	48.4	49.8	47.5	NO	-0.9	NO
	2	E72	B	Residence	1	25	48.3	49.6	47.3	NO	-1.0	NO
	2	E73	B	Residence	1	35	48.7	50.1	47.9	NO	-0.8	NO
	2	E74	B	Residence	1	5	49.5	51.1	49.1	NO	-0.4	NO
	2	E75	B	Residence	1	15	51.3	52.9	50.9	NO	-0.4	NO
	2	E76	B	Residence	1	25	53.0	54.5	52.4	NO	-0.6	NO

Common Noise Environment	Aerial Sheet Number	Receptor ID	Activity Category	Property Type	Number of Residences Represented	Height Above Ground (ft.)	Predicted Noise Level			NAC Approached or Exceeded?	Difference between Build and Existing dB(A)	Substantial Noise Increase?
							2022 Existing Condition dB(A)	2050 No Build Condition dB(A)	2050 Build Condition dB(A)			
	2	E77	B	Residence	1	35	54.6	56.1	54.3	NO	-0.3	NO
	2	E78	B	Residence	1	5	48.7	50.0	46.1	NO	-2.6	NO
	2	E79	B	Residence	1	15	48.5	49.9	47.6	NO	-0.9	NO
	2	E80	B	Residence	1	25	48.4	49.8	47.4	NO	-1.0	NO
	2	E81	B	Residence	1	35	48.9	50.3	48.1	NO	-0.8	NO
	2	E82	B	Residence	1	5	48.8	50.2	46.3	NO	-2.5	NO
	2	E83	B	Residence	1	15	48.7	50.1	47.7	NO	-1.0	NO
	2	E84	B	Residence	1	25	48.6	49.9	47.5	NO	-1.1	NO
	2	E85	B	Residence	1	35	49.1	50.5	48.3	NO	-0.8	NO
	2	E86	B	Residence	1	5	49.3	50.6	46.7	NO	-2.6	NO
	2	E87	B	Residence	1	15	49.1	50.5	48.1	NO	-1.0	NO
	2	E88	B	Residence	1	25	49.0	50.4	47.9	NO	-1.1	NO
	2	E89	B	Residence	1	35	49.6	51.1	48.9	NO	-0.7	NO
	2	E90	B	Residence	1	5	49.5	50.9	48.5	NO	-1.0	NO
	2	E91	B	Residence	1	15	46.4	47.8	45.3	NO	-1.1	NO
	2	E92	B	Residence	1	25	46.6	48.1	45.7	NO	-0.9	NO
	2	E93	B	Residence	1	35	49.8	51.3	50.7	NO	0.9	NO
	2	E94	B	Residence	1	5	49.5	50.9	47.0	NO	-2.5	NO
	2	E95	B	Residence	1	15	49.3	50.7	48.3	NO	-1.0	NO
	2	E96	B	Residence	1	25	49.3	50.7	48.1	NO	-1.2	NO
	2	E97	B	Residence	1	35	49.9	51.3	49.1	NO	-0.8	NO
	2	E98	B	Residence	1	5	49.8	51.2	47.6	NO	-2.2	NO
	2	E99	B	Residence	1	15	49.8	51.2	49.0	NO	-0.8	NO

Common Noise Environment	Aerial Sheet Number	Receptor ID	Activity Category	Property Type	Number of Residences Represented	Height Above Ground (ft.)	Predicted Noise Level			NAC Approached or Exceeded?	Difference between Build and Existing dB(A)	Substantial Noise Increase?
							2022 Existing Condition dB(A)	2050 No Build Condition dB(A)	2050 Build Condition dB(A)			
	2	E100	B	Residence	1	25	50.2	51.6	49.6	NO	-0.6	NO
	2	E101	B	Residence	1	35	51.3	52.8	51.2	NO	-0.1	NO
	2	E102	B	Residence	1	5	44.9	46.4	45.1	NO	0.2	NO
	2	E103	B	Residence	1	15	45.7	47.2	47.0	NO	1.3	NO
	2	E104	B	Residence	1	25	47.9	49.4	49.0	NO	1.1	NO
	2	E105	B	Residence	1	35	50.1	51.6	51.0	NO	0.9	NO
	2	E106	B	Residence	1	5	48.7	50.2	48.5	NO	-0.2	NO
	2	E107	B	Residence	1	15	45.2	46.7	44.9	NO	-0.3	NO
	2	E108	B	Residence	1	25	45.3	46.8	44.7	NO	-0.6	NO
	2	E109	B	Residence	1	35	46.7	48.3	46.5	NO	-0.2	NO
	2	E110	B	Residence	1	5	50.1	51.4	47.8	NO	-2.3	NO
	2	E111	B	Residence	1	15	50.2	51.6	49.4	NO	-0.8	NO
	2	E112	B	Residence	1	25	50.7	52.1	50.0	NO	-0.7	NO
	2	E113	B	Residence	1	35	51.7	53.2	51.6	NO	-0.1	NO
	2	E114	B	Residence	1	5	43.3	44.9	44.0	NO	0.7	NO
	2	E115	B	Residence	1	15	44.3	45.8	45.0	NO	0.7	NO
	2	E116	B	Residence	1	25	46.9	48.4	47.5	NO	0.6	NO
	2	E117	B	Residence	1	35	48.9	50.4	49.8	NO	0.9	NO
	2	E118	B	Residence	1	5	42.7	44.3	43.2	NO	0.5	NO
	2	E119	B	Residence	1	15	45.4	46.9	46.0	NO	0.6	NO
	2	E120	B	Residence	1	25	46.4	47.9	47.6	NO	1.2	NO
	2	E121	B	Residence	1	35	49.8	51.3	50.7	NO	0.9	NO
	2	E122	B	Residence	1	5	37.3	38.8	37.8	NO	0.5	NO

