NOISE AND VIBRATION IMPACT ASSESSMENT REPORT

ADVANCED RAPID TRANSIT (ART) EAST/WEST CORRIDOR PROJECT

April 2025
(Version 5)

VIA RAPID

EXECUTIVE SUMMARY

VIA Metropolitan Transit (VIA) prepared this Noise and Vibration Impact Assessment Report for the Advanced Rapid Transit (ART) East/West Corridor Project (the Project). The Project is an approximately 7.3-mile bus rapid transit line within the City of San Antonio, Texas. The Project corridor would extend from General McMullen Drive in the west, through Downtown, to Coca Cola Place in the east, along the following roadways: Commerce Street, Buena Vista Street, Dolorosa Street, Market Street, Cherry Street, and East Houston Street (see Appendix A). The Project includes transit signal priority and is proposed to operate in a mixture of center dedicated lanes, curbside dedicated Business Access and Transit (BAT) lanes, and in mixed traffic. Based on the conceptual design, approximately 5.10 miles (70%) of the route would feature dedicated lanes, including 2.15 miles (30%) of center dedicated lanes and 2.95 miles (40%) of curbside dedicated BAT lanes. The remaining 2.20 miles (30%) would operate in mixed traffic. The Project includes 18 new or modified station areas. Stations are planned to include amenities such as off-board fare collection, real-time arrival information, security cameras, lighting, and platforms for level boarding.

The Project would include the procurement of low emission Compressed Natural Gas (CNG) vehicles to provide frequent service. Service would be provided seven days a week between 4:00 AM and 1:00 AM. On weekdays, trips will depart every 10 minutes from 6:00 AM to 9:00 PM and every 30 minutes at other times. On weekends, service will operate every 15 minutes from 6:00 AM to 7:00 PM and every 30 minutes at other times.

This report addresses the environmental effects of Project implementation related to Noise and Vibration in accordance with National Environmental Policy Act (NEPA) requirements administered by the Federal Transit Administration (FTA). The scope of the analyses was developed to support a Categorical Exclusion (CE) for the Project.

A noise impact assessment was conducted using the FTA General Noise Assessment procedures described in Section 4.4 of the FTA *Transit Noise and Vibration Impact Assessment Manual* (2018) (“FTA Manual”). The Project team selected 24 noise measurement locations to represent existing noise levels at the noise-sensitive receivers adjacent to the Project corridor. The Project team conducted noise measurements the 24 locations during the week of October 21st, 2024. Project noise levels from ART operations were then predicted based on source reference levels found in Section 4.4 General Noise Assessment of the FTA Manual as well as preliminary engineering plans for the Project and information on speeds, headways, and vehicle

type. Finally, FTA noise impact criteria were used to determine whether existing noise exposure and the predicted noise exposure increase from the Project would result in an impact. Based on FTA noise impact criteria, no noise impacts are predicted as a result of Project operations and therefore no mitigation measures are required.

As there are no ground-borne vibration impacts anticipated from the operation of the Project, the FTA Vibration Assessment criteria are not applicable. Therefore, no operational vibration impacts are expected, and no mitigation measures are required.

Construction of the Project would require the use of heavy equipment that generates relatively high noise levels. However, Project construction noise would be temporary and intermittent and would cease once construction is complete. All construction activities would be carried out in compliance with specifications and the applicable noise limits of the City of San Antonio Code of Ordinances. The following mitigation effort is proposed for potential noise-related construction impacts.

The contractor will develop a Noise Control Plan demonstrating how the construction noise limits set by the City of San Antonio's ordinance can be achieved. The Noise Control Plan must be approved by VIA prior to the start of construction. If construction is planned during nighttime hours from 10:00 p.m. and 7:00 a.m., Sundays or legal holidays, the contractor would need to obtain a noise variance. Construction noise-reducing methods that may be implemented, as necessary, include the following:

- Use low-noise emission equipment
- Use broadband backup warning devices on all vehicles
- Implement noise-deadening measures for truck loading and operations
- Conduct monitoring and maintenance of equipment to meet noise limits
- Use acoustic enclosures, shields, or shrouds for equipment and facilities
- Install high-grade engine exhaust silencers and engine-casing sound insulation
- Minimize the use of generators
- Use movable noise barriers at the source of the construction activity

Annoyance from ground borne noise and vibration is generally not an issue because of the short-term duration of most construction activities, and the main concern is potential damage to buildings. It is not expected that the construction of the Project would result in ground borne

vibration levels of 0.3 in./sec peak particle velocity (PPV) or greater, resulting in a potential damage risk to the buildings along the corridor. The exception would be historic properties that are extremely susceptible to vibration damage. Locations of historic properties can be found in the Historic Resources Report (VIA 2025). Further analysis at these historic properties would be required when the means and methods of construction has been established. Overall, building damage from construction vibration is not anticipated from the Project due to the type of construction and distances between the site and any nearest receivers; therefore, no mitigation is anticipated to be needed.

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1. INTRODUCTION

FTA has initiated NEPA compliance for the VIA ART East/West Corridor Project (the Project). On August 13, 2024, FTA issued an initial determination that NEPA class of action of the Project is a CE.

The Project is an approximately 7.3-mile bus rapid transit line within the City of San Antonio, Texas. The Project corridor would extend from General McMullen Drive in the west, through Downtown, to Coca Cola Place in the east, along the following roadways: Commerce Street, Buena Vista Street, Dolorosa Street, Market Street, Cherry Street, and East Houston Street (see Appendix A). The 7.3-mile segment defines the Project's capital limits, which represent the area where construction activities are planned. While the capital limits cover this 7.3-mile segment, bus rapid transit service is planned to extend beyond these limits. To the west, service would connect to the Kel-Lac Transit Center, and to the east, it would link to the future Eastside Transit Center. No construction activities are anticipated outside of the 7.3-mile capital limits. NEPA compliance will apply exclusively to this 7.3-mile segment defined by the capital limits.

The Project includes transit signal priority and is proposed to operate in a mixture of center dedicated lanes, curbside dedicated BAT lanes, and in mixed traffic. Based on the conceptual design, approximately 5.10 miles (70%) of the route would feature dedicated lanes, including 2.15 miles (30%) of center dedicated lanes and 2.95 miles (40%) of curbside dedicated BAT lanes. The remaining 2.20 miles (30%) would operate in mixed traffic.

Within the capital limits, the Project includes 18 new or modified station areas. Stations are planned to include amenities such as off-board fare collection, real-time arrival information, security cameras, lighting, and platforms for level boarding. In general, VIA plans to minimize significant ground disturbance or construction impacts in downtown by including stops with limited amenities. Sidewalk improvements are planned to provide pedestrian and Americans with Disabilities Act access to the transit stations.

The Project would include the procurement of low emission CNG vehicles to provide frequent service. Service would be provided seven days a week between 4:00 AM and 1:00 AM. On weekdays, trips will depart every 10 minutes from 6:00 AM to 9:00 PM and every 30 minutes at other times. On weekends, service will operate every 15 minutes from 6:00 AM to 7:00 PM and every 30 minutes at other times.

The purpose of this technical memorandum is to assess future noise and vibration effects on the surrounding land uses as a result of the construction and operations of the Project.

The guidance presented in the FTA Manual was used to predict and assess the potential noise and vibration effects of the operations of the Project. The potential effects of construction were assessed using the City of San Antonio Noise Ordinances.

2. NOISE AND VIBRATION BACKGROUND

2.1 Noise

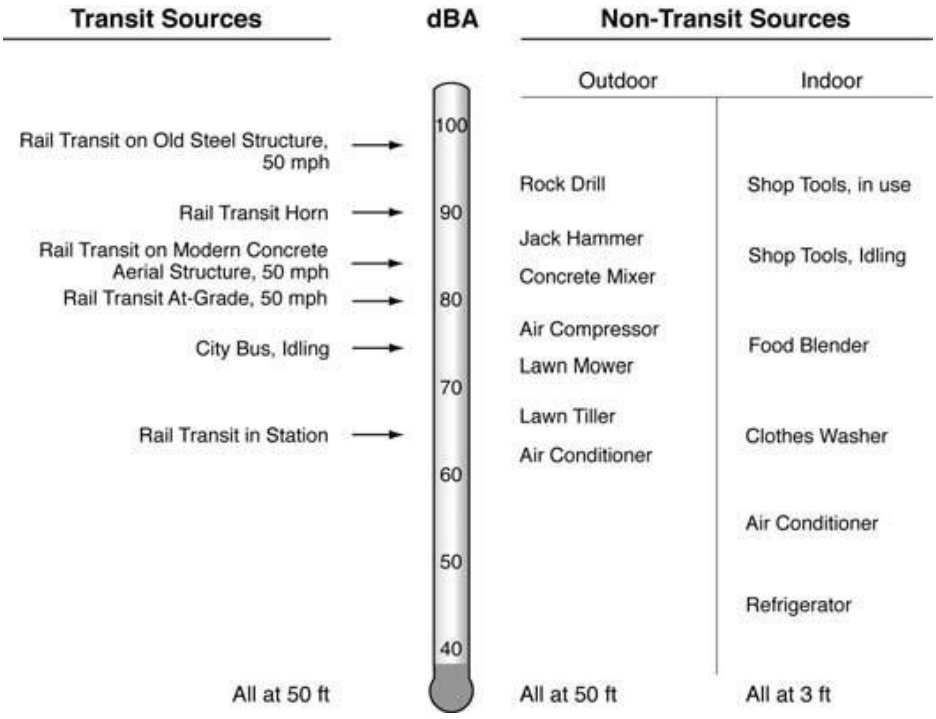
Noise is defined as unwanted sound; it is measured in terms of sound pressure level and is usually expressed in decibels (dB). The human ear is less sensitive to higher and lower frequencies than it is to midrange frequencies. To provide a measurement meaningful to humans, a weighting system was developed that reduces the sound level of higher and lower frequency sounds, similar to what the human ear does. This filtering system is used in virtually all noise ordinances. Measurements taken with this “A-weighted” filter are referred to as “dBA” readings.

The two primary noise measurement descriptors used to assess noise impacts from traffic and transit projects are the Leq, and the Ldn, which are defined as:

- Leq: The equivalent sound level (Leq) is the level of a constant sound for a specified period of time that has the same sound energy as an actual fluctuating noise over the same period of time. The peak-hour Leq is used for all traffic and transit noise analyses at locations with daytime use, such as schools and libraries.
- Ldn: The day-night sound level (Ldn) is a Leq over a 24-hour period, with 10 dBA added to nighttime sound levels (between 10 p.m. and 7 a.m.) as a penalty to account for the greater sensitivity and lower background sound levels during this time.

The Leq and Ldn is the primary noise-level descriptors for the assessment of FTA transit noise at sensitive noise receivers. Typical A-weighted sound levels are presented in Figure 1.

Figure 1: Typical A-weighted Sound Levels



Source: FTA Manual 2018

2.2 Vibration

FTA does not consider vibration impacts to result from rubber tires and suspension systems of transit vehicles. These vehicles provide vibration isolation; it is unusual for them to cause noticeable ground borne vibration or ground borne noise. With transit vehicle-related vibration, such as rattling of adjacent building windows that may be noticed by building occupants, the cause is almost always airborne noise and directly related to running surface conditions such as potholes, bumps, expansion joints, or other discontinuities in the road surface (usually resolved by smoothing the discontinuities). The two types of vibration impact that may occur when buses operate over poor road surface conditions are:

