



# Traffic Noise Analysis Report

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## Barton Skyway Ramp Relief Project

CSJ: 3136-01-0193

Austin District

December 2021

*The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 9, 2019, and executed by FHWA and TxDOT.*

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The Central Texas Regional Mobility Authority, in conjunction with the Texas Department of Transportation (TxDOT), is assessing the environmental impacts associated with proposed improvements along State Loop 1 (MoPac Expressway) from Barton Skyway to State Loop 360 (SL 360 or Lp 360) in Austin, Travis County, as can be seen in the project location map on **Attachment A**. The proposed project consists of ramp improvements including an acceleration lane for the southbound Barton Skyway entrance ramp and the addition of a 1.55-mile southbound auxiliary lane from Barton Skyway to SL 360. This technical report documents the potential noise impacts associated with the proposed improvements.

## Introduction

This analysis was accomplished in accordance with TxDOT's (FHWA-approved) Traffic Noise Policy (2019).

Sound from highway traffic is generated primarily from a vehicle's tires, engine and exhaust. It is commonly measured in decibels and is expressed as "dB."

Sound occurs over a wide range of frequencies. However, not all frequencies are detectable by the human ear; therefore, an adjustment is made to the high and low frequencies to approximate the way an average person hears traffic sounds. This adjustment is called A-weighting and is expressed as "dB(A)."

Also, because traffic sound levels are never constant due to the changing number, type and speed of vehicles, a single value is used to represent the average or equivalent sound level and is expressed as "Leq."

The traffic noise analysis typically includes the following elements:

- Identification of land use activity areas that might be impacted by traffic noise.
- Determination of existing noise levels.
- Prediction of future noise levels.
- Identification of possible noise impacts.
- Consideration and evaluation of measures to reduce noise impacts.

The FHWA has established the following Noise Abatement Criteria (NAC) for various land use activity areas that are used as one of two means to determine when a traffic noise impact would occur.

**Table 1. FHWA Noise Abatement Criteria (NAC)**

Activity Category	FHWA (dB(A) Leq)	Description of Land Use Activity Areas
A	57 (exterior)	Lands on which serenity and quiet are of extra-ordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (exterior)	Residential
C	67 (exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings
D	52 (interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios
E	72 (exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A-D or F.
F	--	Agricultural, 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.

A noise impact occurs when either the absolute or relative criterion is met:

**Absolute criterion** - The predicted noise level at a receptor approaches, equals, or exceeds the NAC. "Approach" is defined as one dB(A) below the NAC. For example: a noise impact would occur at a Category B residence if the noise level is predicted to be 66 dB(A) or above.

**Relative criterion** - The predicted noise level substantially exceeds the existing noise level at a receptor even though the predicted noise level does not approach, equal or exceed the NAC. "Substantially exceeds" is defined as more than 10 dB(A). For example: a noise impact would occur at a Category B residence if the existing level is 54 dB(A) and the predicted level is 65 dB(A).

When a traffic noise impact occurs, noise abatement measures must be considered. A noise abatement measure is any positive action taken to reduce the impact of traffic noise on an activity area.

## Analysis

The FHWA traffic noise modeling software (TNM 2.5) was used to calculate existing and predicted traffic noise levels. The model primarily considers the number, type and speed of vehicles; highway alignment and grade; cuts, fills and natural berms; surrounding terrain features; and the locations of activity areas likely to be impacted by the associated traffic noise.

The approved traffic data used in this analysis is included in **Attachment B**.

## Validation

A validation study was performed in order to ensure that traffic noise is the main source of noise and to verify that the existing model accurately predicts existing traffic noise based on current conditions. Model validation compares field-collected sound level measurements to traffic noise levels calculated in an existing condition model that used field-collected traffic parameters. Differences between the measured and calculated levels for this project were within the +/- 3 dB(A) tolerance allowed by FHWA. Therefore, the existing noise model is considered validated for this project. Additional information on the validation study is included in **Attachment C**.

## Results

Existing and predicted traffic noise levels were modeled at receiver locations (**Table 2** and **Attachment C**) that represent the land use activity areas adjacent to the proposed project that might be impacted by traffic noise and potentially benefit from feasible and reasonable noise abatement. Additional receivers to the north and south were analyzed in the model but are not included in this report as they are located outside of the project limits.

**Table 2. Traffic Noise Levels dB(A) Leq**

Representative Receiver	NAC Category	NAC Level	Existing	Predicted 2043	Change (+/-)	Noise Impact (Yes/No)
R827 MedSpring Office Trail trailhead	C	67	65	67	2	Yes
R889 Via Fortuna Hiking Trail trailhead	C	67	63	65	2	No
R2685 Barton Creek/Gaines Greenbelt/Twin Falls Trail trailhead	C	67	67	69	2	Yes
R890 Barton Creek Landing Apartment	B	67	56	58	2	No
R891 Barton Creek Landing Apartment 2nd floor	B	67	60	62	2	No
R892 Gables at the Terrace Pool	C	67	64	65	1	No
R893 Barton Creek Landing Apartment	B	67	55	57	2	No
R894 Barton Creek Landing Apartment 2nd floor	B	67	59	61	2	No
R895 Barton Creek Landing Apartment	B	67	55	57	2	No
R896 Barton Creek Landing Apartment 2nd floor	B	67	59	61	2	No

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Representative Receiver	NAC Category	NAC Level	Existing	Predicted 2043	Change (+/-)	Noise Impact (Yes/No)
R897 Barton Creek Landing Apartment	B	67	55	57	2	No
R898 Barton Creek Landing Apartment	B	67	56	57	1	No
R899 Barton Creek Landing Apartment	B	67	56	58	2	No
R900 Barton Creek Landing Apartment	B	67	55	57	2	No
R901 Barton Creek Landing Apartment	B	67	58	59	1	No
R902 Barton Creek Landing Apartment 2nd floor	B	67	59	62	3	No
R903 Barton Creek Landing Apartment 3rd floor	B	67	62	64	2	No
R904 Barton Creek Landing Apartment	B	67	55	58	3	No
R905 Barton Creek Landing Apartment 2nd floor	B	67	59	61	2	No
R906 Barton Creek Landing Apartment 3rd floor	B	67	62	64	2	No
R907 Barton Creek Landing Apartment	B	67	58	60	2	No
R908 Barton Creek Landing Apartment	B	67	56	58	2	No
R909 Barton Creek Landing Apartment 2nd floor	B	67	60	62	2	No
R910 Barton Creek Landing Apartment 3rd floor	B	67	63	64	1	No
R911 Barton Creek Landing Apartment	B	67	56	59	3	No
R912 Barton Creek Landing Apartment	B	67	56	58	2	No
R913 Barton Creek Landing Apartment 2nd floor	B	67	60	62	2	No
R914 Barton Creek Landing Apartment	B	67	56	59	3	No
R915 Barton Creek Landing Apartment 2nd floor	B	67	60	63	3	No

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Representative Receiver	NAC Category	NAC Level	Existing	Predicted 2043	Change (+/-)	Noise Impact (Yes/No)
R916 Barton Creek Landing Apartment 3rd floor	B	67	63	65	2	No
R917 Barton Creek Landing Apartment	B	67	56	58	2	No
R918 Barton Creek Landing Apartment 2nd floor	B	67	60	63	3	No
R919 Barton Creek Landing Apartment	B	67	56	58	2	No
R920 Barton Creek Landing Apartment 2nd floor	B	67	60	63	3	No
R921 Barton Creek Landing Apartment 3rd floor	B	67	63	65	2	No
R922 Barton Creek Landing Apartment	B	67	57	59	2	No
R923 Barton Creek Landing Apartment	B	67	56	58	2	No
R924 Barton Creek Landing Apartment	B	67	56	58	2	No
R925 Barton Creek Landing Apartment 2nd floor	B	67	60	63	3	No
R926 Barton Creek Landing Apartment 3rd floor	B	67	63	65	2	No
R927 Barton Creek Landing Apartment	B	67	57	60	3	No
R928 Barton Creek Landing Apartment 2nd floor	B	67	61	64	3	No
R929 Barton Creek Landing Apartment	B	67	57	59	2	No
R930 Barton Creek Landing Apartment 2nd floor	B	67	61	64	3	No
R931 Barton Creek Landing Apartment	B	67	57	60	3	No
R932 Barton Creek Landing Apartment 2nd floor	B	67	61	64	3	No
R933 Barton Creek Landing Apartment	B	67	57	60	3	No
R934 Barton Creek Landing Apartment 2nd floor	B	67	61	64	3	No