Common Noise Environment	Aerial Sheet Number	Receptor ID	Activity Category	Property Type	Number of Residences Represented	Height Above Ground (ft.)	Predicted Noise Level			NAC Approached or Exceeded?	Difference between Build and Existing dB(A)	Substantial Noise Increase?
							2022 Existing Condition dB(A)	2050 No Build Condition dB(A)	2050 Build Condition dB(A)			
	2	E123	B	Residence	1	15	39.7	41.2	39.8	NO	0.1	NO
	2	E124	B	Residence	1	25	42.7	44.2	42.2	NO	-0.5	NO
	2	E125	B	Residence	1	35	46.4	47.9	45.9	NO	-0.5	NO
North Bayshore Park	2	E126	C	Park	0	5	59.5	61.0	58.6	NO	-0.9	NO
	2	E127	C	Park		5	63.9	65.3	62.9	NO	-1.0	NO
	2	E128	C	Park		5	67.3	68.5	65.9	NO	-1.4	NO
	2	E129	C	Park		5	55.8	57.2	54.0	NO	-1.8	NO
	2	E130	C	Park		5	56.5	57.9	54.6	NO	-1.9	NO
	2	E131	C	Park		5	61.7	63.0	59.1	NO	-2.6	NO
	2	E132	C	Park		5	59.3	60.7	57.6	NO	-1.7	NO
	2	E133	C	Park		5	60.7	62.1	58.3	NO	-2.4	NO
Residences SE of Broad Causeway Bridge	3	E137	B	Residence	1	5	62.5	63.9	66.8	YES	4.3	NO
	3	E139	B	Residence	1	5	56.4	57.9	59.2	NO	2.8	NO
	3	E140	B	Residence	1	5	53.7	55.2	56.7	NO	3.0	NO
	3	E141	B	Residence	1	5	48.3	49.7	50.4	NO	2.1	NO
	3	E142	B	Residence	1	5	51.5	53.1	54.2	NO	2.7	NO
	3	E143	B	Residence	1	5	48.6	50.1	50.5	NO	1.9	NO
	3	E144	B	Residence	1	5	64.8	66.0	66.5	YES	1.7	NO
	3	E145	B	Residence	1	5	54.1	55.7	56.6	NO	2.5	NO
	3	E146	B	Residence	1	5	47.3	48.8	48.7	NO	1.4	NO
	3	E147	B	Residence	1	5	55.0	56.5	57.1	NO	2.1	NO
	3	E148	B	Residence	1	5	64.0	65.3	65.8	NO	1.8	NO
	3	E149	B	Residence	1	5	46.9	48.6	49.1	NO	2.2	NO
	3	E150	B	Residence	1	5	54.7	56.3	56.8	NO	2.1	NO