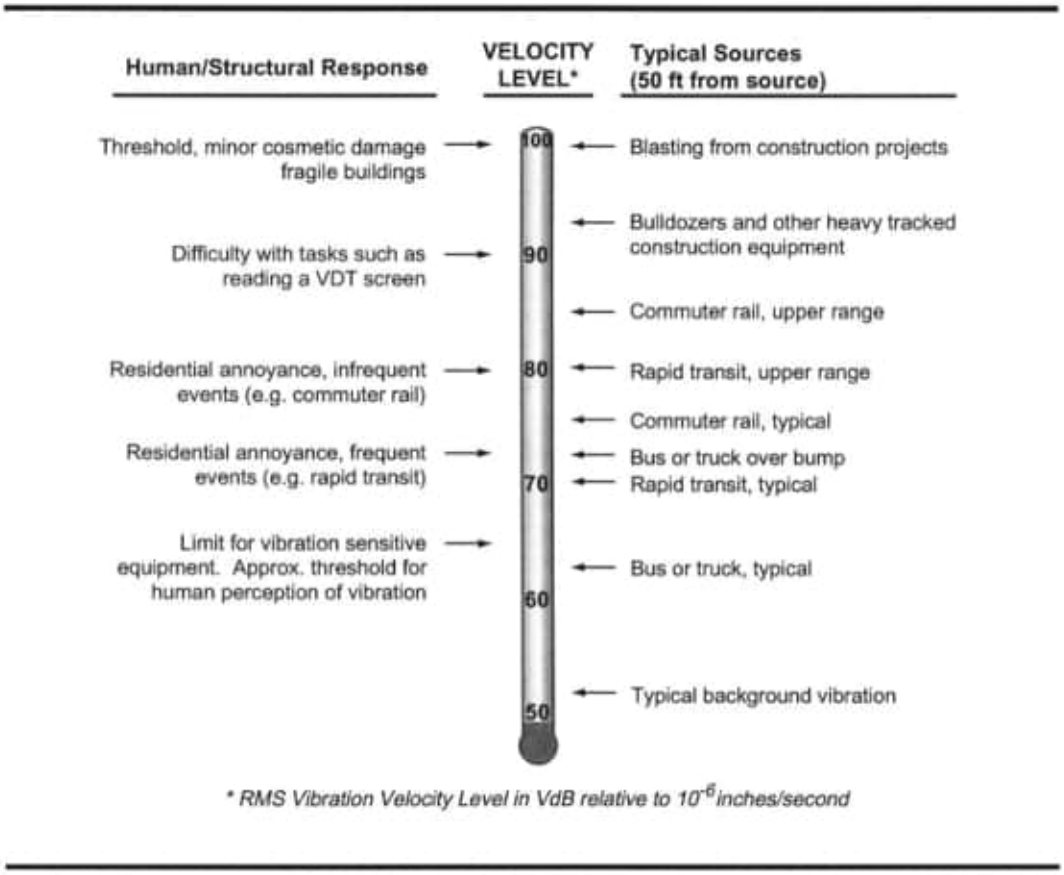
- Ground borne vibration: The movement of the ground (vibration can be experienced either outdoors or indoors)
- Ground borne noise: Noise generated by the movement of room surfaces, such as walls, resulting from vibration of a building (ground borne noise can only be experienced indoors)

Ground borne vibration can be described in terms of displacement, velocity, or acceleration when evaluating impacts from transit projects. Ground borne noise occurs as a perceptible

rumble and is caused by the noise radiated from the vibration of room surfaces. Vibration above certain levels can damage buildings, disrupt sensitive operations, and cause annoyance to humans within buildings. The response of humans, buildings, and equipment to vibration is most accurately described using velocity or acceleration. Vibration velocity is used by the FTA as the primary measurement to evaluate the effects of vibration.

Figure 2 illustrates typical ground borne vibration velocity levels for common sources, as well as thresholds for human and structural response to ground borne vibration. As shown, the range of interest is from approximately 50 vibration velocity decibels (VdB) to 100 VdB (i.e., from imperceptible background vibration to the threshold of damage to structures). Although the threshold of human perception to vibration is approximately 65 VdB, annoyance does not usually occur unless the vibration exceeds 70 VdB.

Figure 2: Typical Ground borne Vibration Levels



Source: FTA Manual 2018

3. REGULATORY REQUIREMENTS

3.1 Federal

FTA criteria were applied to the Project components. The FTA criteria found in the FTA Manual are the primary noise and vibration criteria by which transit-specific impacts are identified by FTA. The FTA guidance provides performance standards or thresholds for project elements where only transit would operate, including ART operations and associated ancillary and support elements, such as at stations, garages, park-and-ride lots, and transit centers.

3.2 Local

The local noise regulations that would apply to the Project is the City of San Antonio's noise ordinance, which outlines regulations to control construction noise. The City of San Antonio noise ordinance allows construction work on:

- Weekdays: 7 a.m. - 8 p.m.
- Saturdays: 8 a.m.- 8 p.m.
- Sundays: 9 a.m. - 5 p.m.

There are exceptions for pouring concrete and a limited amount of repair work on heavy machinery or construction equipment. Contractors can also apply for permission from the city to work outside of those hours, but they must inform nearby residents at least three days in advance. Multiple violations of the ordinance could result in the construction permit being suspended or even revoked. Under the previous ordinance, citations were the only penalty.

3.3 Other Requirements

3.3.1 Construction

3.3.1.1 Noise

Construction of the Project would require the use of heavy equipment that generates relatively high noise levels. FTA reference noise levels were used to predict construction noise levels for a variety of construction operations based on a compilation of empirical data and the application of acoustical propagation formulas. The FTA uses a database of noise levels for common pieces of construction equipment that would be expected to be used during construction of the Project (FTA 2018a). Variables that can be adjusted are distance from equipment to receiver, shielding, and equipment usage rates. Construction noise levels were assessed as they would

typically occur at the closest residential receivers. See Table 1 for typical construction noise levels.

Table 1: Typical Construction Equipment Noise Levels

Equipment	Typical noise level 50 ft from source, dBA
Air Compressor	80
Backhoe	80
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Mobile	83
Dozer	85
Generator	82
Grader	85
Loader	80
Paver	85
Pile Driving	101
Pneumatic Tool	85
Pump	77
Roller	85
Saw	76
Scarifier	83
Scraper	85
Shovel	82
Truck	84

Source: FTA Manual 2018

3.3.1.2 Vibration

Construction vibration was analyzed to evaluate the potential for damage to structures. Annoyance from ground borne noise and vibration is generally not an issue because of the short-term duration of most construction activities and is not included in this assessment. To evaluate potential vibration effects during construction, the FTA's recommendation on damage risk vibration levels was used because there are no state, county, or city vibration regulations.

The parameter normally used to assess potential construction vibration effects to structures is the peak particle velocity (PPV), which is the maximum velocity recorded during a particular event, such as from a jackhammer. The FTA's recommended limits for construction vibration for four building categories are as follows:

- Reinforce concrete, steel, or timber: 0.5 inch per second (in./sec) PPV
- Engineered concrete and masonry: 0.3 in./sec PPV
- Nonengineered timber and masonry buildings: 0.2 in./sec PPV
- Buildings extremely susceptible to vibration damage: 0.12 in./sec PPV

3.3.2 Operations

3.3.2.1 Noise

Existing measured noise levels were used to predict the Ldn and peak-hour Leq for receivers used in the noise and vibration analysis. The Ldn is a 24-hour energy average noise level used to determine impacts where nighttime sensitive land use exists, such as residences, hotels and motels, and hospitals. The peak-hour Leq is used to determine noise impacts for institutional land use, such as schools, libraries, or churches. All noise levels are A-weighted to account for the hearing response of humans and referred to as sound levels in decibels (dBA).

The criteria in the FTA Manual are founded on well-documented research on community reaction to noise and are based on changes in noise exposure using a sliding scale. The amount of change in the overall noise environment that the transit project is allowed to make is reduced with increasing levels of existing noise. The FTA noise impact criteria group noise-sensitive land uses into the following three categories:

- Category 1: Tracts of land where quiet is an essential element in their intended purposes. This category includes lands set aside for serenity and quiet, and such land uses as outdoor amphitheaters and concert pavilions, as well as National Historic Landmarks with significant outdoor use. Also included are recording studios and concert halls.
- Category 2: Residences and buildings where people normally sleep. This category includes residences, hospitals, and hotels where nighttime sensitivity is assumed to be of utmost importance.
- Category 3: Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, theaters, and churches where it is important to avoid interference with such activities as speech, meditation, and concentration on reading material. Places for meditation or study associated with cemeteries, monuments, museums, campgrounds, and recreational facilities may also be considered to be in this category. Certain historical sites and parks are also included.

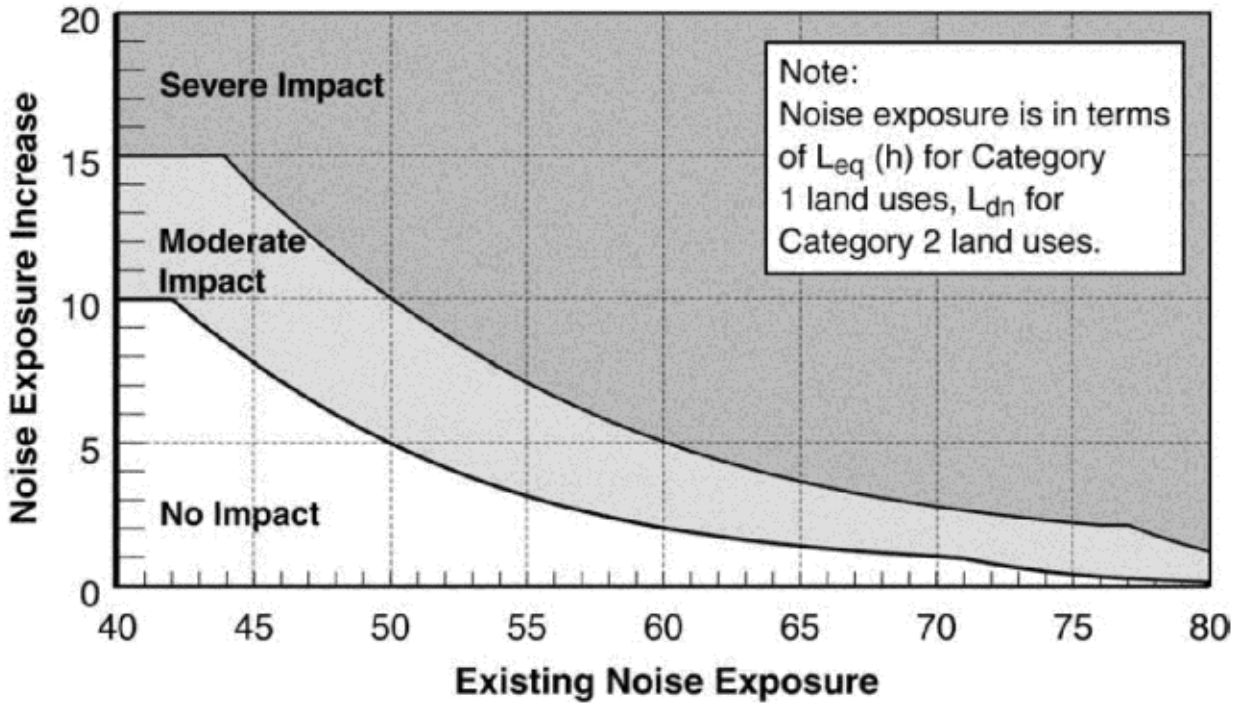
The Ldn is used to characterize noise exposure for residential areas (Category 2), and the peak 1-hour Leq is used to evaluate effects from other noise-sensitive land uses such as schools, libraries, and other noise-sensitive daytime uses (Categories 1 and 3) during project operation. There are no FTA impact criteria for commercial uses, such as offices, retail, or restaurants.

Two levels of impact are included in the FTA criteria. The interpretations of these two levels of impact are summarized as:

- Severe: Project-generated noise in this range is likely to cause a high level of community annoyance. Noise mitigation must be considered for severe impacts unless extenuating circumstances prevent mitigation.
- Moderate: Project-generated noise in this range is considered to cause impact at the threshold of measurable annoyance. Mitigation should be considered at this level of impact based on project specifics and details concerning the affected properties.

Note that both Severe and Moderate impacts are mitigated unless there is no reasonable or feasible mitigation. The FTA noise impact criteria are provided in Figure 3, which shows the existing noise exposure and the noise exposure increase that would result in either a moderate or severe impact. The future noise exposure, which is not shown in Figure 3, would be the combination of the existing noise exposure and the additional noise exposure caused by the Project.

Figure 3: FTA Noise Impact Criteria



Source: FTA Manual 2018

A noise impact assessment was conducted using the FTA General Noise Assessment procedures described in Section 4.4 of the FTA Manual. The methodology for assessing noise impact from the ART operations included the following steps:

- Identify noise-sensitive land uses along the Project corridor using aerial photography, site reconnaissance, and GIS data GIS data from the Bexar County Appraisal District., typically within a distance of up to 500 feet from the proposed alignment (based on the FTA noise impact screening distance for busways where the sound path is unobstructed)
- Measure or estimate existing noise levels in the corridor near sensitive receivers (see Section 4.1).
- Predict future Project noise levels from transit operations, using preliminary engineering plans and information on speeds, headways, and vehicle type.
- Assess the impact of the Project by comparing the predicted future noise levels with existing noise levels using the FTA noise impact criteria as shown in Figure 3.

- Recommend mitigation at locations where predicted future noise levels exceed the FTA impact criteria.

Project noise levels from ART operations are based on source references levels found in Section 4.4 General Noise Assessment of the FTA Manual and the current design of the Project. This information was used to predict noise levels at sensitive locations from the proposed alignment. Specific inputs used in the noise impact assessment include the following:

- Location of the noise sensitive receivers in relation to the bus lane, including the distance between the bus lane and sensitive receivers and relative elevations
- A source reference noise level for electric buses of 80 dBA Sound Exposure Level (SEL) at 50 feet at 50 mph
- A bus speed of 30 mph along the ART route
- ART buses operating between 4:00 AM to 1:00 AM on weekdays with a headway of 10 minutes along the route between 6:00 AM to 9:00 PM and a headway of 30 minutes at other times

3.3.2.2 Vibration

Since there are no ground borne vibration impacts expected from the operation of the Project, the FTA Vibration Assessment would not apply to the Project.

4. AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS

4.1 Noise Measurement Sites

This section summarizes land uses along the Project corridor that are sensitive to noise and vibration, based on existing noise level measurements. These sensitive land uses were identified through site reconnaissance, aerial maps, and GIS data from the Bexar County Appraisal District.

Land uses along the Project corridor include commercial, residential, educational, governmental, recreational, religious, social, cultural, and transportation. Both east and west segments of the Project consist largely of medium-density residential with commercial properties along Commerce Street and Houston Street. The downtown segment of the Project consists largely of medium- to high-density commercial uses mixed with educational, governmental, religious, and recreational uses.

Twenty-four noise measurement locations were selected to represent existing noise levels at the nearest noise-sensitive receivers to the Project (see Page 15, Figure 4). All measurement sites are situated within the east and west segments of the Project alignment. Noise measurements were not conducted in the downtown area, as there are no noise-sensitive outdoor land uses in that portion of the Project corridor. Appendix A provides specific locations of the noise measurements. The noise measurements were conducted at these 24 locations during the week of October 21st, 2024, as detailed in Table 2 (See Page 16, Table 2).

Site 1: 4445 West Commerce Street

This measurement site represents outdoor dining areas at commercial properties between General McMullen Drive to Matyear Street. Most properties adjacent to Commerce Street in this area are commercial, retail and light industrial uses. There are no residential properties that are adjacent to Commerce Street within this area. The measurement was taken near the property line, in front of the Wendy's Restaurant, on the north side of Commerce Street.

Site 2: 4243 West Commerce Street

This measurement site represents residential properties between Matyear Street and NW 24th Street. Most properties adjacent to Commerce Street in this area are commercial and retail uses. The main residential property in this area is the Lago Vista Apartments (multi-family residential units). The measurement was taken near the fence line along the north side of Commerce Street.

Site 3: 3501 Buena Vista Street (Elmdorf Lake Park)

This measurement site represents residential properties between NW 24th Street and NW 20th Street. Most properties adjacent to Commerce/Buena Vista Street in this area are commercial, retail, and residential uses. The measurement was taken near the sidewalk along the south side of Buena Vista Street.

Site 4: 207 SW 19th Street

This measurement site represents residential properties between NW 20th Street and S Minter Street. The majority of the properties adjacent to Buena Vista Street in this area are residential uses. The measurement was taken near the sidewalk, along the southwest side of the SW 19th Street and Buena Vista Steet intersection

Site 5: 3114 Buena Vista Street

This measurement site represents residential properties between S Minter Street and S Hamilton Avenue. The majority of the properties adjacent to Buena Vista Street in this area are

residential uses. The measurement was taken near the sidewalk along the south side of Buena Vista Steet.

Site 6: 2702 Buena Vista Street

This measurement site represents residential properties between S Hamilton Avenue and S Zarzamora Street. The majority of the properties adjacent to Buena Vista Street in this area are residential uses. The measurement was taken near the sidewalk along the south side of Buena Vista Steet.

Site 7: 3431 W Commerce Street

This measurement site represents residential properties between NW 21st Street and N Minter Street. Most of the properties adjacent to Commerce Street in this area are a mix of commercial and residential uses. The measurement was taken near the sidewalk along the north side of Commerce Steet.

Site 8: 3330 W Commerce Street

This measurement site represents residential properties between N Minter Street and N Hamilton Street. Most of the properties adjacent to Commerce Street in this area are a mix of commercial and residential uses. The measurement was taken near the sidewalk along the south side of Commerce Steet.

Site 9: 3005 W Commerce Street

This measurement site represents residential properties between N Hamilton Street and N Zarzamora Street. Most of the properties adjacent to Commerce Street in this area are commercial and residential uses. The measurement was taken near the sidewalk along the north side of Commerce Steet.

Site 10: 2410 Buena Vista Street

This measurement site represents residential properties between S Zarzamora Street and S Navidad Street. Most properties adjacent to Buena Vista Street in this area are commercial and residential uses. The measurement was taken near the sidewalk along the south side of Buena Vista Steet.

Site 11: 1920 Buena Vista Street

This measurement site represents residential properties between S Navidad Street and S Trinity Street. Most properties adjacent to Buena Vista Street in this area are commercial and

residential uses. The measurement was taken near the sidewalk along the south side of Buena Vista Steet.

Site 12: 1422 Buena Vista Street

This measurement site represents residential properties between S Trinity Street and S Brazos Street. Most properties adjacent to Buena Vista Street in this area are commercial and residential uses. The measurement was taken near the sidewalk along the southeast corner of Buena Vista Steet and N Las Moras Street.

Site 13: 2523 W Commerce Street

This measurement site represents residential properties between N Zarzamora Street and N Sabinas Street. Most properties adjacent to Commerce Street in this area are commercial and residential uses. The measurement was taken near the sidewalk along the northeast corner of Commerce Steet and N Chupaderas Street.

Site 14: 2015 W Commerce Street

This measurement site represents residential properties between N Sabinas Street and N Los Moras Street. Most properties adjacent to Commerce Street in this area are commercial and residential uses. The measurement was taken near the sidewalk along the northeast corner of Commerce Steet and N Trinity Street.

Site 15: 1213 Buena Vista Street

This measurement site represents residential properties between N Brazos Street and S Colorado Street. Most properties adjacent to Buena Vista Street in this area are commercial and residential uses. The measurement was taken near the sidewalk along the north side of Buena Vista Steet.

Site 16: 1102 Buena Vista Street

This measurement site represents residential properties between S Colorado Street and S Salado Street. Most of the properties adjacent to Buena Vista Street in this area are commercial and residential uses. The measurement was taken near the sidewalk along the south side of Buena Vista Steet.

Site 17: 1406 W Commerce Street

This measurement site represents residential properties between N Los Moras Street and S Salado Street. Most of the properties adjacent to Commerce Street in this area are commercial

and residential uses. The measurement was taken near the sidewalk along the south side of Commerce Steet.

Site 18: 1174 E Commerce Street

This measurement site represents residential properties between I-37 and S Houston Street. Most of the properties adjacent to Commerce Street in this area are commercial and residential uses. The measurement was taken near the sidewalk along the south side of Commerce Steet.

Site 19: 1602 E Houston Street

This measurement site represents residential properties between N Cherry Street and N Monumental. Most properties adjacent to E Houston Street in this area are commercial, retail and residential uses. The measurement was taken near the sidewalk along the south side of E Houston Steet.

Site 20: 1934 E Houston Street

This measurement site represents residential properties between N Monumental to N New Braunfels Avenue. Most properties adjacent to E Houston Street in this area are commercial, retail and residential uses. The measurement was taken near the sidewalk along the southwest corner of E Houston Steet and N Palmetto Street.

Site 21: 2246 E Houston Street

This measurement site represents residential properties between N New Braunfels Avenue to N Gevers Street. Most of the properties adjacent to E Houston Street in this area are commercial and residential uses. The measurement was taken near the sidewalk along the south side of E Houston Steet.

Site 22: 2246 E Houston Street

This measurement site represents residential properties between N Gevers Street to N Walters Street. Most of the properties adjacent to E Houston Street in this area are commercial and residential uses. The measurement was taken near the sidewalk along the north side of E Houston Steet.

Site 23: 2606 E Houston Street

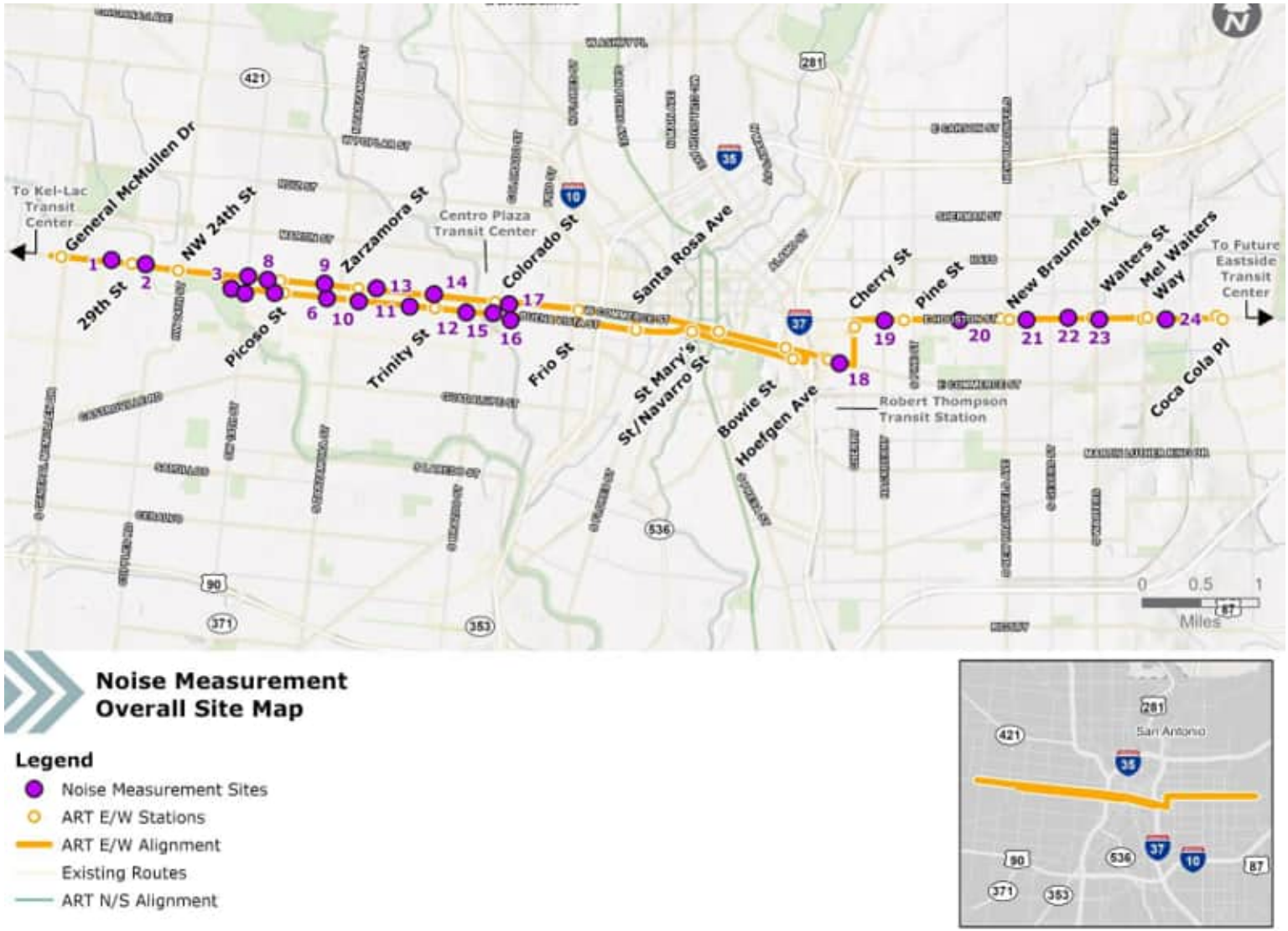
This measurement site represents residential properties between N Walters Street to Mel Waiters Way. Most properties adjacent to E Houston Street in this area are commercial and residential uses. The measurement was taken near the sidewalk along the south side of E Houston Steet.

Site 24: 2900 E Houston Street

This measurement site represents residential properties between Mel Waiters Way to Coca Cola Place. Most properties adjacent to E Houston Street in this area are commercial and residential uses. The measurement was taken near the sidewalk, along the south side of E Houston Steet.

The results of the existing 24-hour noise measurements are presented in Table 2.