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Representative Receiver	NAC Category	NAC Level	Existing	Predicted 2043	Change (+/-)	Noise Impact (Yes/No)
R935 Barton Creek Landing Apartment	B	67	58	60	2	No
R936 Barton Creek Landing Apartment	B	67	58	60	2	No
R937 Post Barton Creek Pool	C	67	61	63	2	No
R938 Landmark Barton Creek Pool	C	67	57	59	2	No
R2686 Abuelos Mexican Restaurant	E	72	63	64	1	No
R2687 Cliffs at Barton Creek Apts.	B	67	70	72	2	Yes
R2688 Cliffs at Barton Creek Apts. 2nd floor	B	67	72	73	1	Yes
R2689 Cliffs at Barton Creek Apts. 3rd floor	B	67	72	74	2	Yes
R2690 Cliffs at Barton Creek Apts.	B	67	71	72	1	Yes
R2691 Cliffs at Barton Creek Apts. 2nd floor	B	67	72	74	2	Yes
R2692 Cliffs at Barton Creek Apts. 3rd floor	B	67	72	74	2	Yes
R2693 Cliffs at Barton Creek Apts. 2nd floor	B	67	71	72	1	Yes
R2694 Cliffs at Barton Creek Apts. 3rd floor	B	67	71	73	2	Yes
R2695 Cliffs at Barton Creek Apts.	B	67	71	72	1	Yes
R2696 Cliffs at Barton Creek Apts. 2nd floor	B	67	72	73	1	Yes
R2697 Cliffs at Barton Creek Apts. 3rd floor	B	67	72	74	2	Yes
R2698 Cliffs at Barton Creek Apts. 2nd floor	B	67	71	72	1	Yes
R2699 Cliffs at Barton Creek Apts. 3rd floor	B	67	72	73	1	Yes
R2700 Cliffs at Barton Creek Apts. 2nd floor	B	67	71	72	1	Yes



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Representative Receiver	NAC Category	NAC Level	Existing	Predicted 2043	Change (+/-)	Noise Impact (Yes/No)
R2701 Cliffs at Barton Creek Apts. 3rd floor	B	67	71	73	2	Yes
R2702 Cliffs at Barton Creek Apts.	B	67	71	72	1	Yes
R2703 Cliffs at Barton Creek Apts. 2nd floor	B	67	72	73	1	Yes
R2704 Cliffs at Barton Creek Apts. 3rd floor	B	67	72	74	2	Yes
R2705 Cliffs at Barton Creek Apts. 2nd floor	B	67	71	72	1	Yes
R2706 Cliffs at Barton Creek Apts. 3rd floor	B	67	71	73	2	Yes
R2707 Cliffs at Barton Creek Apts.	B	67	70	71	1	Yes
R2708 Cliffs at Barton Creek Apts. 2nd floor	B	67	71	72	1	Yes
R2709 Cliffs at Barton Creek Apts. 3rd floor	B	67	71	73	2	Yes
R2710 Cliffs at Barton Creek Apts.	B	67	70	72	2	Yes
R2711 Cliffs at Barton Creek Apts. 2nd floor	B	67	72	73	1	Yes
R2712 Cliffs at Barton Creek Apts. 3rd floor	B	67	72	74	2	Yes
R2713 Cliffs at Barton Creek Apts.	B	67	71	72	1	Yes
R2714 Cliffs at Barton Creek Apts. 2nd floor	B	67	72	73	1	Yes
R2715 Cliffs at Barton Creek Apts. 3rd floor	B	67	72	74	2	Yes
R2716 Cliffs at Barton Creek Apts. 2nd floor	B	67	71	72	1	Yes
R2717 Cliffs at Barton Creek Apts. 3rd floor	B	67	71	73	2	Yes
R2718 Cliffs at Barton Creek Apts.	B	67	71	72	1	Yes
R2719 Cliffs at Barton Creek Apts. 2nd floor	B	67	72	73	1	Yes

## Traffic Noise Analysis Report

Representative Receiver	NAC Category	NAC Level	Existing	Predicted 2043	Change (+/-)	Noise Impact (Yes/No)
R2720 Cliffs at Barton Creek Apts. 3rd floor	B	67	72	74	2	Yes
R2721 Cliffs at Barton Creek Apts. 2nd floor	B	67	71	72	1	Yes
R2722 Cliffs at Barton Creek Apts. 3rd floor	B	67	71	73	2	Yes
R2723 Cliffs at Barton Creek Apts. 2nd floor	B	67	71	72	1	Yes
R2724 Cliffs at Barton Creek Apts. 3rd floor	B	67	71	73	2	Yes
R2725 Cliffs at Barton Creek Apts.	B	67	70	72	2	Yes
R2726 Cliffs at Barton Creek Apts. 2nd floor	B	67	71	73	2	Yes
R2727 Cliffs at Barton Creek Apts. 3rd floor	B	67	72	74	2	Yes
R2728 Cliffs at Barton Creek Apts. 2nd floor	B	67	71	72	1	Yes
R2729 Cliffs at Barton Creek Apts. 3rd floor	B	67	71	73	2	Yes
R2730 Cliffs at Barton Creek Apts.	B	67	70	71	1	Yes
R2731 Cliffs at Barton Creek Apts. 2nd floor	B	67	71	72	1	Yes
R2732 Cliffs at Barton Creek Apts. 3rd floor	B	67	71	73	2	Yes
R2733 Cliffs at Barton Creek Apts.	B	67	69	70	1	Yes
R2734 Cliffs at Barton Creek Apts. 2nd floor	B	67	70	71	1	Yes
R2735 Cliffs at Barton Creek Apts. 3rd floor	B	67	71	72	1	Yes
R2736 Cliffs at Barton Creek Apts.	B	67	69	71	2	Yes
R2737 Cliffs at Barton Creek Apts. 2nd floor	B	67	70	72	2	Yes
R2738 Cliffs at Barton Creek Apts. 3rd floor	B	67	71	73	2	Yes

## Traffic Noise Analysis Report

Representative Receiver	NAC Category	NAC Level	Existing	Predicted 2043	Change (+/-)	Noise Impact (Yes/No)
R2739 Cliffs at Barton Creek Apts.	B	67	70	71	1	Yes
R2740 Cliffs at Barton Creek Apts. 2nd floor	B	67	71	73	2	Yes
R2741 Cliffs at Barton Creek Apts. 3rd floor	B	67	72	73	1	Yes
R2742 Cliffs at Barton Creek Apts.	B	67	68	69	1	Yes
R2743 Cliffs at Barton Creek Apts. 2nd floor	B	67	69	70	1	Yes
R2744 Cliffs at Barton Creek Apts. 3rd floor	B	67	70	71	1	Yes
R2745 Cliffs at Barton Creek Apts. 2nd floor	B	67	69	71	2	Yes
R2746 Cliffs at Barton Creek Apts. 3rd floor	B	67	70	71	1	Yes
R2747 Cliffs at Barton Creek Apts. 2nd floor	B	67	70	71	1	Yes
R2748 Cliffs at Barton Creek Apts. 3rd floor	B	67	70	72	2	Yes
R2749 Cliffs at Barton Creek Apts. 2nd floor	B	67	70	71	1	Yes
R2750 Cliffs at Barton Creek Apts. 3rd floor	B	67	71	72	1	Yes
R2751 Cliffs at Barton Creek Apts.	B	67	70	71	1	Yes
R2752 Cliffs at Barton Creek Apts. 2nd floor	B	67	71	72	1	Yes
R2753 Cliffs at Barton Creek Apts. 3rd floor	B	67	71	73	2	Yes
R2754 Cliffs at Barton Creek Apts. 2nd floor	B	67	70	71	1	Yes
R2755 Cliffs at Barton Creek Apts. 3rd floor	B	67	71	72	1	Yes
R2756 Cliffs at Barton Creek Apts.	B	67	69	71	2	Yes
R2757 Cliffs at Barton Creek Apts. 2nd floor	B	67	70	72	2	Yes

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Representative Receiver	NAC Category	NAC Level	Existing	Predicted 2043	Change (+/-)	Noise Impact (Yes/No)
R2758 Cliffs at Barton Creek Apts. 3rd floor	B	67	71	72	1	Yes
R2759 Cliffs at Barton Creek Apts. 2nd floor	B	67	69	71	2	Yes
R2760 Cliffs at Barton Creek Apts. 3rd floor	B	67	70	71	1	Yes
R2761 Cliffs at Barton Creek Apts.	B	67	69	70	1	Yes
R2762 Cliffs at Barton Creek Apts. 2nd floor	B	67	70	71	1	Yes
R2763 Cliffs at Barton Creek Apts. 3rd floor	B	67	70	72	2	Yes
R2764 Cliffs at Barton Creek Apts. 2nd floor	B	67	69	70	1	Yes
R2765 Cliffs at Barton Creek Apts. 3rd floor	B	67	69	71	2	Yes
R2766 Cliffs at Barton Creek Apts. 2nd floor	B	67	69	70	1	Yes
R2767 Cliffs at Barton Creek Apts. 3rd floor	B	67	69	70	1	Yes
R2768 Cliffs at Barton Creek Apts.	B	67	68	69	1	Yes
R2769 Cliffs at Barton Creek Apts. 2nd floor	B	67	69	70	1	Yes
R2770 Cliffs at Barton Creek Apts. 3rd floor	B	67	70	71	1	Yes
R2771 Cliffs at Barton Creek Apts. 2nd floor	B	67	68	69	1	Yes
R2772 Cliffs at Barton Creek Apts. 3rd floor	B	67	69	70	1	Yes
R2773 Cliffs at Barton Creek Apts.	B	67	67	68	1	Yes
R2774 Cliffs at Barton Creek Apts. 2nd floor	B	67	68	70	2	Yes
R2775 Cliffs at Barton Creek Apts. 3rd floor	B	67	69	70	1	Yes
R2776 Cliffs at Barton Creek Apts.	B	67	66	68	2	Yes