Common Noise Environment	Aerial Sheet Number	Receptor ID	Activity Category	Property Type	Number of Residences Represented	Height Above Ground (ft.)	Predicted Noise Level			NAC Approached or Exceeded?	Difference between Build and Existing dB(A)	Substantial Noise Increase?
							2022 Existing Condition dB(A)	2050 No Build Condition dB(A)	2050 Build Condition dB(A)			
	3	E151	B	Residence	1	5	64.1	65.4	65.7	NO	1.6	NO
	3	E152	B	Residence	1	5	49.7	51.4	51.8	NO	2.1	NO
	3	E153	B	Residence	1	5	54.8	56.4	56.7	NO	1.9	NO
	3	E154	B	Residence	1	5	64.5	65.9	66.0	YES	1.5	NO
	3	E155	B	Residence	1	5	48.9	50.6	50.9	NO	2.0	NO
	3	E156	B	Residence	1	5	56.4	58.0	58.2	NO	1.8	NO
	3	E157	B	Residence	1	5	51.7	53.5	53.6	NO	1.9	NO
	3	E158	B	Residence	1	5	66.2	67.8	67.8	YES	1.6	NO
	3	E159	B	Residence	1	5	51.7	53.5	53.7	NO	2.0	NO
	3	E160	B	Residence	1	5	49.4	51.1	51.3	NO	1.9	NO
	4	E161	B	Residence	1	5	63.9	65.5	65.5	NO	1.6	NO
	4	E162	B	Residence	1	5	56.3	57.9	57.8	NO	1.5	NO
	4	E163	B	Residence	1	5	49.8	51.5	51.6	NO	1.8	NO
	4	E164	B	Residence	1	5	50.6	52.3	52.5	NO	1.9	NO
	4	E165	B	Residence	1	5	65.4	67.0	67.0	YES	1.6	NO
	4	E166	B	Residence	1	5	56.7	58.4	58.3	NO	1.6	NO
	4	E167	B	Residence	1	5	50.7	52.3	52.5	NO	1.8	NO
	4	E168	B	Residence	1	5	65.7	67.3	67.3	YES	1.6	NO
	4	E169	B	Residence	1	5	51.8	53.4	53.4	NO	1.6	NO
	4	E170	B	Residence	1	5	50.1	51.6	51.7	NO	1.6	NO
	4	E171	B	Residence	1	5	56.3	58.0	57.9	NO	1.6	NO
	4	E172	B	Residence	1	5	65.1	66.7	66.7	YES	1.6	NO
	4	E173	B	Residence	1	5	56.9	58.6	58.6	NO	1.7	NO

Common Noise Environment	Aerial Sheet Number	Receptor ID	Activity Category	Property Type	Number of Residences Represented	Height Above Ground (ft.)	Predicted Noise Level			NAC Approached or Exceeded?	Difference between Build and Existing dB(A)	Substantial Noise Increase?
							2022 Existing Condition dB(A)	2050 No Build Condition dB(A)	2050 Build Condition dB(A)			
	4	E174	B	Residence	1	5	52.4	54.0	54.0	NO	1.6	NO
	4	E175	B	Residence	1	5	50.2	51.8	52.0	NO	1.8	NO
	4	E176	B	Residence	1	5	52.7	54.3	54.3	NO	1.6	NO
	4	E177	B	Residence	1	5	66.4	67.9	67.9	YES	1.5	NO
	4	E178	B	Residence	1	5	58.9	60.4	60.4	NO	1.5	NO
	4	E179	B	Residence	1	5	50.0	51.6	51.7	NO	1.7	NO
	4	E180	B	Residence	1	5	68.4	69.8	69.8	YES	1.4	NO
	4	E181	B	Residence	1	5	58.6	60.2	60.2	NO	1.6	NO
	4	E182	B	Residence	1	5	52.8	54.4	54.5	NO	1.7	NO
	4	E183	B	Residence	1	5	50.4	52.0	52.1	NO	1.7	NO
	4	E184	B	Residence	1	5	56.8	58.4	58.4	NO	1.6	NO
	4	E185	B	Residence	1	5	70.6	71.9	71.9	YES	1.3	NO
	4	E186	B	Residence	1	5	61.8	63.3	63.3	NO	1.5	NO
	4	E187	B	Residence	1	5	52.2	53.8	53.8	NO	1.6	NO
	4	E188	B	Residence	1	5	53.0	54.6	54.7	NO	1.7	NO
	4	E189	B	Residence	1	5	51.8	53.3	53.3	NO	1.5	NO
	4	E190	B	Residence	1	15	57.3	58.8	58.8	NO	1.5	NO
	4	E191	B	Residence	1	25	58.2	59.7	59.7	NO	1.5	NO
	4	E192	B	Residence	1	35	59.3	60.8	60.8	NO	1.5	NO
	4	E193	B	Residence	1	45	59.9	61.4	61.4	NO	1.5	NO
	4	E194	B	Residence	1	55	60.1	61.6	61.6	NO	1.5	NO
	4	E195	B	Residence	1	65	60.3	61.9	61.9	NO	1.6	NO
	4	E196	B	Residence	1	15	54.4	56.0	56.0	NO	1.6	NO