Figure 4: 24-Hour Noise Measurement Locations



Source: VIA ART East/West Corridor Project, 2025

Table 2: 24-Hour Existing Noise-Level Measurements

Site	Location	FTA Land Use Category	Ldn dBA	Peak-Hour Leq (h), dBA	Time of Peak Hour	Date of Measurement
1	Wendy's 4445 W Commerce Street	3	74.3*	74.3	9:00 AM	10/21/2024
2	Lago Vista Apartments 4243 W Commerce Street	2	67.7	66.8	6:00 PM	10/21/2024
3	Park (SFR) - 3501 Buena Vista Street	3	76.1*	76.1	8:00 AM	10/21/2024
4	207 SW 19th Street	2	75.4	81.2	8:00 AM	10/22/2024
5	3114 Buena Vista St	2	70.0	70.8	7:00 AM	10/22/2024
6	2702 Buena Vista Street	2	68.9	69.7	7:00 AM	10/22/2024
7	3431 W Comerce Street	2	69.8	70.7	6:00 PM	10/22/2024
8	3330 W Comerce Street	2	68.8	70.8	5:00 PM	10/22/2024
9	3005 W Commerce Street	2	69.6	73.9	5:00 PM	10/22/2024
10	2410 Buena Vista Street	2	67.6	68.0	7:00 AM	10/22/2024
11	1920 Buena Vista Street	2	66.0	65.8	8:00 AM	10/22/2024
12	1422 Buena Vista Street	2	66.2	66.9	7:00 AM	10/23/2024
13	2523 W Commerce Street	2	69.3	73.3	7:00 AM	10/21/2024
14	2015 W Commerce Street	2	67.0	69.1	6:00 PM	10/21/2024
15	1213 Buena Vista Street	2	68.3	68.4	7:00 AM	10/23/2024
16	1102 Buena Vista Street	2	72.1	71.9	8:00 AM	10/21/2024
17	1406 W Commerce Street	2	67.8	68.2	11:00 AM	10/23/2024
18	1174 E Commerce Street	2	71.2	73.4	6:00 AM	10/21/2024
19	1602 E Houston Street	2	68.2	75.9	5:00 PM	10/22/2024
20	1934 E Houston Street	2	64.8	72.1	2:00 PM	10/22/2024
21	2246 E Houston Street	2	66.1	69.8	5:00 PM	10/21/2024
22	2443 E Houston Street	2	69.4	70.6	9:00 AM	10/23/2024
23	2606 E Houston Street	2	69.9	69.0	11:00 PM	10/23/2024
24	2900 E Houston Street	2	64.8	65.8	10:00 AM	10/23/2024

*Peak Hour Leq used for FTA land use Category 3

Source: VIA ART East/West Corridor Project, 2025

4.2 Operations

4.2.1 Noise

The predicted future noise levels resulting from the operation of the Project are presented in Table 3. No noise impacts are predicted as a result of the Project.

Table 3: Predicted Project Future Noise Levels by Horizon Year (2039)

Site	Location	Land Use	Existing Noise Level Ldn, dBA	Project Build Noise Level Ldn, dBA	Total Future Build Noise Levels Ldn, dBA	FTA Impact Threshold
1	Wendy's 4445 W Commerce Street	Commercial	74.3*	47.4	74.3	None
2	Lago Vista Apartments 4243 W Commerce Street	Residential	67.7	48.7	67.7	None
3	Park (SFR) - 3501 Buena Vista Street	Commercial	76.1*	53.9	76.1	None
4	207 SW 19th Street	Residential	75.4	57.9	75.4	None
5	3114 Buena Vista St	Residential	70.0	58.2	70.0	None
6	2702 Buena Vista Street	Residential	68.9	58.2	68.9	None
7	3431 W Commerce Street	Residential	69.8	56.3	69.8	None
8	3330 W Commerce Street	Residential	68.8	58.2	68.8	None
9	3005 W Commerce Street	Residential	69.6	59.2	69.6	None
10	2410 Buena Vista Street	Residential	67.6	55.5	67.6	None
11	1920 Buena Vista Street	Residential	66.0	53.2	66.0	None
12	1422 Buena Vista Street	Residential	66.2	54.5	66.2	None
13	2523 W Commerce Street	Residential	69.3	55.9	69.3	None
14	2015 W Commerce Street	Residential	67.0	55.9	67.0	None
15	1213 Buena Vista Street	Residential	68.3	55.7	68.3	None
16	1102 Buena Vista Street	Residential	72.1	56.1	72.1	None
17	1406 W Commerce Street	Residential	67.8	54.8	67.8	None
18	1174 E Commerce Street	Residential	71.2	46.4	71.2	None
19	1602 E Houston Street	Residential	68.2	57.0	68.2	None
20	1934 E Houston Street	Residential	64.8	58.5	64.8	None
21	2246 E Houston Street	Residential	66.1	58.5	66.1	None
22	2443 E Houston Street	Residential	69.4	56.3	69.4	None
23	2606 E Houston Street	Residential	69.9	59.2	69.9	None
24	2900 E Houston Street	Residential	64.8	56.8	64.8	None

*Peak Hour Leq used for FTA land use Category 3

Source: VIA ART East/West Corridor Project, 2025

4.2.2 Vibration

Existing and future vehicle vibration generated by the proposed project are not anticipated to generate perceptible levels of vibration at surrounding land uses. As such, no vibration impacts are anticipated during operation of the project.

4.2.3 Cumulative Noise

VIA currently operates both local and commuter bus services within the Project area. Additionally, VIA is developing the Better Bus Plan to optimize service coverage and improve efficiency across its service area. With the implementation of the Project and the Better Bus Plan, service integration is expected, potentially leading to modifications of existing bus routes to eliminate redundancy. The cumulative noise levels from future bus operations after service integration, including modified bus service and ART operations, is anticipated to be similar to current noise levels.

4.3 Construction

4.3.1 Noise

Construction of the Project would require the use of heavy equipment that generates relatively high noise levels. The noise levels generated by construction equipment vary greatly on factors such as the type of equipment, the equipment model, the operation being performed, and the condition of the equipment.

The Project construction noise would be temporary and intermittent and would cease once construction is complete. All construction activities would be carried out in compliance with specifications and the applicable noise limits of the City of San Antonio Code of Ordinances.

4.3.2 Vibration

The damage to structures is a potential vibration impact. Annoyance from ground borne vibration is generally not an issue because of the short-term duration of most construction activities and is not included in this assessment.

Construction of the project could result in temporary vibration from the use of heavy equipment and machinery. Pile driving, which could produce the highest levels of vibration at sensitive receivers, is not anticipated to occur during construction. Annoyance from ground borne noise and vibration is generally not an issue because of the short-term duration of most construction activities, and the main concern is potential damage to buildings. It is not expected that the construction of the Project would result in ground borne vibration levels of 0.3 in./sec PPV or

greater, resulting in a potential damage risk to the buildings along the corridor. The exception would be historic properties that are extremely susceptible to vibration damage. Locations of these properties can be found in the **Historic Resources Report (VIA 2025)**. Further analysis at these historic properties would be required when the means and methods of construction has been established.

5. MITIGATION MEASURES

5.1 Operations Mitigation

The Project is predicted to have no noise impacts from operations of the ART service. Therefore, noise mitigation measures would not be required.

Additionally, since no vibration impacts are anticipated due to the operations of the Project, no operations mitigation is proposed for the Project.

5.2 Construction Mitigation

5.2.1 Noise

The following mitigation effort is proposed for potential noise-related construction impacts.

The contractor would develop a Noise Control Plan demonstrating how the construction noise limits set by the City of San Antonio's ordinance can be achieved. The Noise Control Plan must be approved by VIA prior to the start of construction. If construction is planned during nighttime hours from 10:00 p.m. and 7:00 a.m., Sundays or legal holidays, the contractor would need to obtain a noise variance. Construction noise-reducing methods that may be implemented, as necessary, include the following:

- Use low-noise emission equipment
- Use broadband backup warning devices on all vehicles
- Implement noise-deadening measures for truck loading and operations
- Conduct monitoring and maintenance of equipment to meet noise limits
- Use acoustic enclosures, shields, or shrouds for equipment and facilities
- Install high-grade engine exhaust silencers and engine-casing sound insulation
- Minimize the use of generators
- Use movable noise barriers at the source of the construction activity

5.2.2 Vibration

Building damage from construction vibration is not anticipated from the Project due to the type of construction and distances between the site and any nearest receivers; therefore, no mitigation is anticipated to be needed.

6. REFERENCES

VIA 2022 Advanced Rapid Transit East/West Corridor Project Service Plan and Operating Cost Estimates.

Federal Transit Administration (FTA). 2018a. *Transit Noise and Vibration Impact Assessment Manual*. Retrieved from https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf. Accessed December 2024 and January 2025.

Federal Transit Administration (FTA). 2018b. Noise Impact Assessment Spreadsheet. Retrieved from https://www.transit.dot.gov/regulations-and-guidance/environmental-programs/noise-impact-assessment-spreadsheet. Accessed December 2024 and January 2025.

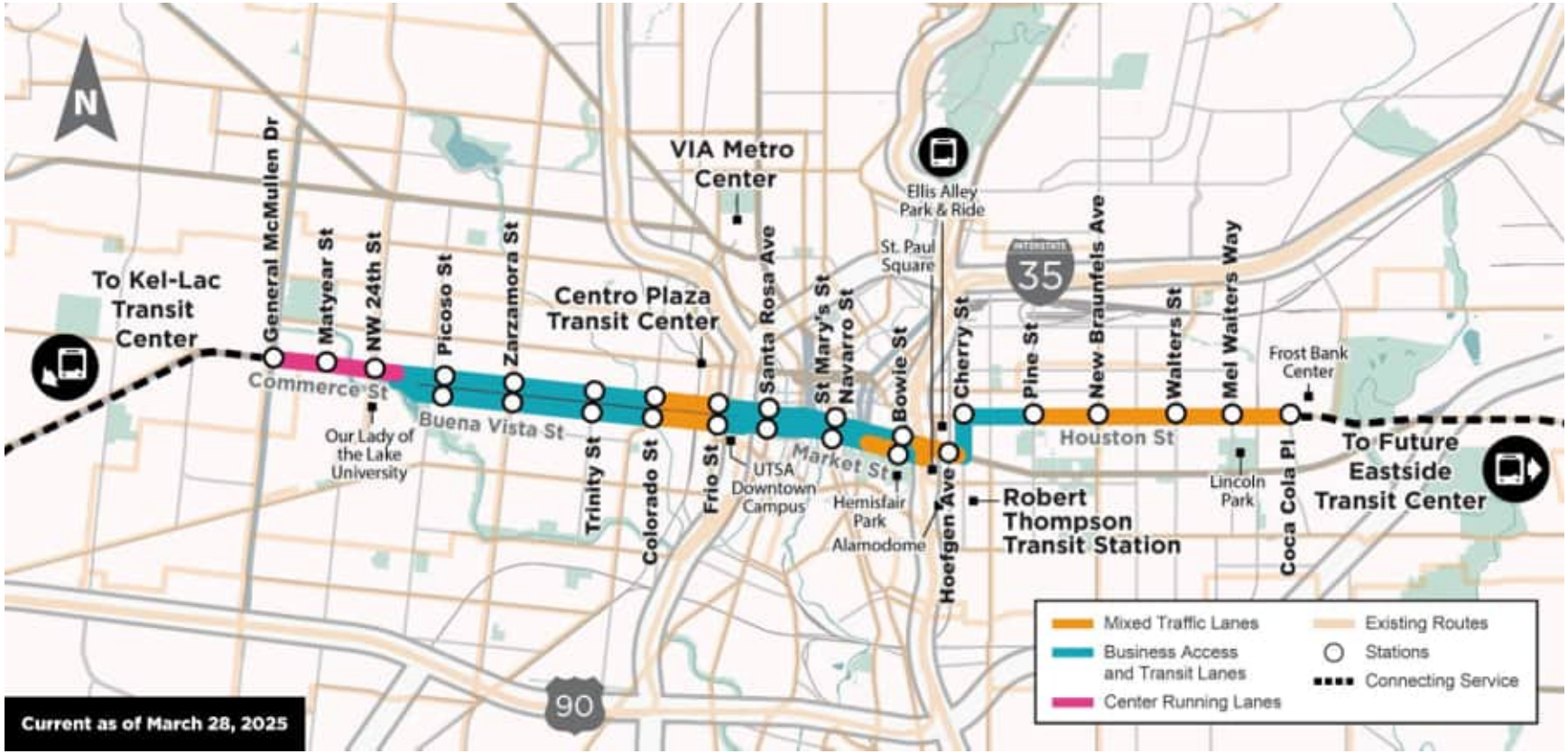
City of San Antonio Noise Ordinances. 2021. https://library.municode.com/tx/san_antonio/codes/code_of_ordinances?nodeId=PTIICO_CH21OFMIPR_ARTIIINO. Accessed December 2024 and January 2025

VIA Better Bus Plan. 2025 https://keepsamoving.com/projects/better-bus/. Accessed December 2024 and January 2025