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Representative Receiver	NAC Category	NAC Level	Existing	Predicted 2043	Change (+/-)	Noise Impact (Yes/No)
R2777 Cliffs at Barton Creek Apts. 2nd floor	B	67	68	69	1	Yes
R2778 Cliffs at Barton Creek Apts. 3rd floor	B	67	68	70	2	Yes
R2779 Apartment/Condos on Holly Hill Dr. - Unnamed	B	67	68	69	1	Yes
R2780 Apartment/Condos on Holly Hill Dr. - Unnamed 2nd floor	B	67	70	71	1	Yes
R2781 Apartment/Condos on Holly Hill Dr. - Unnamed	B	67	68	69	1	Yes
R2782 Apartment/Condos on Holly Hill Dr. - Unnamed 2nd floor	B	67	70	71	1	Yes
R2783 Apartment/Condos on Holly Hill Dr. - Unnamed	B	67	68	69	1	Yes
R2784 Apartment/Condos on Holly Hill Dr. - Unnamed 2nd floor	B	67	69	71	2	Yes
R2785 Apartment/Condos on Holly Hill Dr. - Unnamed	B	67	67	68	1	Yes
R2786 Apartment/Condos on Holly Hill Dr. - Unnamed 2nd floor	B	67	69	70	1	Yes
R2787 Apartment/Condos on Holly Hill Dr. - Unnamed	B	67	67	68	1	Yes
R2788 Apartment/Condos on Holly Hill Dr. - Unnamed 2nd floor	B	67	69	70	1	Yes
R2789 Apartment/Condos on Holly Hill Dr. - Unnamed	B	67	68	68	0	Yes
R2790 Apartment/Condos on Holly Hill Dr. - Unnamed 2nd floor	B	67	69	70	1	Yes
R2791 Apartment/Condos on Holly Hill Dr. - Unnamed	B	67	67	68	1	Yes

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Representative Receiver	NAC Category	NAC Level	Existing	Predicted 2043	Change (+/-)	Noise Impact (Yes/No)
R2792 Apartment/Condos on Holly Hill Dr. - Unnamed 2nd floor	B	67	69	70	1	Yes
R2793 Apartment/Condos on Holly Hill Dr. - Unnamed	B	67	67	68	1	Yes
R2794 Apartment/Condos on Holly Hill Dr. - Unnamed 2nd floor	B	67	69	70	1	Yes
R2795 Apartment/Condos on Holly Hill Dr. - Unnamed	B	67	67	68	1	Yes
R2796 Apartment/Condos on Holly Hill Dr. - Unnamed 2nd floor	B	67	69	70	1	Yes
R2797 Apartment/Condos on Holly Hill Dr. - Unnamed	B	67	67	68	1	Yes
R2798 Apartment/Condos on Holly Hill Dr. - Unnamed 2nd floor	B	67	69	70	1	Yes
R2799 Apartment/Condos on Holly Hill Dr. - Unnamed	B	67	67	68	1	Yes
R2800 Apartment/Condos on Holly Hill Dr. - Unnamed 2nd floor	B	67	69	70	1	Yes
R2801 Apartment/Condos on Holly Hill Dr. - Unnamed	B	67	67	68	1	Yes
R2802 Apartment/Condos on Holly Hill Dr. - Unnamed 2nd floor	B	67	69	70	1	Yes
R2803 Apartment/Condos on Holly Hill Dr. - Unnamed	B	67	67	68	1	Yes
R2804 Apartment/Condos on Holly Hill Dr. - Unnamed 2nd floor	B	67	69	70	1	Yes
R2805 Apartment/Condos on Holly Hill Dr. - Unnamed	B	67	67	68	1	Yes
R2806 Apartment/Condos on Holly Hill Dr. - Unnamed 2nd floor	B	67	69	70	1	Yes

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Representative Receiver	NAC Category	NAC Level	Existing	Predicted 2043	Change (+/-)	Noise Impact (Yes/No)
R2807 Apartment/Condos on Holly Hill Dr. - Unnamed	B	67	65	66	1	Yes
R2808 Apartment/Condos on Holly Hill Dr. - Unnamed	B	67	64	66	2	Yes
R2809 Apartment/Condos on Holly Hill Dr. - Unnamed	B	67	65	66	1	Yes
R939 Barton Skyway Office Complex	E	72	62	64	2	No
R940 Skyline at Barton Creek Apartments 2nd floor	B	67	60	62	2	No
R941 Skyline at Barton Creek Apartments 3rd floor	B	67	63	65	2	No
R942 Skyline at Barton Creek Apartments 4th floor	B	67	64	66	2	Yes
R943 Skyline at Barton Creek Apartments 2nd floor	B	67	58	60	2	No
R944 Skyline at Barton Creek Apartments 3rd floor	B	67	61	63	2	No
R945 Skyline at Barton Creek Apartments 4th floor	B	67	63	64	1	No
R946 Skyline at Barton Creek Apartments 2nd floor	B	67	60	62	2	No
R947 Skyline at Barton Creek Apartments 3rd floor	B	67	63	64	1	No
R948 Skyline at Barton Creek Apartments 4th floor	B	67	64	66	2	Yes
R949 Skyline at Barton Creek Apartments 2nd floor	B	67	60	62	2	No
R950 Skyline at Barton Creek Apartments 3rd floor	B	67	62	64	2	No
R951 Skyline at Barton Creek Apartments 4th floor	B	67	64	65	1	No
R952 Skyline at Barton Creek Apartments 2nd floor	B	67	60	62	2	No
R953 Skyline at Barton Creek Apartments 3rd floor	B	67	62	64	2	No
R954 Skyline at Barton Creek Apartments 4th floor	B	67	64	65	1	No

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Representative Receiver	NAC Category	NAC Level	Existing	Predicted 2043	Change (+/-)	Noise Impact (Yes/No)
R955 Skyline at Barton Creek Apartments 2nd floor	B	67	58	60	2	No
R956 Skyline at Barton Creek Apartments 3rd floor	B	67	61	63	2	No
R957 Skyline at Barton Creek Apartments 4th floor	B	67	63	64	1	No
R958 Skyline at Barton Creek Apartments 2nd floor	B	67	60	61	1	No
R959 Skyline at Barton Creek Apartments 3rd floor	B	67	62	64	2	No
R960 Skyline at Barton Creek Apartments 4th floor	B	67	63	65	2	No
R961 Skyline at Barton Creek Apartments 2nd floor	B	67	58	60	2	No
R962 Skyline at Barton Creek Apartments 3rd floor	B	67	61	63	2	No
R963 Skyline at Barton Creek Apartments 4th floor	B	67	63	64	1	No
R964 Skyline at Barton Creek Apartments 2nd floor	B	67	59	61	2	No
R965 Skyline at Barton Creek Apartments 3rd floor	B	67	62	64	2	No
R966 Skyline at Barton Creek Apartments 4th floor	B	67	63	65	2	No
R967 Skyline at Barton Creek Apartments 2nd floor	B	67	58	59	1	No
R968 Skyline at Barton Creek Apartments 3rd floor	B	67	61	63	2	No
R969 Skyline at Barton Creek Apartments 4th floor	B	67	63	64	1	No
R970 Skyline at Barton Creek Apartments 2nd floor	B	67	58	60	2	No
R971 Skyline at Barton Creek Apartments 3rd floor	B	67	61	63	2	No
R972 Skyline at Barton Creek Apartments 4th floor	B	67	63	65	2	No
R973 Skyline at Barton Creek Apartments 2nd floor	B	67	60	62	2	No