Common Noise Environment	Aerial Sheet Number	Receptor ID	Activity Category	Property Type	Number of Residences Represented	Height Above Ground (ft.)	Predicted Noise Level			NAC Approached or Exceeded?	Difference between Build and Existing dB(A)	Substantial Noise Increase?
							2022 Existing Condition dB(A)	2050 No Build Condition dB(A)	2050 Build Condition dB(A)			
	4	E197	B	Residence	1	25	55.1	56.7	56.7	NO	1.6	NO
	4	E198	B	Residence	1	35	55.9	57.4	57.4	NO	1.5	NO
	4	E199	B	Residence	1	45	56.9	58.4	58.4	NO	1.5	NO
	4	E200	B	Residence	1	55	57.8	59.3	59.3	NO	1.5	NO
	4	E201	B	Residence	1	65	58.2	59.7	59.7	NO	1.5	NO
	4	E203	B	Residence	1	15	55.2	56.7	56.7	NO	1.5	NO
	4	E204	B	Residence	1	25	56.7	58.2	58.2	NO	1.5	NO
	4	E205	B	Residence	1	35	57.9	59.4	59.4	NO	1.5	NO
	4	E206	B	Residence	1	45	58.4	59.9	59.9	NO	1.5	NO
	4	E207	B	Residence	1	55	58.6	60.1	60.1	NO	1.5	NO
	4	E208	B	Residence	1	65	58.7	60.3	60.3	NO	1.6	NO
	4	E209	B	Residence	1	15	54.1	55.7	55.7	NO	1.6	NO
	4	E210	B	Residence	1	25	55.4	56.9	56.9	NO	1.5	NO
	4	E211	B	Residence	1	35	56.6	58.1	58.1	NO	1.5	NO
	4	E212	B	Residence	1	45	57.5	59.1	59.0	NO	1.5	NO
	4	E213	B	Residence	1	55	57.8	59.3	59.3	NO	1.5	NO
	4	E214	B	Residence	1	65	57.9	59.5	59.5	NO	1.6	NO
	4	E215	B	Residence	1	15	53.1	54.6	54.7	NO	1.6	NO
	4	E216	B	Residence	1	25	54.0	55.5	55.6	NO	1.6	NO
	4	E217	B	Residence	1	35	54.9	56.4	56.5	NO	1.6	NO
	4	E218	B	Residence	1	45	55.9	57.4	57.4	NO	1.5	NO
	4	E219	B	Residence	1	55	56.6	58.2	58.2	NO	1.6	NO
	4	E220	B	Residence	1	65	57.0	58.5	58.5	NO	1.5	NO

Common Noise Environment	Aerial Sheet Number	Receptor ID	Activity Category	Property Type	Number of Residences Represented	Height Above Ground (ft.)	Predicted Noise Level			NAC Approached or Exceeded?	Difference between Build and Existing dB(A)	Substantial Noise Increase?
							2022 Existing Condition dB(A)	2050 No Build Condition dB(A)	2050 Build Condition dB(A)			
	4	E221	B	Residence	1	15	53.8	55.3	55.4	NO	1.6	NO
	4	E222	B	Residence	1	25	54.9	56.4	56.4	NO	1.5	NO
	4	E223	B	Residence	1	35	56.0	57.5	57.5	NO	1.5	NO
	4	E224	B	Residence	1	45	57.0	58.5	58.5	NO	1.5	NO
	4	E225	B	Residence	1	55	57.4	59.0	58.9	NO	1.5	NO
	4	E226	B	Residence	1	65	57.6	59.1	59.1	NO	1.5	NO
	4	E227	B	Residence	1	15	51.2	52.7	52.8	NO	1.6	NO
	4	E228	B	Residence	1	25	52.0	53.5	53.6	NO	1.6	NO
	4	E229	B	Residence	1	35	52.6	54.1	54.3	NO	1.7	NO
	4	E230	B	Residence	1	45	53.4	54.8	54.9	NO	1.5	NO
The Altair Bay Harbor Hotel	4	E202	E	Hotel Pool	0	65	65.6	67.1	67.1	NO	1.5	NO
95th St. Park in Bay Harbor Islands	4	E231	C	Park	0	5	55.5	56.9	56.9	NO	1.4	NO
Bay Harbor Islands Branch Library	4	E233	D	Library (interior)	0	5	31.2	32.8	32.8	NO	1.6	NO
Coffee Break	4	E234	E	Restaurant	0	5	71.3	72.5	72.5	YES	1.2	NO
Ruth K. Broad Bay Harbor K-8 Center	4	E235	C	School (exterior)	0	5	43.5	45.1	45.2	NO	1.7	NO
Residences NW of Broad Causeway Bridge	1	W1	B	Residence	1	5	52.6	54.1	53.8	NO	1.2	NO
	1	W2	B	Residence	1	5	51.4	53.0	52.5	NO	1.1	NO
	1	W3	B	Residence	1	5	51.3	52.8	51.8	NO	0.5	NO
	1	W4	B	Residence	1	5	50.0	51.6	50.3	NO	0.3	NO
	1	W5	B	Residence	30	5	61.8	63.3	61.6	NO	-0.2	NO