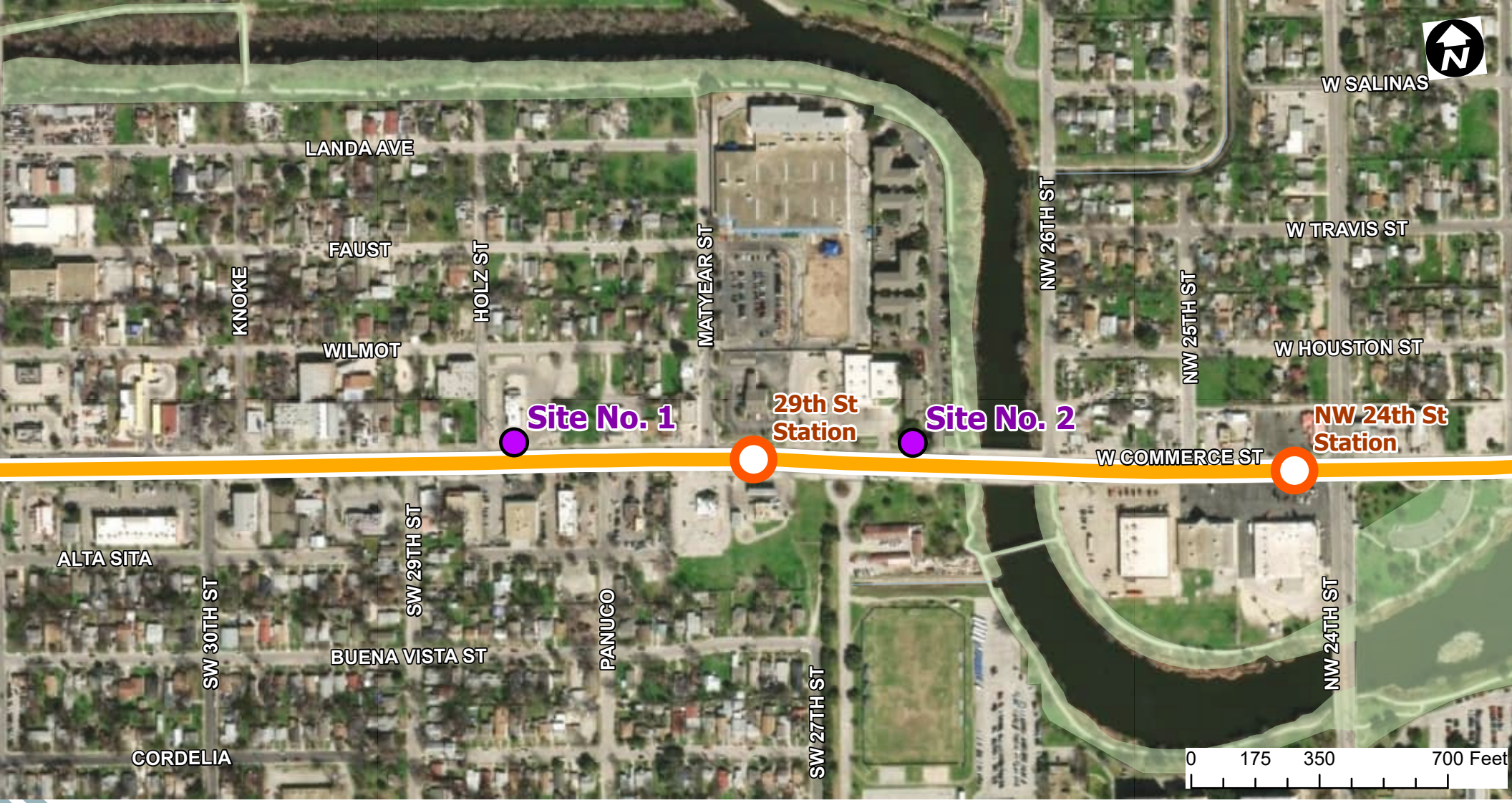
7. ACRONYMS

Acronym/Abbreviation	Definition
ART	Advanced Rapid Transit
CNG	Compressed Natural Gas
CFR	Code of Federal Regulations
dB	Decibel
dBA	A-weighted decibel
FTA	Federal Transit Administration
GIS	Geographic Information System
in/sec	Inches Per Second
L_{dn}	Day/Night Sound Level
L_{eq}	Equivalent Noise Level
L_{max}	Maximum Noise Level
mph	Miles Per Hour
N/S	North/South
E/W	East/West
NEPA	National Environmental Policy Act
PPV	Peak Particle Velocity
ROW	Right-of-Way
SR	State Route
SEL	Sound Exposure Level
TNM	Traffic Noise Model
VdB	Decibel Notation
VIA	VIA Metropolitan Transit

APPENDIX A: Project Map


N
To Kel-Lac Transit Center
General McMullen Dr
Matyear St
NW 24th St
Picoso St
Zarzamora St
Commerce St
Buena Vista St
Our Lady of the Lake University
Centro Plaza Transit Center
Trinity St
Colorado St
VIA Metro Center
Frio St
Santa Rosa Ave
UTSA Downtown Campus
St Mary's St
Navarro St
Market St
Hemisfair Park
Alamodome
Ellis Alley Park & Ride
Bowie St
Hoefgen Ave
St. Paul Square
Cherry St
35
Pine St
New Braunfels Ave
Houston St
Walters St
Mel Waiters Way
Lincoln Park
Frost Bank Center
Coca Cola Pl
To Future Eastside Transit Center
Robert Thompson Transit Station
90
Mixed Traffic Lanes
Business Access and Transit Lanes
Center Running Lanes
Existing Routes
Stations
Connecting Service
Current as of March 28, 2025

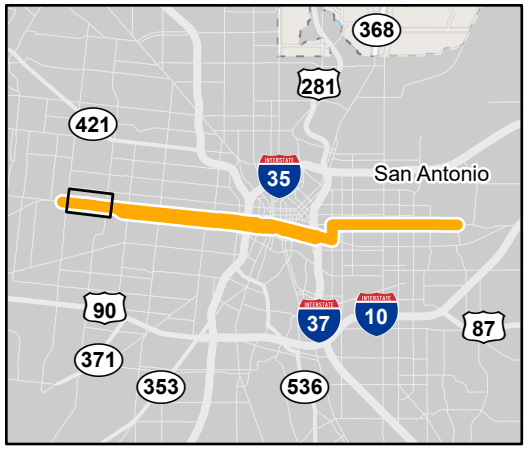
APPENDIX B: Noise Measurements Site Maps and Descriptions