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Representative Receiver	NAC Category	NAC Level	Existing	Predicted 2043	Change (+/-)	Noise Impact (Yes/No)
R974 Skyline at Barton Creek Apartments 3rd floor	B	67	62	64	2	No
R975 Skyline at Barton Creek Apartments 4th floor	B	67	64	66	2	Yes
R976 Skyline at Barton Creek Apartments 2nd floor	B	67	59	61	2	No
R977 Skyline at Barton Creek Apartments 3rd floor	B	67	62	64	2	No
R978 Skyline at Barton Creek Apartments 4th floor	B	67	63	65	2	No
R979 Skyline at Barton Creek Apartments 2nd floor	B	67	60	62	2	No
R980 Skyline at Barton Creek Apartments 3rd floor	B	67	63	65	2	No
R981 Skyline at Barton Creek Apartments 4th floor	B	67	64	66	2	Yes
R982 Skyline at Barton Creek Apartments 2nd floor	B	67	60	62	2	No
R983 Skyline at Barton Creek Apartments 3rd floor	B	67	62	64	2	No
R984 Skyline at Barton Creek Apartments 4th floor	B	67	64	65	1	No
R985 Skyline at Barton Creek Apartments 2nd floor	B	67	61	63	2	No
R986 Skyline at Barton Creek Apartments 3rd floor	B	67	63	65	2	No
R987 Skyline at Barton Creek Apartments 4th floor	B	67	64	66	2	Yes
R988 Skyline at Barton Creek Apartments 2nd floor	B	67	60	62	2	No
R989 Skyline at Barton Creek Apartments 3rd floor	B	67	63	64	1	No
R990 Skyline at Barton Creek Apartments 4th floor	B	67	64	66	2	Yes
R991 Skyline at Barton Creek Apartments 4th floor	B	67	65	67	2	Yes
R992 Skyline at Barton Creek Apartments 2nd floor	B	67	61	63	2	No

## Traffic Noise Analysis Report

Representative Receiver	NAC Category	NAC Level	Existing	Predicted 2043	Change (+/-)	Noise Impact (Yes/No)
R993 Skyline at Barton Creek Apartments 3rd floor	B	67	64	65	1	No
R994 Skyline at Barton Creek Apartments 2nd floor	B	67	60	62	2	No
R995 Skyline at Barton Creek Apartments 3rd floor	B	67	63	65	2	No
R996 Skyline at Barton Creek Apartments 4th floor	B	67	64	66	2	Yes
R997 Skyline at Barton Creek Apartments 2nd floor	B	67	61	62	1	No
R998 Skyline at Barton Creek Apartments 3rd floor	B	67	63	65	2	No
R999 Skyline at Barton Creek Apartments 4th floor	B	67	64	66	2	Yes
R1000 Skyline at Barton Creek Apartments 2nd floor	B	67	62	64	2	No
R1001 Skyline at Barton Creek Apartments 3rd floor	B	67	64	66	2	Yes
R1002 Skyline at Barton Creek Apartments 4th floor	B	67	65	67	2	Yes
R1003 Skyline at Barton Creek Apartments 2nd floor	B	67	61	63	2	No
R1004 Skyline at Barton Creek Apartments 3rd floor	B	67	64	66	2	Yes
R1005 Skyline at Barton Creek Apartments 4th floor	B	67	65	67	2	Yes
R1006 Skyline at Barton Creek Apartments	B	67	56	58	2	No
R1007 Skyline at Barton Creek Apartments 2nd floor	B	67	60	61	1	No
R1008 Skyline at Barton Creek Apartments 3rd floor	B	67	63	64	1	No
R1009 Skyline at Barton Creek Apartments 2nd floor	B	67	60	62	2	No
R1010 Skyline at Barton Creek Apartments 3rd floor	B	67	63	65	2	No
R1011 Skyline at Barton Creek Apartments	B	67	56	58	2	No

## Traffic Noise Analysis Report

Representative Receiver	NAC Category	NAC Level	Existing	Predicted 2043	Change (+/-)	Noise Impact (Yes/No)
R1012 Skyline at Barton Creek Apartments	B	67	56	58	2	No
R1013 Skyline at Barton Creek Apartments 3rd floor	B	67	63	65	2	No
R1014 Skyline at Barton Creek Apartments 2nd floor	B	67	60	62	2	No
R1015 Skyline at Barton Creek Apartments 3rd floor	B	67	63	65	2	No
R1016 Skyline at Barton Creek Apartments 2nd floor	B	67	60	62	2	No
R1017 Skyline at Barton Creek Apartments	B	67	56	58	2	No
R1018 SHI International Corporation	E	72	59	61	2	No
R1019 Skyline at Barton Creek Apartments	B	67	57	58	1	No
R1020 Skyline at Barton Creek Apartments 2nd floor	B	67	60	62	2	No
R1021 Skyline at Barton Creek Apartments 3rd floor	B	67	63	65	2	No
R1022 Skyline at Barton Creek Apartments 2nd floor	B	67	61	62	1	No
R1023 Skyline at Barton Creek Apartments	B	67	57	58	1	No
R1024 Skyline at Barton Creek Apartments 3rd floor	B	67	63	65	2	No
R1025 Skyline at Barton Creek Apartments 2nd floor	B	67	61	62	1	No
R1026 Skyline at Barton Creek Apartments 3rd floor	B	67	63	65	2	No
R1027 Skyline at Barton Creek Apartments	B	67	57	59	2	No
R1028 Skyline at Barton Creek Apartments	B	67	57	59	2	No
R1029 Skyline at Barton Creek Apartments 2nd floor	B	67	61	63	2	No
R1030 Skyline at Barton Creek Apartments 3rd floor	B	67	64	65	1	No

## Traffic Noise Analysis Report

Representative Receiver	NAC Category	NAC Level	Existing	Predicted 2043	Change (+/-)	Noise Impact (Yes/No)
R1031 Skyline at Barton Creek Apartments 2nd floor	B	67	61	63	2	No
R1032 Skyline at Barton Creek Apartments 3rd floor	B	67	64	66	2	Yes
R1033 Skyline at Barton Creek Apartments	B	67	57	59	2	No
R1034 Skyline at Barton Creek Apartments 2nd floor	B	67	61	63	2	No
R1035 Skyline at Barton Creek Apartments 3rd floor	B	67	64	66	2	Yes
R1036 Skyline at Barton Creek Apartments	B	67	57	59	2	No
R1037 Skyline at Barton Creek Apartments	B	67	57	59	2	No
R1038 Skyline at Barton Creek Apartments 2nd floor	B	67	61	63	2	No
R1039 Skyline at Barton Creek Apartments 3rd floor	B	67	64	65	1	No
R1040 Skyline at Barton Creek Apartments	B	67	57	59	2	No
R1041 Skyline at Barton Creek Apartments 2nd floor	B	67	61	63	2	No
R1042 Skyline at Barton Creek Apartments 3rd floor	B	67	64	65	1	No
R1043 Skyline at Barton Creek Apartments	B	67	57	59	2	No
R1044 Skyline at Barton Creek Apartments 2nd floor	B	67	61	63	2	No
R1045 Skyline at Barton Creek Apartments 3rd floor	B	67	64	65	1	No
R1046 Skyline at Barton Creek Apartments	B	67	57	59	2	No
R1047 Skyline at Barton Creek Apartments 2nd floor	B	67	61	63	2	No
R1048 Skyline at Barton Creek Apartments 3rd floor	B	67	64	66	2	Yes
R1049 Skyline at Barton Creek Apartments	B	67	57	59	2	No

## Traffic Noise Analysis Report

Representative Receiver	NAC Category	NAC Level	Existing	Predicted 2043	Change (+/-)	Noise Impact (Yes/No)
R1050 Skyline at Barton Creek Apartments 2nd floor	B	67	61	63	2	No
R1051 Skyline at Barton Creek Apartments 3rd floor	B	67	64	66	2	Yes
R1052 Skyline at Barton Creek Apartments	B	67	57	59	2	No
R1053 Skyline at Barton Creek Apartments 2nd floor	B	67	62	63	1	No
R1054 Skyline at Barton Creek Apartments 3rd floor	B	67	64	66	2	Yes
R1055 Skyline at Barton Creek Apartments	B	67	58	59	1	No
R1056 Skyline at Barton Creek Apartments 2nd floor	B	67	61	63	2	No
R1057 Skyline at Barton Creek Apartments 3rd floor	B	67	64	66	2	Yes
R1058 Skyline at Barton Creek Apartments	B	67	57	59	2	No
R1059 Skyline at Barton Creek Apartments 2nd floor	B	67	61	62	1	No
R1060 Skyline at Barton Creek Apartments 3rd floor	B	67	64	65	1	No
R1061 Skyline at Barton Creek Apartments	B	67	57	58	1	No
R1062 Skyline at Barton Creek Apartments 2nd floor	B	67	60	62	2	No
R1063 Skyline at Barton Creek Apartments 3rd floor	B	67	63	64	1	No
R1064 Skyline at Barton Creek Apartments	B	67	57	58	1	No
R1065 Skyline at Barton Creek Apartments 2nd floor	B	67	60	62	2	No
R1066 Skyline at Barton Creek Apartments 3rd floor	B	67	63	64	1	No
R1067 Skyline at Barton Creek Apartments 2nd floor	B	67	60	62	2	No
R1068 Skyline at Barton Creek Apartments 3rd floor	B	67	62	64	2	No

<b>Representative Receiver</b>	<b>NAC Category</b>	<b>NAC Level</b>	<b>Existing</b>	<b>Predicted 2043</b>	<b>Change (+/-)</b>	<b>Noise Impact (Yes/No)</b>
R1069 Skyline at Barton Creek Apartments 4th floor	B	67	65	66	1	<b>Yes</b>
R1070 Skyline at Barton Creek Apartments 2nd floor	B	67	61	63	2	<b>No</b>
R1071 Skyline at Barton Creek Apartments 3rd floor	B	67	64	66	2	<b>Yes</b>
R1072 Skyline at Barton Creek Apartments 4th floor	B	67	67	68	1	<b>Yes</b>
R1073 Skyline at Barton Creek Apartments 2nd floor	B	67	61	63	2	<b>No</b>
R1074 Skyline at Barton Creek Apartments 3rd floor	B	67	64	66	2	<b>Yes</b>
R1075 Skyline at Barton Creek Apartments 4th floor	B	67	67	69	2	<b>Yes</b>
R1076 Skyline at Barton Creek Apartments 2nd floor	B	67	62	63	1	<b>No</b>
R1077 Skyline at Barton Creek Apartments 3rd floor	B	67	65	66	1	<b>Yes</b>
R1078 Skyline at Barton Creek Apartments 4th floor	B	67	68	69	1	<b>Yes</b>

As indicated in **Table 2**, the proposed project would result in a traffic noise impact at one or more representative receiver locations.