Common Noise Environment	Aerial Sheet Number	Receptor ID	Activity Category	Property Type	Number of Residences Represented	Height Above Ground (ft.)	Predicted Noise Level			NAC Approached or Exceeded?	Difference between Build and Existing dB(A)	Substantial Noise Increase?
							2022 Existing Condition dB(A)	2050 No Build Condition dB(A)	2050 Build Condition dB(A)			
	1	W6	B	Residence	1	5	54.4	56.0	54.0	NO	-0.4	NO
	1	W7	B	Residence	1	5	47.7	49.2	47.6	NO	-0.1	NO
	1	W8	B	Residence	1	5	49.8	51.3	49.7	NO	-0.1	NO
	1	W9	B	Residence	1	5	46.9	48.5	47.0	NO	0.1	NO
	1	W10	B	Residence	1	5	48.9	50.4	48.3	NO	-0.6	NO
	1	W11	B	Residence	1	5	45.4	46.9	44.7	NO	-0.7	NO
	1	W12	B	Residence	1	5	53.7	55.2	53.3	NO	-0.4	NO
	1	W13	B	Residence	1	5	46.1	47.7	45.8	NO	-0.3	NO
	1	W14	B	Residence	1	5	45.0	46.6	43.9	NO	-1.1	NO
	1	W15	B	Residence	1	5	44.7	46.2	43.7	NO	-1.0	NO
	1	W16	B	Residence	1	5	53.1	54.7	52.3	NO	-0.8	NO
	1	W17	B	Residence	1	5	43.9	45.4	43.1	NO	-0.8	NO
	1	W18	B	Residence	1	5	43.4	45.0	42.1	NO	-1.3	NO
	1	W19	B	Residence	1	5	44.4	45.9	42.8	NO	-1.6	NO
	1	W21	B	Residence	1	5	52.3	53.8	51.1	NO	-1.2	NO
	1	W22	B	Residence	1	5	47.8	49.3	47.3	NO	-0.5	NO
	1	W23	B	Residence	1	5	50.8	52.3	49.6	NO	-1.2	NO
	1	W24	B	Residence	1	5	49.0	50.5	47.5	NO	-1.5	NO
	1	W25	B	Residence	1	5	48.2	49.7	46.5	NO	-1.7	NO
	1	W26	B	Residence	1	5	47.5	49.0	45.7	NO	-1.8	NO
White House Inn on The Bay Motel	1	W20	E	Motel Pool	0	5	56.0	57.5	55.1	NO	-0.9	NO
Bay Harbor Islands Tot Lot	3	W33	C	Park	0	5	65.6	67.1	61.6	NO	-4.0	NO
	3	W36	C	Park		5	65.1	66.6	61.8	NO	-3.3	NO