Noise Measurement Sites

Legend

- ART E/W Alignment
- ART E/W Stations
- Noise Measurement Sites



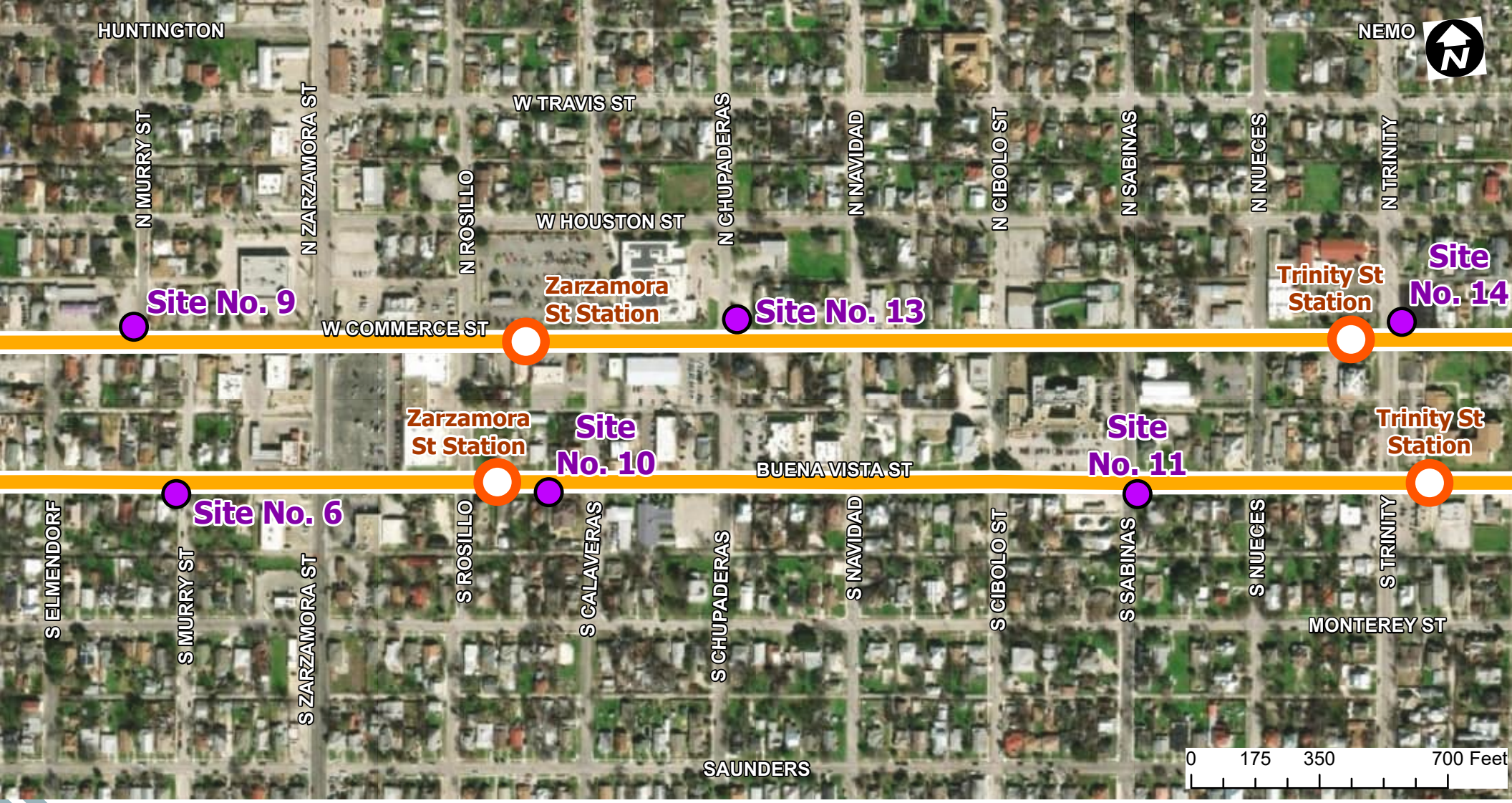
Sources: WSP

Noise Measurement Sites

Legend

- ART E/W Alignment
- ART E/W Stations
- Noise Measurement Sites

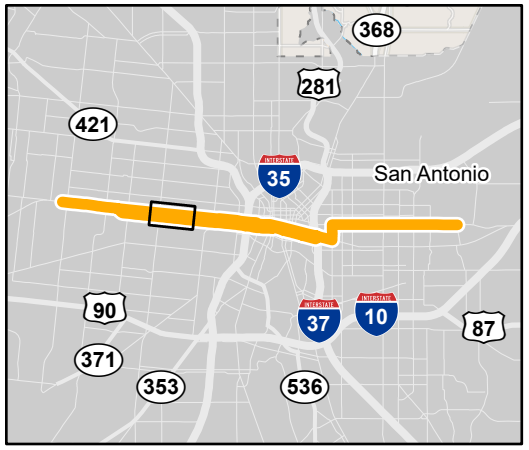
Sources: WSP



Noise Measurement Sites

Legend

- ART E/W Alignment
- ART E/W Stations
- Noise Measurement Sites

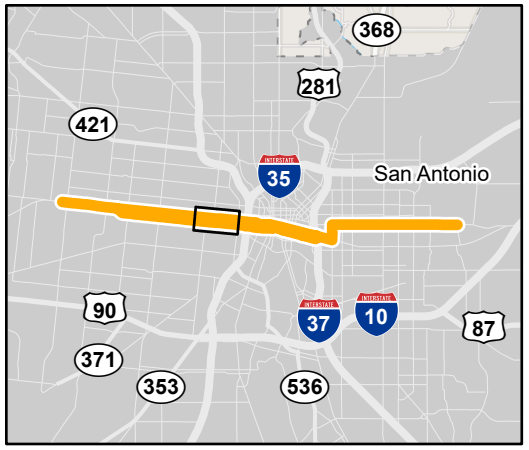


Sources: WSP

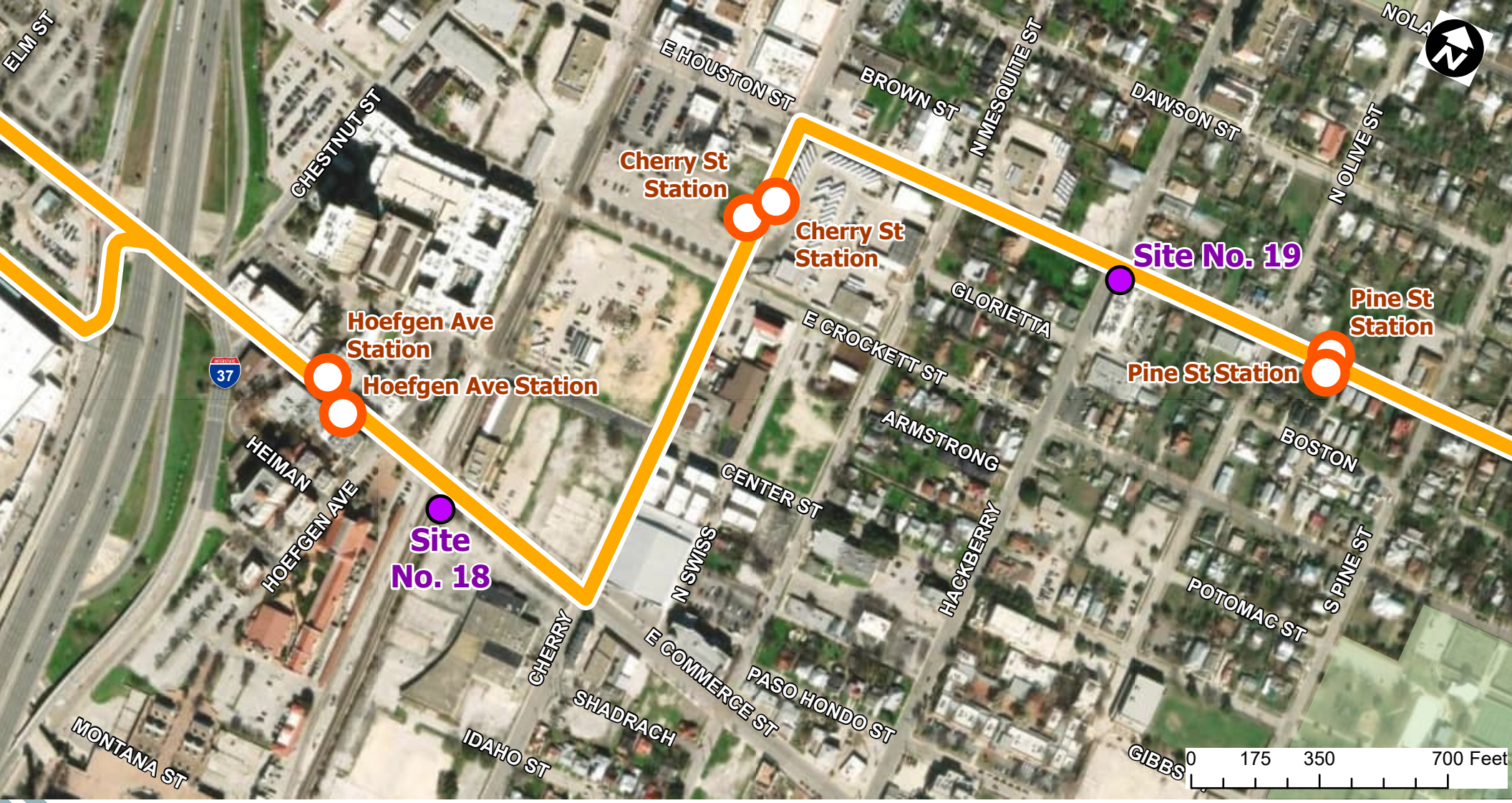
Noise Measurement Sites

Legend

- ART E/W Alignment
- ART E/W Stations
- Noise Measurement Sites



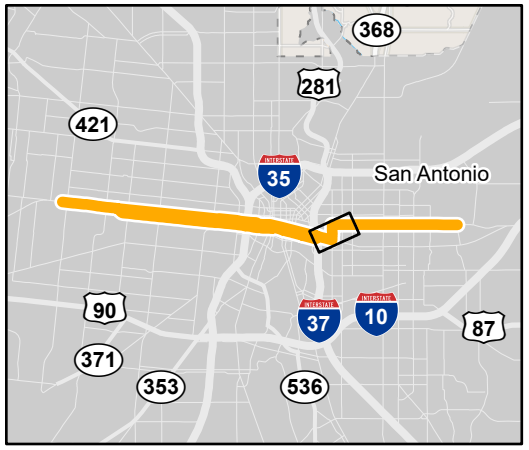
Sources: WSP



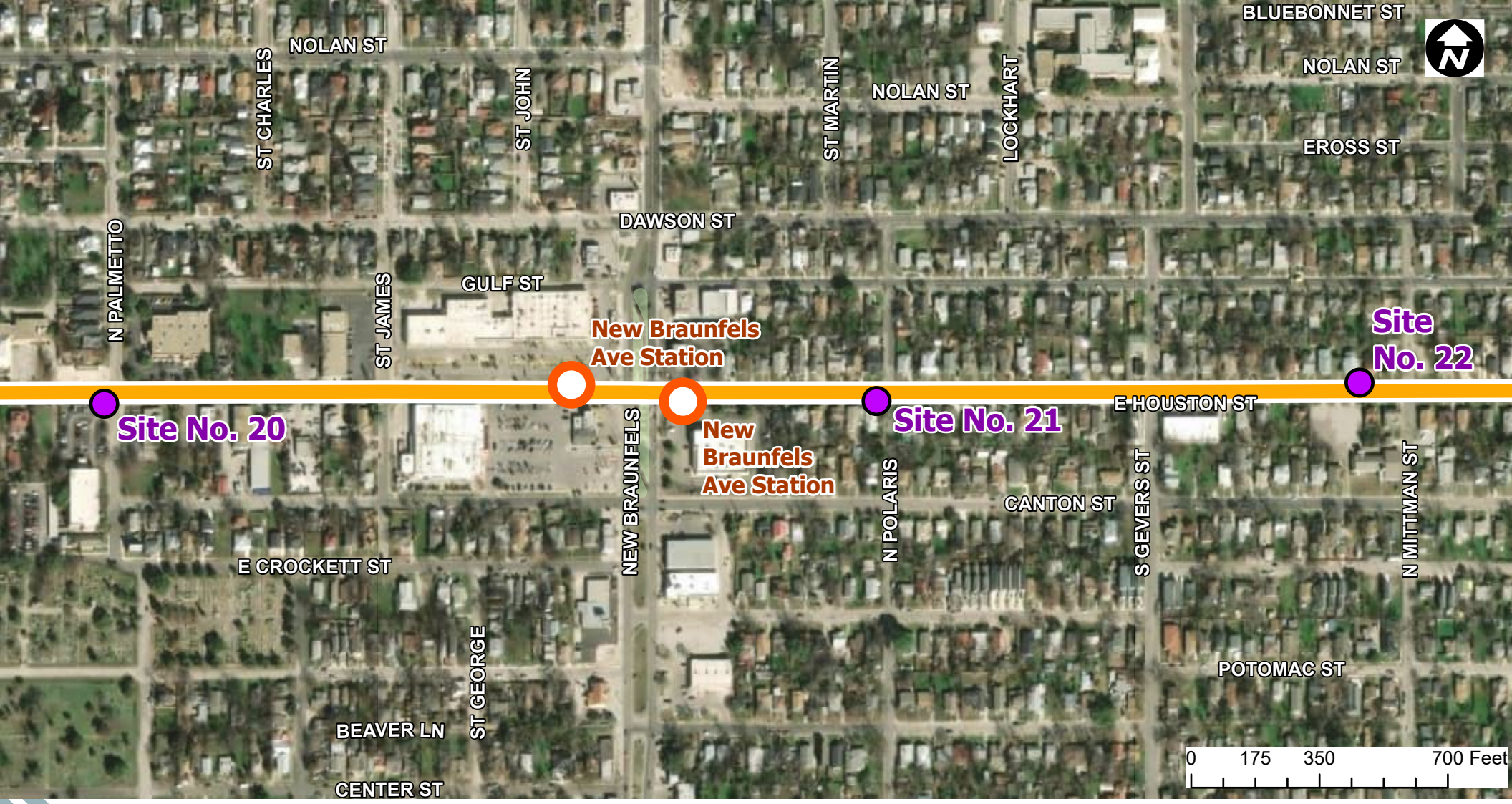
Noise Measurement Sites

Legend

- ART E/W Alignment
- ART E/W Stations
- Noise Measurement Sites



Sources: WSP

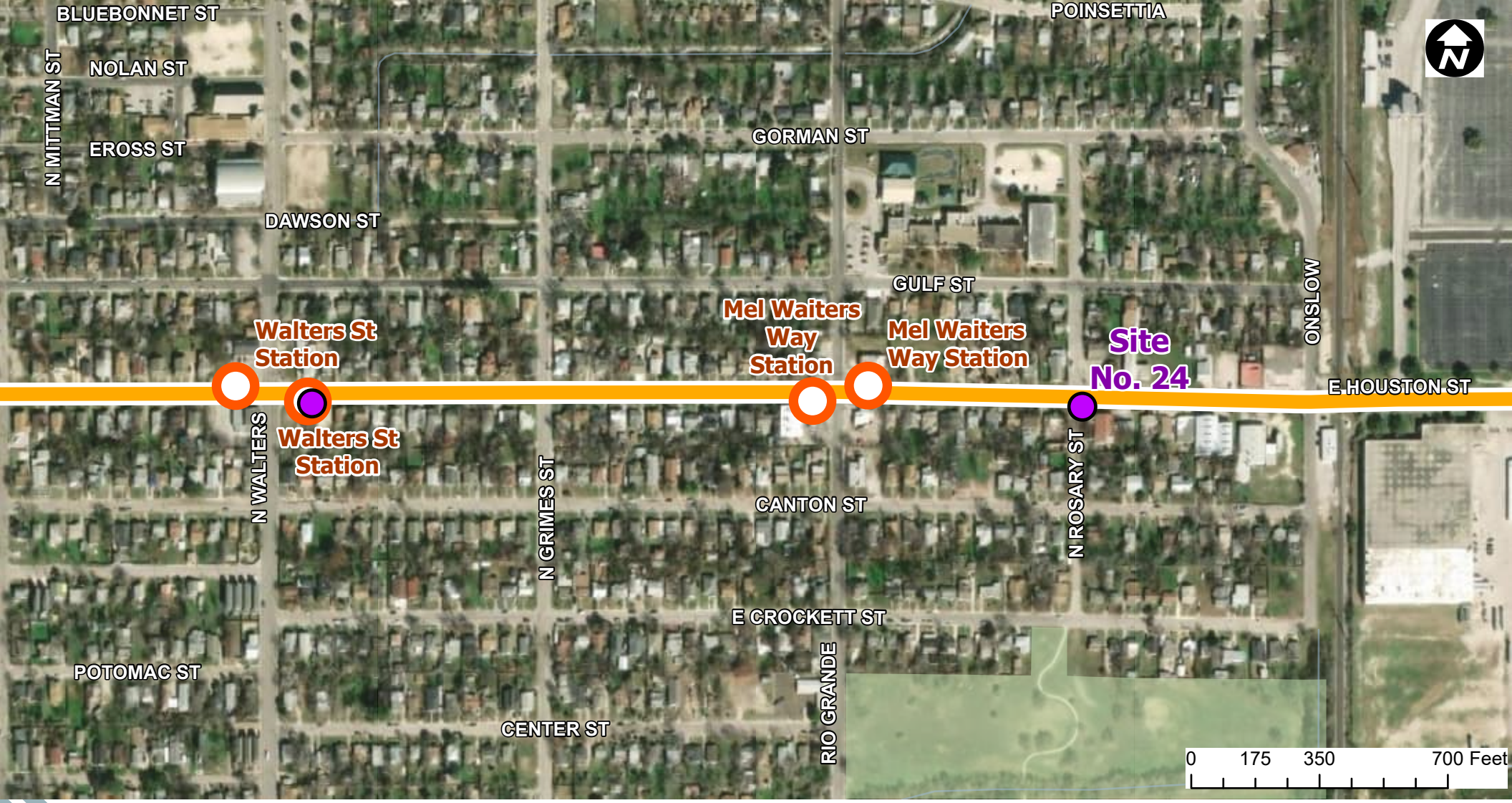


Noise Measurement Sites

Legend

- ART E/W Alignment
- ART E/W Stations
- Noise Measurement Sites

Sources: WSP



Noise Measurement Sites

Legend

- ART E/W Alignment
- ART E/W Stations
- Noise Measurement Sites

Sources: WSP

Noise Measurement Location Descriptions

Site 1: 4445 West Commerce Street

This measurement site represents outdoor dining areas at commercial properties between General McMullen Drive to Matyear Street. Most of properties adjacent to Commerce Street in this area are commercial, retail and light industrial uses. There are no residential properties that are adjacent to commerce Street within this area. The measurement site taken near the fence line, in front of the Wendy's Restaurant on the north side of Commerce Street, is approximately 25ft to the edge of pavement and 55ft to the center of Commerce Street. The closest building setback is approximately 95ft to the center of Commerce Street.