Noise abatement measures were considered for each location with predicted noise impacts.

## **Abatement Analysis**

Before any abatement measure can be proposed for incorporation into the project, it must be both feasible and reasonable. Feasibility and reasonableness considerations include constructability, the predicted acoustic reductions provided by an abatement measure, a cost allowance, and whether the adjacent receptors desire abatement. Receptors associated with an abatement measure that achieve a noise reduction of five dB(A) or greater are called benefited receptors.

In order to be "feasible," the abatement measure must benefit a minimum of two impacted receptors AND reduce the predicted noise level by at least five dB(A) at greater than 50% of first-row impacted receptors.

In order to be "reasonable," the abatement measure must also reduce the predicted noise level by at least seven dB(A) for at least one benefited receptor (noise reduction design goal) and not exceed the standard barrier cost of 1,500 square feet per benefited receptor. In addition, an abatement measure may not be reasonable if the construction costs are unreasonably high due to site constraints, as determined through an alternate barrier cost assessment.

The following noise abatement measures were considered: traffic management, alteration of horizontal and/or vertical alignments, acquisition of undeveloped property to act as a buffer zone, and the construction of noise barriers.

**Traffic management** – Control devices could be used to reduce the speed of the traffic; however, the minor benefit of one dB(A) per five mph reduction in speed does not outweigh the associated increase in congestion and air pollution. Other measures such as time or use restrictions for certain vehicles are prohibited on state highways.

**Alteration of horizontal and/or vertical alignments** – Any alteration of the existing alignment would displace existing businesses and residences, require additional right of way and not be cost effective/reasonable.

**Buffer zone** – The acquisition of undeveloped property to act as a buffer zone is designed to avoid rather than abate traffic noise impacts and, therefore, is not feasible.

**Noise barriers** – Noise barriers in the form of noise walls are the most commonly used noise abatement measures and were considered for this project.

Noise barriers would not be feasible and reasonable for any of the following impacted receptors, and therefore, are not proposed for incorporation into the project:

**R827** – This receiver represents approximately 6,000 square feet of impacted area along the Medspring Office trail, which was calculated assuming a trail width of 12 feet. A noise barrier at this location was not analyzed because using the representative lot size methodology, and an average lot size of 11,000 square feet, the impacted trail area was only equivalent to one receiver and therefore would not meet the feasible criteria of benefiting a minimum of two impacted receptors.

**R2682-R2685** – These receivers represent approximately 1,640 square feet of impacted area along the Barton Creek/Gaines Greenbelt/Twin Falls Trail, which was calculated assuming a trail width of 12 feet. A noise barrier at this location was not analyzed because using the representative lot size methodology, and average lot size of 11,000 square feet, the impacted trail area was only equivalent to one receiver and therefore would not meet the feasible criteria of benefiting a minimum of two impacted receptors.

**R2687-R2778 (CNE2)** – These receivers represent impacted 92 balconies in the Cliffs at Barton Creek apartment complex. A continuous noise barrier 22 feet in height and approximately 1,670 feet in length was modeled along the ROW. This barrier would not be sufficient to achieve the minimum feasible reduction of 5 dB(A) for a majority of impacted receptors. eight receptors while meeting the 7 dB(A) noise reduction design goal at one of those receptors. However, it did satisfy the noise reduction design goal of 7 dB(A) in at least on receptor. A noise barrier is not proposed at this location.

**R2779-R2806 (CNE3)** – These receivers represent 28 impacted balconies in the unnamed condominium complex along Capital Parkway and Holly Hills Drive. A continuous noise barrier would restrict access to these residences. Gaps in the noise barrier would satisfy access requirements, but the resulting non-continuous wall segments would not be sufficient to achieve the minimum, feasible reduction of 5 dB(A) for a majority of impacted receptors or the noise reduction design goal of 7 dB(A). Therefore, a noise barrier is not proposed at this location.

**R942-R1078 (CNE7)** – These receivers represent balconies in the Skyline at Barton Creek Apartment Complex, of which 26 were impacted. A continuous noise barrier up to 22 feet in height, placed along the ROW would not be sufficient to benefit a majority of the impacted receptors or meet the 7 dB(A) noise reduction design goal. Therefore, a noise barrier is not proposed for this location.

None of the above noise abatement measures would be both feasible and reasonable; therefore, no abatement measures are proposed for this project.

## Noise Contours for Land Use Planning

To avoid noise impacts that may result from future development of properties adjacent to the project, local officials responsible for land use control programs must ensure, to the maximum extent possible, that no new activities are planned or constructed along or within the following predicted (2043) noise impact contours.

Land Use	Impact Contour	Distance from Right of Way
NAC category B & C	66 dB(A)	320 feet
NAC category E	71 dB(A)	35 feet

## Construction Noise

Noise associated with the construction of the project is difficult to predict. Heavy machinery, the major source of noise in construction, is constantly moving in unpredictable patterns. However, construction normally occurs during daylight hours when occasional loud noises are more tolerable. None of the receptors are expected to be exposed to construction noise for a long duration; therefore, any extended disruption of normal activities is not expected. Provisions will be included in the plans and specifications that require the contractor to make every reasonable effort to minimize construction noise through abatement measures such as work-hour controls and proper maintenance of muffler systems.

## Local Official Notification and Date of Public Knowledge Statement

A copy of this traffic noise analysis will be available to local officials. On the date of the environmental decision for this project (Date of Public Knowledge), FHWA and TxDOT are no longer responsible for providing noise abatement for new development adjacent to the project.

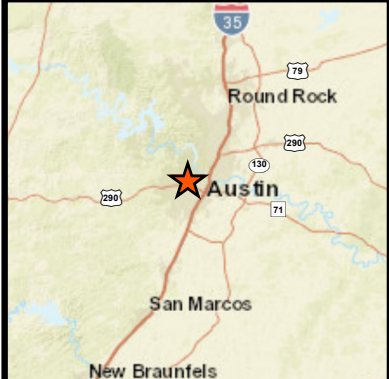
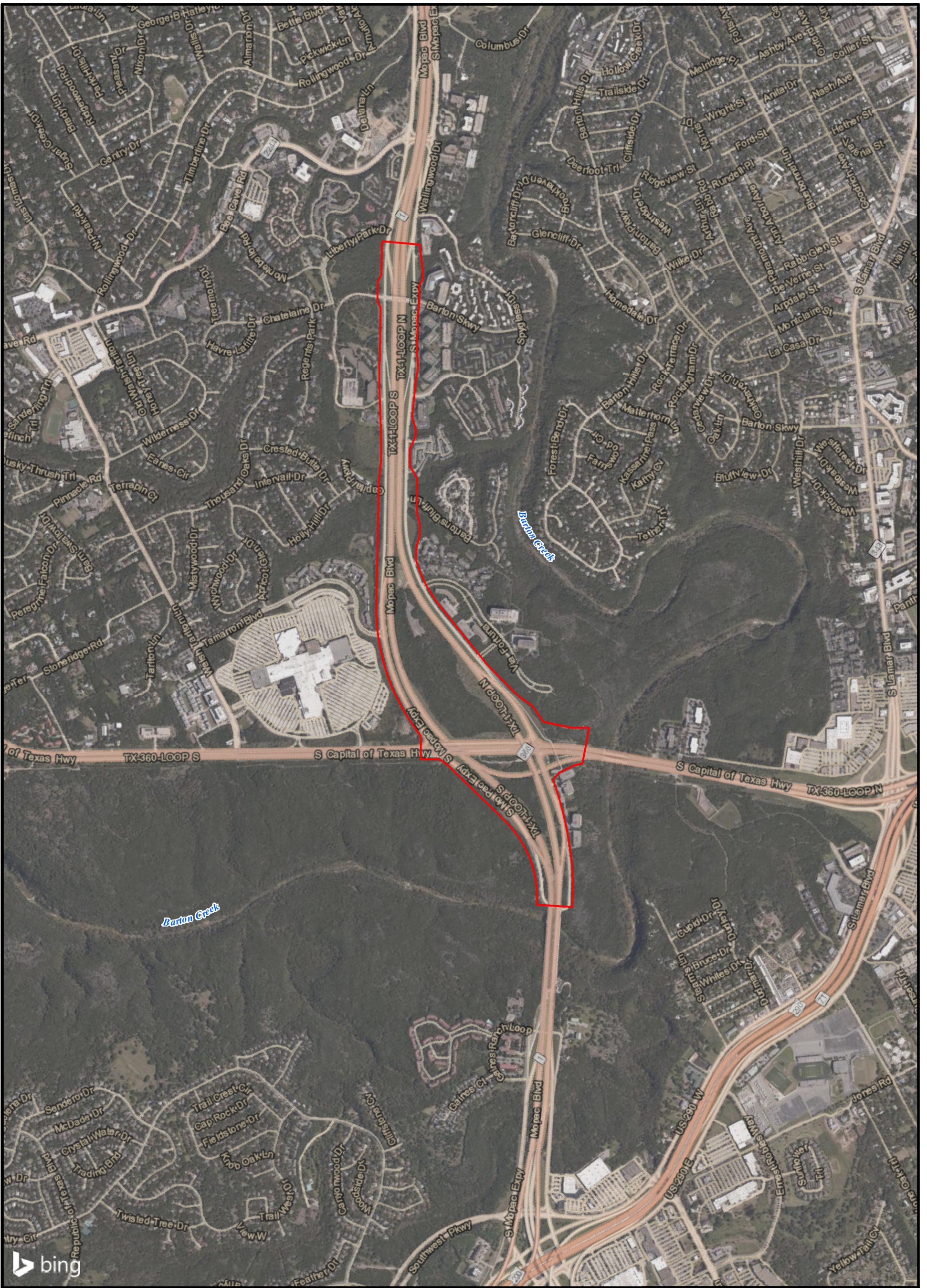
## List of Attachments