Common Noise Environment	Aerial Sheet Number	Receptor ID	Activity Category	Property Type	Number of Residences Represented	Height Above Ground (ft.)	Predicted Noise Level			NAC Approached or Exceeded?	Difference between Build and Existing dB(A)	Substantial Noise Increase?
							2022 Existing Condition dB(A)	2050 No Build Condition dB(A)	2050 Build Condition dB(A)			
	3	W38	C	Park		5	62.0	63.6	60.6	NO	-1.4	NO
	3	W39	C	Park		5	64.4	65.8	62.7	NO	-1.7	NO
	3	W40	C	Park		5	60.5	62.1	60.1	NO	-0.4	NO
	3	W41	C	Park		5	64.4	65.8	64.4	NO	0.0	NO
Residences NE of Broad Causeway Bridge	3	W27	B	Residence	1	5	54.1	55.6	52.8	NO	-1.3	NO
	3	W28	B	Residence	1	5	54.9	56.4	54.0	NO	-0.9	NO
	3	W29	B	Residence	1	5	56.2	57.7	55.6	NO	-0.6	NO
	3	W30	B	Residence	1	5	52.3	53.8	50.1	NO	-2.2	NO
	3	W31	B	Residence	1	5	57.6	59.2	57.0	NO	-0.6	NO
	3	W32	B	Residence	1	5	52.5	54.0	50.5	NO	-2.0	NO
	3	W34	B	Residence	1	5	60.1	61.7	59.2	NO	-0.9	NO
	3	W35	B	Residence	1	5	51.1	52.6	48.4	NO	-2.7	NO
	3	W37	B	Residence	1	5	50.3	51.8	47.5	NO	-2.8	NO
	3	W42	B	Residence	1	5	51.3	52.8	54.1	NO	2.8	NO
	3	W43	B	Residence	1	5	48.3	49.8	50.2	NO	1.9	NO
	3	W44	B	Residence	1	5	44.6	46.1	46.1	NO	1.5	NO
	3	W45	B	Residence	1	5	57.5	59.1	58.8	NO	1.3	NO
	3	W46	B	Residence	1	5	64.5	65.9	66.1	YES	1.6	NO
	3	W47	B	Residence	1	5	43.1	44.6	45.1	NO	2.0	NO
	3	W48	B	Residence	1	5	50.3	51.9	52.6	NO	2.3	NO
	3	W49	B	Residence	1	5	42.3	43.8	43.6	NO	1.3	NO
	3	W50	B	Residence	1	5	54.8	56.4	56.4	NO	1.6	NO
	3	W51	B	Residence	1	5	63.5	64.9	65.8	NO	2.3	NO

Common Noise Environment	Aerial Sheet Number	Receptor ID	Activity Category	Property Type	Number of Residences Represented	Height Above Ground (ft.)	Predicted Noise Level			NAC Approached or Exceeded?	Difference between Build and Existing dB(A)	Substantial Noise Increase?
							2022 Existing Condition dB(A)	2050 No Build Condition dB(A)	2050 Build Condition dB(A)			
	3	W52	B	Residence	1	5	42.6	44.1	44.3	NO	1.7	NO
	3	W53	B	Residence	1	5	49.5	51.1	51.2	NO	1.7	NO
	3	W54	B	Residence	1	5	46.3	47.9	47.9	NO	1.6	NO
	3	W55	B	Residence	1	5	43.8	45.4	45.5	NO	1.7	NO
	3	W56	B	Residence	1	5	54.9	56.4	56.9	NO	2.0	NO
	3	W57	B	Residence	1	5	43.3	44.8	45.0	NO	1.7	NO
	3	W58	B	Residence	1	5	49.7	51.2	51.2	NO	1.5	NO
	3	W59	B	Residence	1	5	46.8	48.3	48.6	NO	1.8	NO
	3	W60	B	Residence	1	5	44.3	45.8	46.5	NO	2.2	NO
	3	W61	B	Residence	1	5	54.8	56.3	57.0	NO	2.2	NO
	3	W62	B	Residence	1	5	64.2	65.5	66.0	YES	1.8	NO
	3	W63	B	Residence	1	5	43.6	45.2	45.3	NO	1.7	NO
	3	W64	B	Residence	1	5	44.0	45.4	46.1	NO	2.1	NO
	3	W65	B	Residence	1	5	49.0	50.5	50.5	NO	1.5	NO
	3	W66	B	Residence	1	5	46.1	47.6	48.1	NO	2.0	NO
	3	W67	B	Residence	1	5	53.8	55.3	55.7	NO	1.9	NO
	3	W68	B	Residence	1	5	63.6	65.0	65.4	NO	1.8	NO
	3	W69	B	Residence	1	5	43.4	44.9	45.0	NO	1.6	NO
	3	W70	B	Residence	1	5	49.4	50.9	50.9	NO	1.5	NO
	3	W71	B	Residence	1	5	46.5	48.0	48.4	NO	1.9	NO
	3	W72	B	Residence	1	5	44.3	45.8	46.7	NO	2.4	NO
	3	W73	B	Residence	1	5	54.5	55.9	56.1	NO	1.6	NO
	3	W74	B	Residence	1	5	64.1	65.4	65.7	NO	1.6	NO