Measurement Location (Source: WSP Team)

Measurement Site - Facing west at Commerce St. & Holz St. (Source: Google Earth)

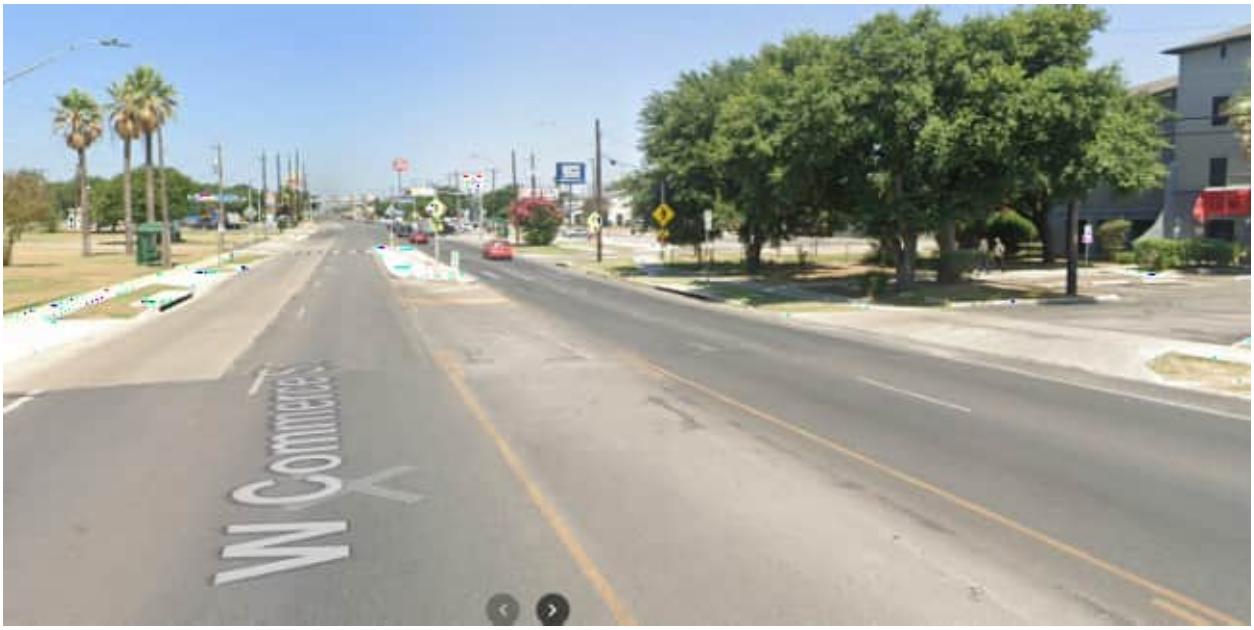
Measurement Site - Facing east at Commerce St. & Holz St. (Source: Google Earth)

Site 2: 4243 West Commerce Street

This measurement site represents residential properties between Matyear Street and NW 24th Street. Most of properties adjacent to Commerce Street in this area are commercial and retail uses. The main residential property in this area is the Lago Vista Apartments. The measurement site taken near the fence line along the north side of Commerce Street is approximately 30ft to the edge of pavement and 60ft to the center of Commerce Street. The closest building setback approximately 125ft to the center of Commerce Street.

Measurement Location (Source: WSP Team)

Measurement Site - Facing west at Commerce St. & Apache Creek Bridge Overcrossing. (Source: Google Earth)

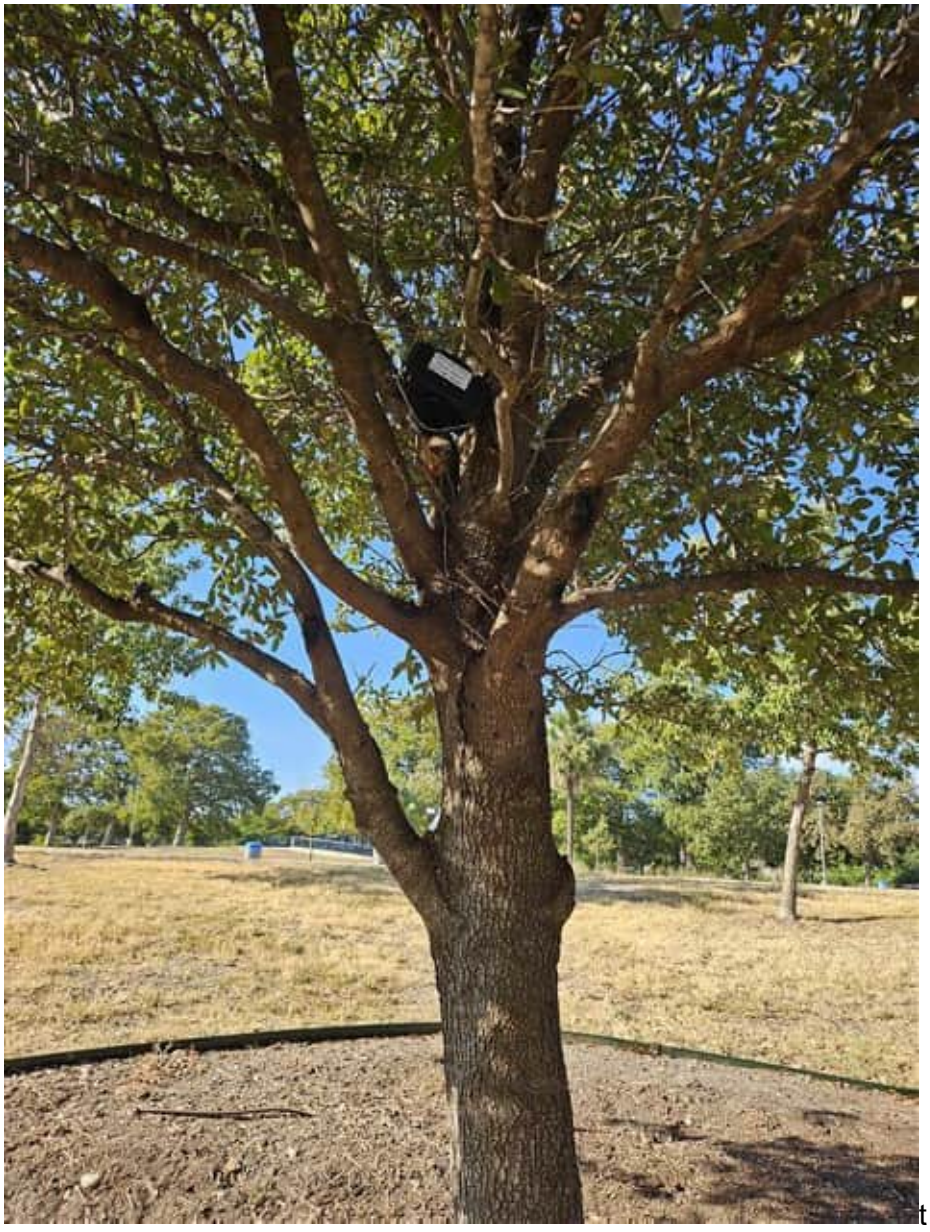


Measurement Site - Facing east at Commerce St. & Apache Creek Bridge Overcrossing. (Source: Google Earth)

Site 3: 3501 Buena Vista Street (Elmdorf Lake Park)

This measurement site represents residential properties between NW 24th Street and NW 20th Street. Most of properties adjacent to Commerce/Buena Vista Street in this area are commercial, retail, and residential uses. The measurement site taken near the sidewalk, along the south side of Buena Vista Street, is approximately 17ft to the edge of pavement and 37ft to the center of Buena Vista Street. The closest building setback approximately 50ft to the center of Buena Vista Street.

Measurement Location (Source: WSP Team)



Measurement Site - Facing west at Buena Vista St. & NW 20th St. (Source: Google Earth)

Measurement Site - Facing east at Buena Vista St. & NW 20th St. (Source: Google Earth)

Site 4: 207 SW 19th Street

This measurement site represents residential properties between NW 20th Street and S Minter Street. Most of properties adjacent to Buena Vista Street in this area are residential uses. The measurement site taken near the sidewalk, along the southwest side of the SW 19th Street and Buena Vista Steet intersection, is approximately 115ft to the edge of pavement and 130ft to the center of Buena Vista Street. The closest building setback is approximately 45ft to the center of Buena Vista Street.

Measurement Location (Source: WSP Team)

Measurement Site - Facing west at Buena Vista St. & NW 19th St. (Source: Google Earth)

Measurement Site - Facing east at Buena Vista St. & NW 19th St. (Source: Google Earth)

Site 5: 3114 Buena Vista Street

This measurement site represents residential properties between S Minter Street and S Hamilton Avenue. Most of properties adjacent to Buena Vista Street in this area are residential uses. The measurement site taken near the sidewalk, along the south side of Buena Vista Steet, is approximately 5ft to the edge of pavement and 20ft to the center of Buena Vista Street. The closest building setback approximately 45ft to the center of Buena Vista Street.

Measurement Location (Source: WSP Team)

Measurement Site - Facing west at Buena Vista St. & S Picoso St. (Source: Google Earth)

Measurement Site - Facing east at Buena Vista St. & S Picoso St. (Source: Google Earth)

Site 6: 2702 Buena Vista Street

This measurement site represents residential properties between S Hamilton Avenue and S Zarzamora Street. Most of properties adjacent to Buena Vista Street in this area are residential uses. The measurement site taken near the sidewalk, along the south side of Buena Vista Steet, is approximately 5ft to the edge of pavement and 20ft to the center of Buena Vista Street. The closest building setback approximately 45ft to the center of Buena Vista Street.

Measurement Location (Source: WSP Team)

Measurement Site - Facing west at Buena Vista St. & S Murry St. (Source: Google Earth)

Measurement Site - Facing east at Buena Vista St. & S Murry St. (Source: Google Earth)

Site 7: 3431 W Commerce Street

This measurement site represents residential properties between NW 21st Street and N Minter Street. Most of properties adjacent to Commerce Street in this area are commercial and residential uses. The measurement site taken near the sidewalk, along the north side of Commerce Steet, is approximately 5ft to the edge of pavement and 20ft to the center of Commerce Street. The closest building setback approximately 45ft to the center of Commerce Street.

Measurement Location (Source: WSP Team)

Measurement Site - Facing west at Commerce St. & S 19th St. (Source: Google Earth)

Measurement Site - Facing east at Commerce St. & S 19th St. (Source: Google Earth)

Site 8: 3330 W Commerce Street

This measurement site represents residential properties between N Minter Street and N Hamilton Street. Most of properties adjacent to Commerce Street in this area are commercial and residential uses. The measurement site taken near the sidewalk, along the south side of Commerce Steet, is approximately 5ft to the edge of pavement and 20ft to the center of Commerce Street. The closest building setback approximately 45ft to the center of Commerce Street.

Measurement Location (Source: WSP Team)

Measurement Site - Facing west at Commerce St. & SW 18th St. (Source: Google Earth)

Measurement Site - Facing east at Commerce St. & SW 18th St. (Source: Google Earth)

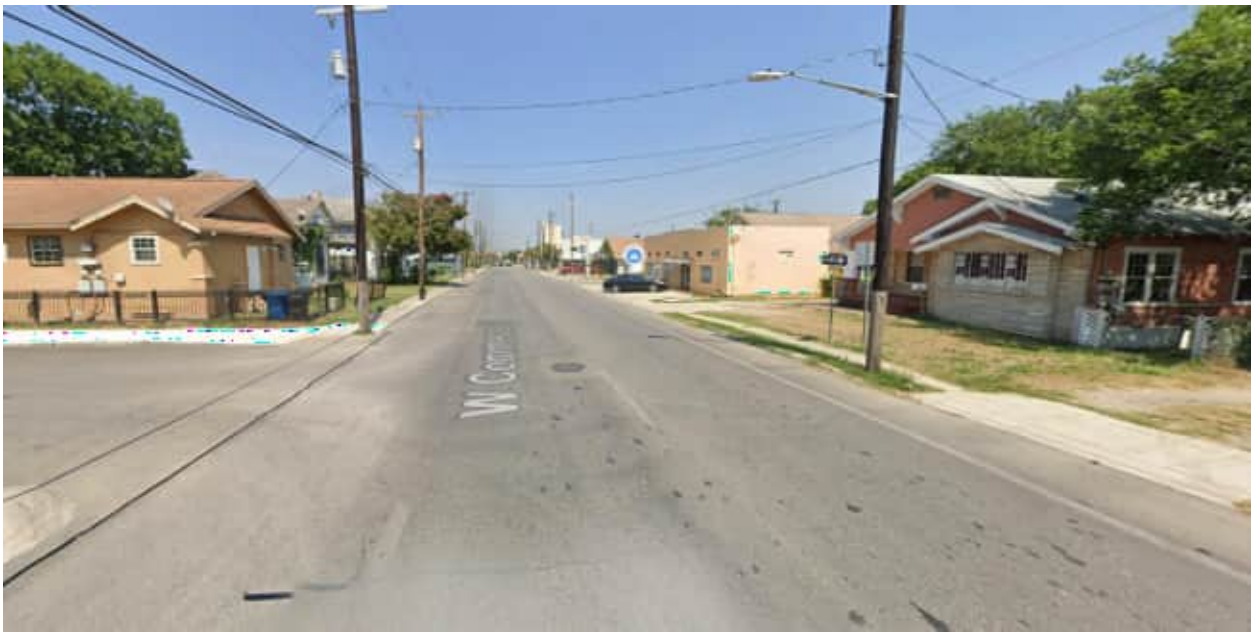
Site 9: 3005 W Commerce Street

This measurement site represents residential properties between N Hamilton Street and N Zarzamora Street. Most of properties adjacent to Commerce Street in this area are commercial and residential uses. The measurement site taken near the sidewalk, along the north side of Commerce Steet, is approximately 20ft to the edge of pavement and 45ft to the center of Commerce Street. The closest building setback approximately 45ft to the center of Commerce Street.