- A. Project Location Map
- B. Traffic data
- C. Existing model validation study
- D. Map figures

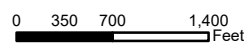


**Attachment A**  
**Project Location Map**

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 Existing ROW



**ATKINS**

Member of the SNC-Lavalin Group

**Barton Skyway Project Location Map**

Central Texas Regional Mobility Authority

Travis County, Texas

Date: May 18, 2021

Scale: 1" = 1,400'

N:\Clients\C\_D\CTRA\Barton\_Skyway\geofigures\CR\BSkyway\_CR\_vicinity\_v2.mxd

**Attachment B**  
**Traffic Data**

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# Corridor Traffic Forecast Methodology: Barton Skyway Ramp Relief Project

## Introduction

This document outlines the methodology that will be used to develop traffic forecasts for the Barton Skyway Ramp Relief Project in the Austin, Texas metropolitan area. The traffic forecasts will be developed for the MoPac Expressway (Loop 1) corridor from Barton Skyway to Loop 360 in southbound direction only. The proposed project improvements include:

- Southbound auxiliary lane from Barton Skyway to Loop 360
- Acceleration lane for the southbound Barton Skyway entrance ramp
- Three dedicated through-traffic lanes at Loop 360
- Dedicated left lane exit ramp for southbound Loop 360

This project is being administered by the Central Texas Regional Mobility Authority (CTRMA) in cooperation with the Austin District of the Texas Department of Transportation (TxDOT). This document outlines the approach that will be used to develop corridor traffic forecasts that will serve as an input to traffic capacity analyses and environmental studies for project-level air quality and noise analyses.

## Sources of Traffic Counts

A comprehensive traffic count data collection effort, collected as part of MoPac South express lanes project, was conducted in February and March of 2018 along the MoPac Expressway and along selected screenlines. The data collection effort included the main lane segments and ramps along the MoPac Expressway and connecting freeways and major streets, frontage roads, and u-turn ramps. The count program included vehicle classification counts, and seven-day counts at select locations to supplement other sources and to seasonally adjust the traffic counts to represent AADT (annual average daily traffic). Non-classification counts were collected using tube counters. Mainlane counts, major arterial counts and all classification counts were collected using video cameras.

Origin-destination (O-D) and speed data was also collected along the corridor during this time period. In addition, CTRMA provided traffic counts, traffic operations and toll transaction data for the MoPac North Express Lanes. All this data is an important component of the model calibration for the express lanes, and provides demand, OD and congestion profiles for sections of MoPac Expressway general purpose lanes and ramps throughout the corridor.

## Source of Historical Traffic Trends

Annual historical on-system counts between 2000 and 2018 will be provided as part of the Consultant Corridor Packet by the TxDOT Transportation Planning and Programming (TPP) Division to evaluate long-term growth trends along the corridor. Additional daily traffic counts also available from TxDOT, including permanent and classification counts, will be used in day-of-week and seasonal traffic adjustments, and in estimating truck percentages.

## Source of Traffic Forecasts

CTRMA has developed a corridor-level calibrated travel demand model of the Mopac South corridor using the 2040 Capital Area Metropolitan Planning Organization (CAMPO) travel demand model (the “CAMPO Model”) as a base as part of previous work on the Mopac South Project. Given that the Barton Skyway Ramp Relief Project is an independent short-term localized auxiliary lane project and not a full corridor project, this corridor-level model is the most accurate representation of traffic patterns on the corridor, thus more accurate than the regional CAMPO 2045. Key information included in the 2040 corridor model includes accurate representation of peak period ramp traffic patterns and origin-destination patterns among general purpose and managed lane components of the corridor, which are critical to the accuracy of the forecast. In addition, the CAMPO 2045 Plan network would only be needed for an air quality analysis. However, an air quality analysis is not needed for the Barton Skyway Ramp Relief Project since it is a localized widening project.

The 2040 CAMPO Model is calibrated to a 2010 base year and provides forecasts for the year 2040. A corridor-specific version (the “Corridor Model”) of the 2040 CAMPO Model will be calibrated to year 2018 traffic conditions for use in conducting environmental studies, estimating traffic volume and growth trends for the project level traffic forecasts. Since the calibration will be focused on the MoPac Expressway corridor and will be based on a more comprehensive traffic count effort, the Corridor Model will provide a more accurate representation of current corridor traffic patterns, and thus will provide more accurate annual growth trends for the development of project traffic forecasts.

In addition, the Corridor Model will be updated with all applicable projects from the CAMPO’s long-range 2040 Metropolitan Transportation Plan (*CAMPO 2040 Plan*) – adopted in Spring 2015 along with subsequent amendments, except for the proposed MoPac South express lanes project. Since the Mopac South improvement will replace the Barton Skyway Project, it is assumed for this analysis that the MoPac South express lanes project will not be built.

## Project Forecast Methodology

The project traffic forecast methodology will follow the procedure used by Transportation Planning and Programming (TPP). The methodology includes the following steps:

1. The daily traffic count data will be assembled from all available sources to supplement the corridor traffic count program. These traffic counts will be adjusted as necessary referring other years’ data sources to develop a base year (2018) traffic count pattern of the freeway lanes, ramps, frontage roads, cross roads and u-turn ramps. The 2018 traffic volumes will be estimated for the segments in between the available count locations. For the missing traffic counts for minor side roads and driveways, traffic volumes will be estimated based on a review of land use and trip generation information, available TxDOT count data and other counts.
2. A simplified, out-of-scale stick representation of the existing project corridor will be coded into a travel demand model highway network including the highway main lanes, ramps, frontage roads, u-turn lanes, cross roads and relevant minor streets and driveways along the project corridor. The stick diagram will include the relevant sequence of all ramp connections. Road segments will be classified for visualization purposes and selected name labels will be added to network links for reference and will be used on forecast plots. The 2018 traffic counts will be added to all segments, including estimates of minor external feeder roadways and driveways.

3. After calibration of the Corridor Model, the 2018 corridor travel demand model forecast volumes will be coded into the existing conditions segments of the project corridor stick diagram as described above. This data will represent the 2018 base year traffic volume estimates for a No-Build scenario.
4. Changes to the number of lanes within the project limits will be coded to the corridor stick diagram that represents the changes to the existing corridor configuration resulting from the proposed project.
5. The 2040 Corridor Model travel demand forecast volumes will be coded into the future conditions' segments of the project highway network.
6. The annual average daily traffic (AADT) growth rate will be computed using the 2018 and 2040 Build travel demand model forecasts. Using travel demand model computational tools, the model-estimated ADT growth from 2018 to 2040 will be divided by 22 years. This will provide the estimated annual growth for the Build scenario based on actual travel demand model forecasts. The annual growth levels will be rounded among project segments to the nearest 100 vehicles per year wherever possible, or the nearest 50 vehicles per year as necessary. These rounded growth trends will be further adjusted as necessary to ensure no negative or zero growth occurred unless warranted by a noted traffic diversion pattern resulting from the new project configuration. All annual growth levels will be normalized to ensure continuity between segments at junctions and intersections.
7. Annual growth estimates will be added for minor roadways that are not in the travel demand model based on potential for development, background growth, or other sources.
8. A growth rate for a No-Build traffic scenario will be computed using the calibrated 2018 and 2040 No-Build travel demand model forecasts.
9. Future forecasts for Build and No-Build conditions will be computed for an opening year 2023 and a horizon year 2043 by adding the annual growth trend multiplied by the number of years to the 2018 traffic counts.
10. The forecast plots of the corridor highway network will be developed in a PDF format to illustrate traffic counts, traffic forecasts, annual growth trends, and other visualizations to help accelerate the process of understanding the forecast process and results for review and comment by TPP Division.