Common Noise Environment	Aerial Sheet Number	Receptor ID	Activity Category	Property Type	Number of Residences Represented	Height Above Ground (ft.)	Predicted Noise Level			NAC Approached or Exceeded?	Difference between Build and Existing dB(A)	Substantial Noise Increase?
							2022 Existing Condition dB(A)	2050 No Build Condition dB(A)	2050 Build Condition dB(A)			
	3	W75	B	Residence	1	5	43.8	45.3	45.8	NO	2.0	NO
	3	W76	B	Residence	1	5	46.9	48.4	48.7	NO	1.8	NO
	3	W77	B	Residence	1	5	44.4	45.9	46.6	NO	2.2	NO
	3	W78	B	Residence	1	5	50.1	51.6	51.6	NO	1.5	NO
	3	W79	B	Residence	1	5	55.4	56.9	57.0	NO	1.6	NO
	3	W80	B	Residence	1	5	65.9	67.2	67.3	YES	1.4	NO
	3	W81	B	Residence	1	5	44.4	45.8	46.2	NO	1.8	NO
	3	W82	B	Residence	1	5	45.0	46.5	46.8	NO	1.8	NO
	3	W83	B	Residence	1	5	47.3	48.8	49.0	NO	1.7	NO
	3	W84	B	Residence	1	5	50.3	51.8	51.8	NO	1.5	NO
	3	W85	B	Residence	1	5	68.3	69.5	69.5	YES	1.2	NO
	3	W86	B	Residence	1	5	57.1	58.5	58.5	NO	1.4	NO
	3	W87	B	Residence	1	5	44.6	46.1	46.5	NO	1.9	NO
	3	W88	B	Residence	1	5	46.9	48.4	48.6	NO	1.7	NO
	3	W89	B	Residence	1	5	49.6	51.2	51.2	NO	1.6	NO
	3	W90	B	Residence	1	5	56.0	57.4	57.5	NO	1.5	NO
	3	W91	B	Residence	1	5	66.8	68.1	68.1	YES	1.3	NO
	3	W92	B	Residence	1	5	44.0	45.5	45.8	NO	1.8	NO
	3	W93	B	Residence	1	5	44.7	46.2	46.4	NO	1.7	NO
	3	W94	B	Residence	1	5	47.3	48.8	48.9	NO	1.6	NO
	3	W95	B	Residence	1	5	49.7	51.2	51.2	NO	1.5	NO
	3	W96	B	Residence	1	5	56.2	57.6	57.6	NO	1.4	NO
	3	W97	B	Residence	1	5	66.7	68.0	68.0	YES	1.3	NO

Common Noise Environment	Aerial Sheet Number	Receptor ID	Activity Category	Property Type	Number of Residences Represented	Height Above Ground (ft.)	Predicted Noise Level			NAC Approached or Exceeded?	Difference between Build and Existing dB(A)	Substantial Noise Increase?
							2022 Existing Condition dB(A)	2050 No Build Condition dB(A)	2050 Build Condition dB(A)			
	3	W98	B	Residence	1	5	44.0	45.6	45.8	NO	1.8	NO
	3	W99	B	Residence	1	5	45.0	46.4	46.7	NO	1.7	NO
	4	W100	B	Residence	1	5	47.1	48.6	48.7	NO	1.6	NO
	4	W101	B	Residence	1	5	50.5	52.0	52.0	NO	1.5	NO
	4	W102	B	Residence	1	5	66.6	67.9	67.9	YES	1.3	NO
	4	W103	B	Residence	1	5	56.3	57.7	57.8	NO	1.5	NO
	4	W104	B	Residence	1	5	44.3	45.9	45.9	NO	1.6	NO
	4	W105	B	Residence	1	5	44.8	46.3	46.6	NO	1.8	NO
	4	W106	B	Residence	1	5	50.7	52.2	52.2	NO	1.5	NO
	4	W107	B	Residence	1	5	47.4	48.9	48.9	NO	1.5	NO
	4	W108	B	Residence	1	5	67.0	68.2	68.2	YES	1.2	NO
	4	W109	B	Residence	1	5	55.9	57.3	57.3	NO	1.4	NO
	4	W110	B	Residence	1	5	44.4	46.0	46.1	NO	1.7	NO
	4	W111	B	Residence	1	5	44.6	46.2	46.5	NO	1.9	NO
	4	W112	B	Residence	1	5	47.6	49.1	49.2	NO	1.6	NO
	4	W113	B	Residence	1	5	51.6	53.1	53.1	NO	1.5	NO
	4	W114	B	Residence	1	5	66.3	67.7	67.7	YES	1.4	NO
	4	W115	B	Residence	1	5	57.7	59.2	59.2	NO	1.5	NO
	4	W116	B	Residence	1	5	44.8	46.3	46.4	NO	1.6	NO
	4	W117	B	Residence	1	5	44.9	46.4	46.7	NO	1.8	NO
	4	W118	B	Residence	1	5	48.0	49.5	49.6	NO	1.6	NO
	4	W119	B	Residence	1	5	52.6	54.1	54.1	NO	1.5	NO
	4	W120	B	Residence	1	5	59.0	60.5	60.5	NO	1.5	NO