Measurement Location (Source: WSP Team)

Measurement Site - Facing west at Commerce St. & N Murry St. (Source: Google Earth)

Measurement Site - Facing east at Commerce St. & N Murry St. (Source: Google Earth)



Site 10: 2410 Buena Vista Street

This measurement site represents residential properties between S Zarzamora Street and S Navidad Street. Most of properties adjacent to Buena Vista Street in this area are commercial and residential uses. The measurement site taken near the sidewalk, along the south side of Buena Vista Steet, is approximately 10ft to the edge of pavement and 25ft to the center of Buena Vista Street. The closest building setback approximately 45ft to the center of Buena Vista Street.

Measurement Location (Source: WSP Team)

Measurement Site - Facing west at Buena Vista St. & S Calaveras St. (Source: Google Earth)

Measurement Site - Facing east at Buena Vista St. & S Calaveras St. (Source: Google Earth)

Site 11: 1920 Buena Vista Street

This measurement site represents residential properties between S Navidad Street and S Trinity Street. Most of properties adjacent to Buena Vista Street in this area are commercial and residential uses. The measurement site taken near the sidewalk, along the south side of Buena Vista Steet, is approximately 5ft to the edge of pavement and 20ft to the center of Buena Vista Street. The closest building setback approximately 45ft to the center of Buena Vista Street.

Measurement Location (Source: WSP Team)

Measurement Site - Facing west at Buena Vista St. & S Sabinas St. (Source: Google Earth)

Measurement Site - Facing east at Buena Vista St. & S Sabinas St. (Source: Google Earth)

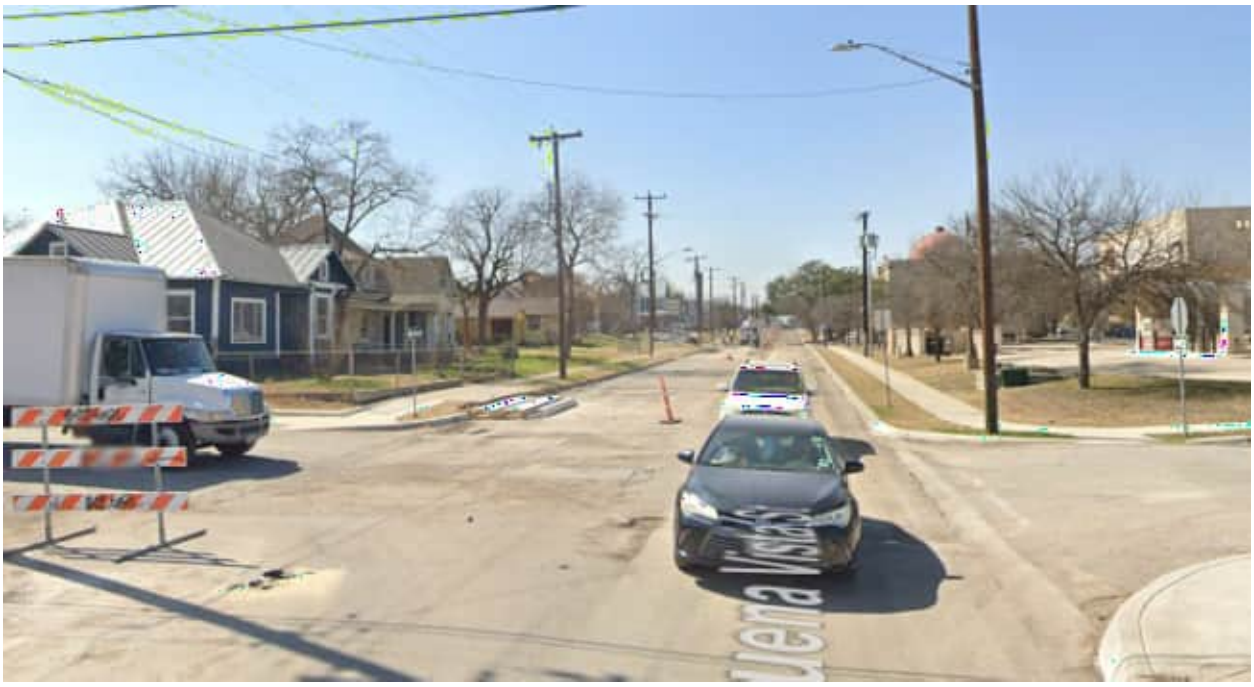
Site 12: 1422 Buena Vista Street

This measurement site represents residential properties between S Trinity Street and S Brazos Street. Most of properties adjacent to Buena Vista Street in this area are commercial and residential uses. The measurement site taken near the sidewalk, along the southeast corner of Buena Vista Steet and N Las Moras Street, is approximately 5ft to the edge of pavement and 20ft to the center of Buena Vista Street. The closest building setback approximately 45ft to the center of Buena Vista Street.

Measurement Location (Source: WSP Team)

Measurement Site - Facing west at Buena Vista St. & S Las Moras St. (Source: Google Earth)

Measurement Site - Facing east at Buena Vista St. & S Las Moras St. (Source: Google Earth)



Site 13: 2523 W Commerce Street

This measurement site represents residential properties between N Zarzamora Street and N Sabinas Street. Most of properties adjacent to Commerce Street in this area are commercial and residential uses. The measurement site taken near the sidewalk, along the northeast corner of Commerce Steet and N Chupaderas Street, is approximately 40ft to the edge of pavement and 55ft to the center of Commerce Street. The closest building setback approximately 45ft to the center of Commerce Street.

Measurement Location (Source: WSP Team)

Measurement Site - Facing west at Commerce St. & S Chupaderas St. (Source: Google Earth)

Measurement Site - Facing east at Commerce St. & S Chupaderas St. (Source: Google Earth)

Site 14: 2015 W Commerce Street

This measurement site represents residential properties between N Sabinas Street and N Los Moras Street. Most of properties adjacent to Commerce Street in this area are commercial and residential uses. The measurement site taken near the sidewalk, along the northeast corner of Commerce Steet and N Trinity Street, is approximately 30ft to the edge of pavement and 50ft to the center of Commerce Street. The closest building setback approximately 45ft to the center of Commerce Street.

Measurement Location (Source: WSP Team)

Measurement Site - Facing west at Commerce St. & S Trinity St. (Source: Google Earth)

Measurement Site - Facing east at Commerce St. & S Trinity St. (Source: Google Earth)

Site 15: 1213 Buena Vista Street

This measurement site represents residential properties between N Brazos Street and S Colorado Street. Most of properties adjacent to Buena Vista Street in this area are commercial and residential uses. The measurement site taken near the sidewalk, along the north side of Buena Vista Steet, is approximately 10ft to the edge of pavement and 30ft to the center of Buena Vista Street. The closest building setback approximately 40ft to the center of Buena Vista Street.

Measurement Location (Source: WSP Team)

Measurement Site - Facing west at Buena Vista St. & S Smith St. (Source: Google Earth)

Measurement Site - Facing east at Buena Vista St. & S Smith St. (Source: Google Earth)

Site 16: 1102 Buena Vista Street

This measurement site represents residential properties between S Colorado Street and S Salado Street. Most of properties adjacent to Buena Vista Street in this area are commercial and residential uses. The measurement site taken near the sidewalk, along the south side of Buena Vista Steet, is approximately 140ft to the edge of pavement and 160ft to the center of Buena Vista Street. The closest building setback approximately 40ft to the center of Buena Vista Street.

Measurement Location (Source: WSP Team)

Measurement Site - Facing west at Buena Vista St. & S Richter St. (Source: Google Earth)

Measurement Site - Facing east at Buena Vista St. & S Richter St. (Source: Google Earth)

Site 17: 1406 W Commerce Street

This measurement site represents residential properties between N Los Moras Street and S Salado Street. Most of properties adjacent to Commerce Street in this area are commercial and residential uses. The measurement site taken near the sidewalk, along the south side of Commerce Steet, is approximately 20ft to the edge of pavement and 50ft to the center of Commerce Street. The closest building setback approximately 45ft to the center of Commerce Street.

Measurement Location(Source: WSP Team)

Measurement Site - Facing west at Commerce St. & N Richter St. (Source: Google Earth)

Measurement Site - Facing east at Commerce St. & N Richter St. (Source: Google Earth)

Site 18: 1174 E Commerce Street

This measurement site represents residential properties between I-37 and S Houston Street. Most of properties adjacent to Commerce Street in this area are commercial and residential uses. The measurement site taken near the sidewalk, along the south side of Commerce Steet, is approximately 35ft to the edge of pavement and 60ft to the center of Commerce Street. The closest building setback approximately 170ft to the center of Commerce Street.

Measurement Location (Source: WSP Team)

Measurement Site - Facing west at Commerce St. & N Hoefgen Ave. (Source: Google Earth)

Measurement Site - Facing east at Commerce St. & N Hoefgen Ave. (Source: Google Earth)

Site 19: 1602 E Houston Street

This measurement site represents residential properties between N Cherry Street and N Monumental. Most of properties adjacent to E Houston Street in this area are commercial, retail and residential uses. The measurement site taken near the sidewalk, along the south side of E Houston Steet, is approximately 5ft to the edge of pavement and 20ft to the center of E Houston Street. The closest building setback approximately 40ft to the center of E Houston Street.

Measurement Location (Source: WSP Team)

Measurement Site - Facing west at E Houston St. & N Hackberry St. (Source: Google Earth)

Measurement Site - Facing east at E Houston St. & N Hackberry St. (Source: Google Earth)

Site 20: 1934 E Houston Street

This measurement site represents residential properties between N Monumental to N New Braunfels Avenue. Most of properties adjacent to E Houston Street in this area are commercial, retail and residential uses. The measurement site taken near the sidewalk, along the southwest corner of E Houston Steet and N Palmetto Street, is approximately 10ft to the edge of pavement and 30ft to the center of E Houston Street. The closest building setback approximately 40ft to the center of E Houston Street.

Measurement Location (Source: WSP Team)

Measurement Site - Facing west at E Houston St. & N Palmetto Ave. (Source: Google Earth)

Measurement Site - Facing east at E Houston St. & N Palmetto Ave. (Source: Google Earth)

Site 21: 2246 E Houston Street

This measurement site represents residential properties between N New Braunfels Avenue to N Gevers Street. Most of properties adjacent to E Houston Street in this area are commercial and residential uses. The measurement site taken near the sidewalk, along the south side of E Houston Steet, is approximately 10ft to the edge of pavement and 30ft to the center of E Houston Street. The closest building setback approximately 45ft to the center of E Houston Street.

Measurement Location (Source: WSP Team)

Measurement Site - Facing west at E Houston St. & N Polaris St. (Source: Google Earth)

Measurement Site - Facing east at E Houston St. & N Polaris St. (Source: Google Earth)

Site 22: 2246 E Houston Street

This measurement site represents residential properties between N Gevers Street to N Walters Street. Most of properties adjacent to E Houston Street in this area are commercial and residential uses. The measurement site taken near the sidewalk, along the north side of E Houston Steet, is approximately 5ft to the edge of pavement and 20ft to the center of E Houston Street. The closest building setback approximately 40ft to the center of E Houston Street.

Measurement Location (Source: WSP Team)

Measurement Site - Facing west at E Houston St. & N Mittman St. (Source: Google Earth)

Measurement Site - Facing east at E Houston St. & N Mittman St. (Source: Google Earth)

Site 23: 2606 E Houston Street

This measurement site represents residential properties between N Walters Street to Mel Waiters Way. Most of properties adjacent to E Houston Street in this area are commercial and residential uses. The measurement site taken near the sidewalk, along the south side of E Houston Steet, is approximately 5ft to the edge of pavement and 20ft to the center of E Houston Street. The closest building setback approximately 40ft to the center of E Houston Street.

Measurement Location (Source: WSP Team)

Measurement Site - Facing west at E Houston St. & N Walters St. (Source: Google Earth)

Measurement Site - Facing east at E Houston St. & N Walters St. (Source: Google Earth)

Site 24: 2900 E Houston Street

This measurement site represents residential properties between Mel Waiters Way to Coca Cola Place. Most of properties adjacent to E Houston Street in this area are commercial and residential uses. The measurement site taken near the sidewalk, along the south side of E Houston Steet, is approximately 15ft to the edge of pavement and 35ft to the center of E Houston Street. The closest building setback approximately 40ft to the center of E Houston Street.

Measurement Location (Source: WSP Team)

Measurement Site - Facing west at E Houston St. & N Rosary St. (Source: Google Earth)

Measurement Site - Facing east at E Houston St. & N Rosary St. (Source: Google Earth)

QUESTIONS?

To learn more about this project and download materials, visit **KeepSAmoving.com**.

Call 210-362-2590

Email: KeepSAmoving@viainfo.net

VIA RAPID