### Daily and Design Hour Traffic Factors

Traffic data for select locations, including ADT, truck percentage, K and D factors, were received as part of the Corridor Consultant Packet (attached here with the methodology document). Future traffic data will be developed based on the information collected from the corridor and available vehicle classification and automatic traffic recorder counts from TxDOT (received as part of Consultant Corridor Packet). This information will be used to determine the design-hour traffic factors (K and D factors) used to estimate directional design-hour volumes from daily forecasts, and a breakdown of the proportion of single-unit and tractor-trailer trucks that occur during the design-hour and on a daily level. The above information is deemed to be sufficient to conduct environmental and traffic design studies.



# MEMO

April 5, 2021

**To:** Harold L Ferguson Jr., P.E., District Engineer  
Attention: Heather D Ashley-Nguyen P.E., Director of TPD

**Through:** Roger A Beall, P.E.  
Deputy Director, TPP Division

DocuSigned by:  
*Roger A. Beall, P.E.*  
B16290EACC44498...

**From:** Larry Alaka  
Planner, TPP

**Subject:** Traffic Data  
CSJ: 3136-01-193  
SL 1 (Mopac)  
From: Barton Skyway  
To: SL 360

Travis County

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Attached is a corridor analysis information packet for the described limits of the route

Please refer to your original request dated March 17, 2021.

If you have any questions or need additional information, please contact Gabe Contreras at (512) 486-5180.

Attachments

**CC:** Matthew Cho, P.E.  
Transportation Engineer  
Austin District  
Design Division

## Traffic Data Request Form

**Request ID**  
(auto generated on save)

**Date Created**  
(auto generated on save)

<b>County</b>	<input type="text" value="Travis"/>
<b>District</b>	<input type="text" value="Austin"/>
<b>CSJ</b>	<input type="text" value="3136-01-193"/>
<b>Project Highway</b>	<input type="text" value="SL 1 (Mopac)"/>
<b>Limit From</b>	<input type="text" value="Barton Skyway"/>
<b>Limit To</b>	<input type="text" value="SL 360"/>
<b>Number of Lanes Existing</b>	<input type="text" value="6"/>
<b>Number of Lanes Proposed</b>	<input type="text" value="7"/>
<b>District Contact Person</b>	<input type="text" value="Matthew Cho"/>
<b>Contact Number</b>	<input type="text" value="512-865-7945"/>
<b>Estimated Letting Date</b>	<input type="text" value="6/2/22"/>
<b>District Priority</b>	<input type="text" value="1"/>



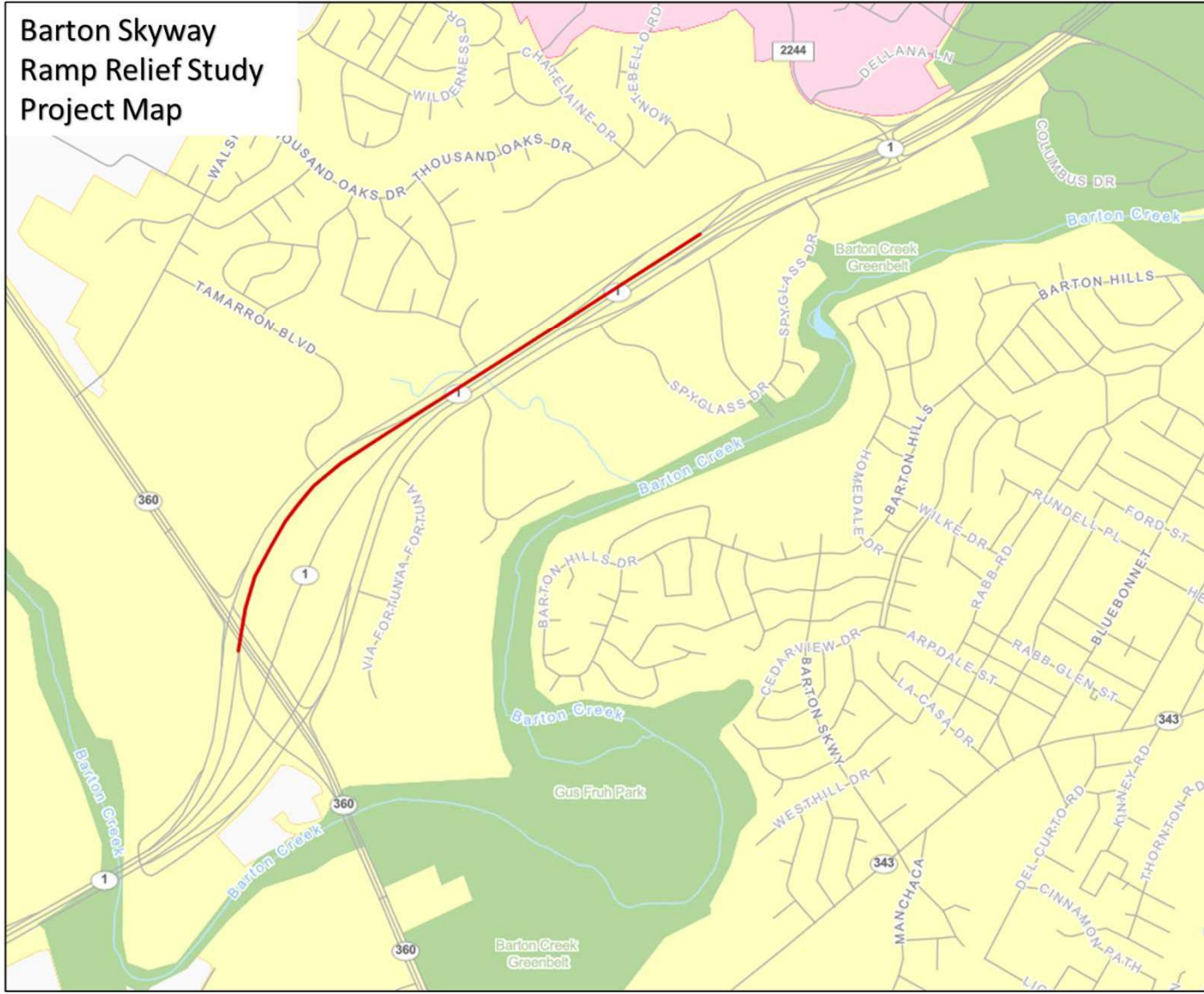
<p><b>Attach Drawings or other documents</b></p>	<p>2020-01-03_BSRR Exhibit.pdf (/sites/division-tpp/TransportationAnalysisRequest/Lists/Traffic Data Request/Attachments/2698/2020-01-03_BSRR Exhibit.pdf)</p> <p>3136-01-193_Form 2124.pdf (/sites/division-tpp/TransportationAnalysisRequest/Lists/Traffic Data Request/Attachments/2698/3136-01-193_Form 2124.pdf)</p>		
<p><b>Special Instructions</b> (Please include applicable special instruction details such as:</p>			<p>The location map can be seen in Page 2 of the Form 2124 attachment. The Line Diagram can be seen in Page 3 of the Form 2124 attachment. The limits of this request is within the completed CSJ 3136-01-176 project so a request has been made to see if the data can be updated from the previous analysis.</p>
<ul style="list-style-type: none"> <li>• Proposed land use information</li> <li>• High volume truck area</li> <li>• Main lane and frontage road ESAL separation)</li> </ul>			
<p><b><i>The following to be completed (Please mark information to be provided)</i></b></p>			
<p><b>1. Basic highway traffic data for pavement design</b></p>			

<b>A. Open to Traffic Year</b>	<input type="text" value="2023"/>	
<b>B. Forecasted 20 Years</b>	<input checked="" type="checkbox"/>	
	<input type="text" value="2043"/>	
<b>C. Forecasted 30 Years</b>	<input checked="" type="checkbox"/>	
	<input type="text" value="2053"/>	
<b>D. Directional Distribution</b>		
<b>E. K-factor</b>		
<b>F. Percent Trucks ADT/DHV</b>		
<b>G. Average Ten Heaviest Wheel Loads (ATHWLD)</b>		
<b>H. Percent Tandem Axles in the ATHWLD</b>		
<b>I. Equivalent Single Axle Load data (ESALs)</b>		
<b>J. Slab Thickness(8" unless otherwise specified)</b>	<input type="text" value="8"/>	
<b>K. Structural Number(3" unless otherwise specified)</b>	<input type="text" value="3"/>	