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							2022 Existing Condition dB(A)	2050 No Build Condition dB(A)	2050 Build Condition dB(A)			
	4	W121	B	Residence	1	5	69.9	71.2	71.2	YES	1.3	NO
	4	W122	B	Residence	1	5	46.1	47.6	47.7	NO	1.6	NO
	4	W123	B	Residence	1	5	53.1	54.6	54.6	NO	1.5	NO
	4	W124	B	Residence	1	5	46.1	47.6	47.6	NO	1.5	NO
	4	W125	B	Residence	1	5	47.8	49.3	49.4	NO	1.6	NO
	4	W126	B	Residence	1	5	45.4	47.0	47.1	NO	1.7	NO
	4	W127	B	Residence	1	5	47.5	49.0	49.0	NO	1.5	NO
	4	W128	B	Residence	1	5	60.8	62.2	62.2	NO	1.4	NO
	4	W129	B	Residence	1	5	69.0	70.3	70.3	YES	1.3	NO
	4	W130	B	Residence	1	5	57.0	58.5	58.5	NO	1.5	NO
	4	W131	B	Residence	1	5	50.4	52.0	52.0	NO	1.6	NO
	4	W132	B	Residence	1	15	51.5	53.1	53.2	NO	1.7	NO
	4	W133	B	Residence	1	25	52.5	53.9	54.0	NO	1.5	NO
	4	W134	B	Residence	1	35	53.2	54.7	54.8	NO	1.6	NO
	4	W135	B	Residence	1	45	53.9	55.4	55.5	NO	1.6	NO
	4	W136	B	Residence	1	55	54.5	56.0	56.0	NO	1.5	NO
	4	W137	B	Residence	1	5	56.1	57.7	57.7	NO	1.6	NO
	4	W138	B	Residence	1	15	56.6	58.1	58.1	NO	1.5	NO
	4	W139	B	Residence	1	25	57.6	59.1	59.1	NO	1.5	NO
	4	W140	B	Residence	1	35	58.7	60.2	60.3	NO	1.6	NO
	4	W141	B	Residence	1	45	59.1	60.6	60.6	NO	1.5	NO
	4	W142	B	Residence	1	55	59.3	60.8	60.8	NO	1.5	NO
	4	W143	B	Residence	1	5	57.2	58.7	58.7	NO	1.5	NO

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							2022 Existing Condition dB(A)	2050 No Build Condition dB(A)	2050 Build Condition dB(A)			
	4	W144	B	Residence	1	15	57.8	59.3	59.3	NO	1.5	NO
	4	W145	B	Residence	1	25	58.7	60.2	60.2	NO	1.5	NO
	4	W146	B	Residence	1	35	59.5	61.0	61.0	NO	1.5	NO
	4	W147	B	Residence	1	45	59.7	61.2	61.2	NO	1.5	NO
	4	W148	B	Residence	1	55	59.9	61.4	61.4	NO	1.5	NO
	4	W149	B	Residence	1	5	61.6	63.2	63.2	NO	1.6	NO
	4	W150	B	Residence	1	15	63.2	64.6	64.6	NO	1.4	NO
	4	W151	B	Residence	1	25	64.6	66.1	66.1	YES	1.5	NO
	4	W152	B	Residence	1	35	64.7	66.2	66.2	YES	1.5	NO
	4	W153	B	Residence	1	45	64.8	66.3	66.3	YES	1.5	NO
	4	W154	B	Residence	1	55	64.8	66.4	66.4	YES	1.6	NO
	4	W155	B	Residence	1	5	63.8	65.3	65.3	NO	1.5	NO
	4	W156	B	Residence	1	15	65.7	67.2	67.2	YES	1.5	NO
	4	W157	B	Residence	1	25	66.4	67.9	67.9	YES	1.5	NO
	4	W158	B	Residence	1	35	66.4	67.9	67.9	YES	1.5	NO
	4	W159	B	Residence	1	45	66.3	67.8	67.8	YES	1.5	NO
	4	W160	B	Residence	1	55	66.4	67.9	67.9	YES	1.5	NO

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