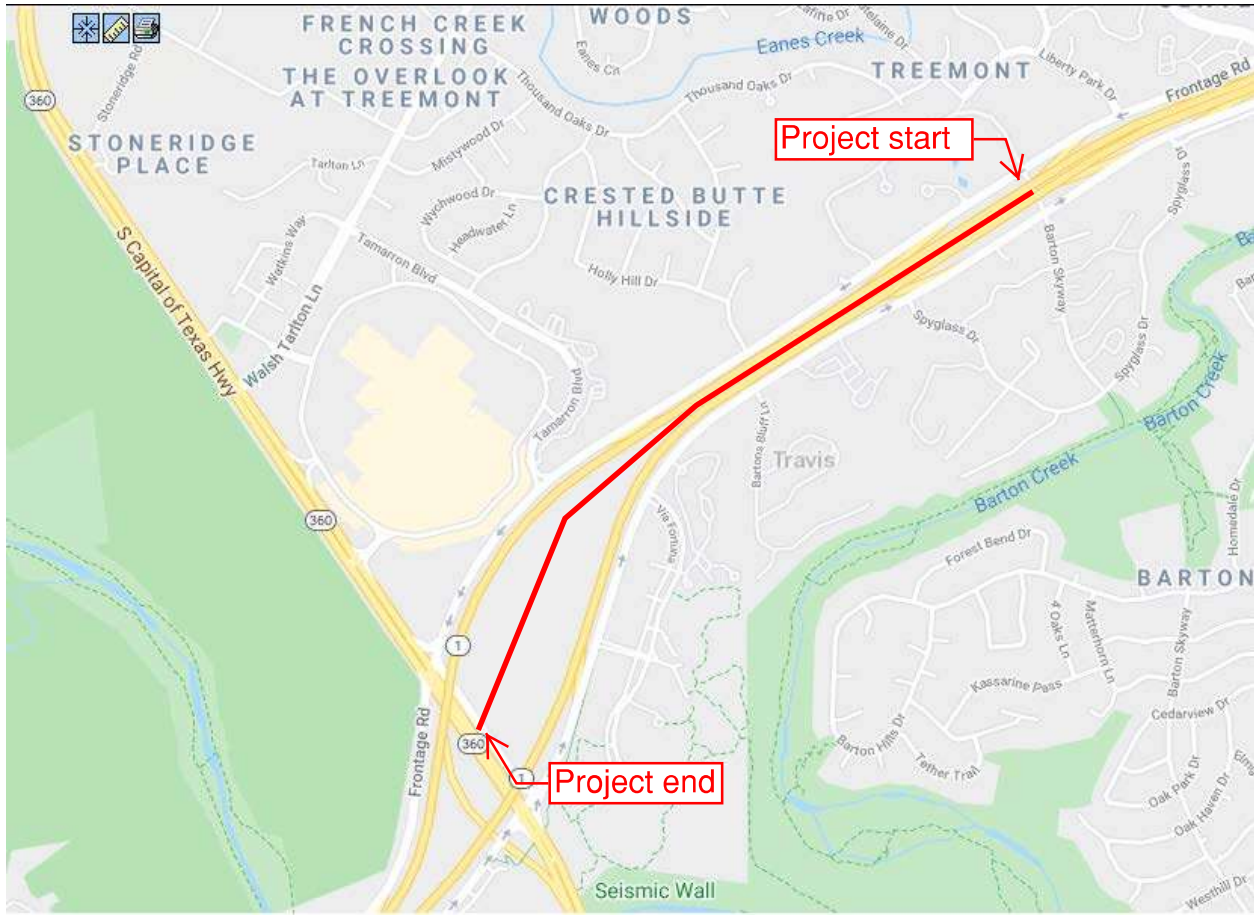
<b>2. Vehicle Classification for environmental studies (Air and Noise Analysis)</b>	<input checked="" type="checkbox"/>	
<b>3. Line Diagram Analysis (straight line turning movements: please provide line diagram)</b>	<input type="checkbox"/>	

<p><b>4. Complete Corridor analysis (includes basic highway traffic data for pavement design and environmental studies and detailed schematic turning movements; please provide detailed) schematic</b></p>	<input type="checkbox"/>
<p><b>5. Consultant Corridor Information Packet</b></p>	<input checked="" type="checkbox"/>
<p><b>6. Methodology Review</b></p>	<input type="checkbox"/>
<p><b>7. No build Traffic Analysis</b></p>	<input type="checkbox"/>

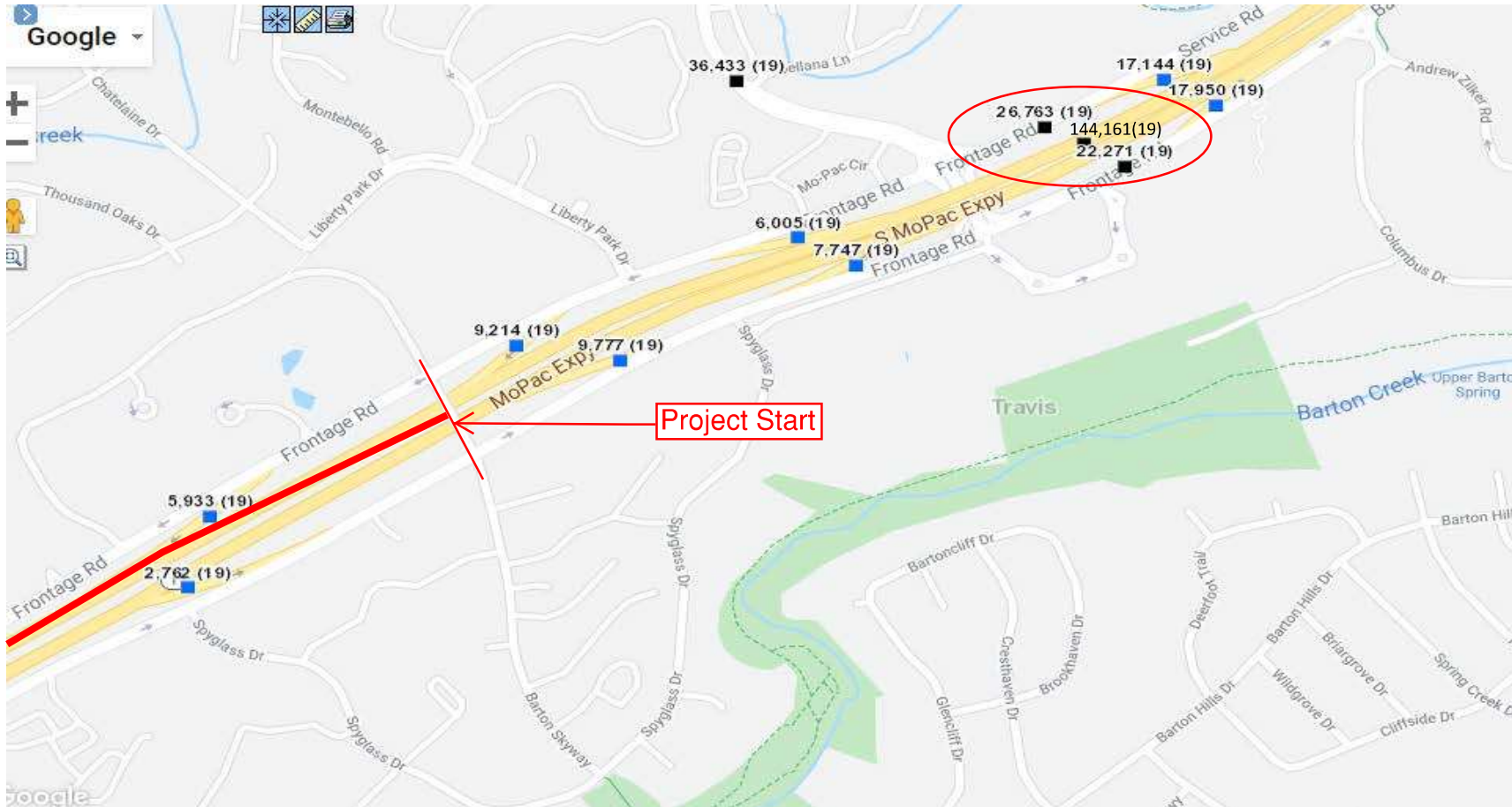
# District Location Map



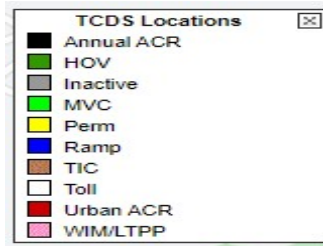
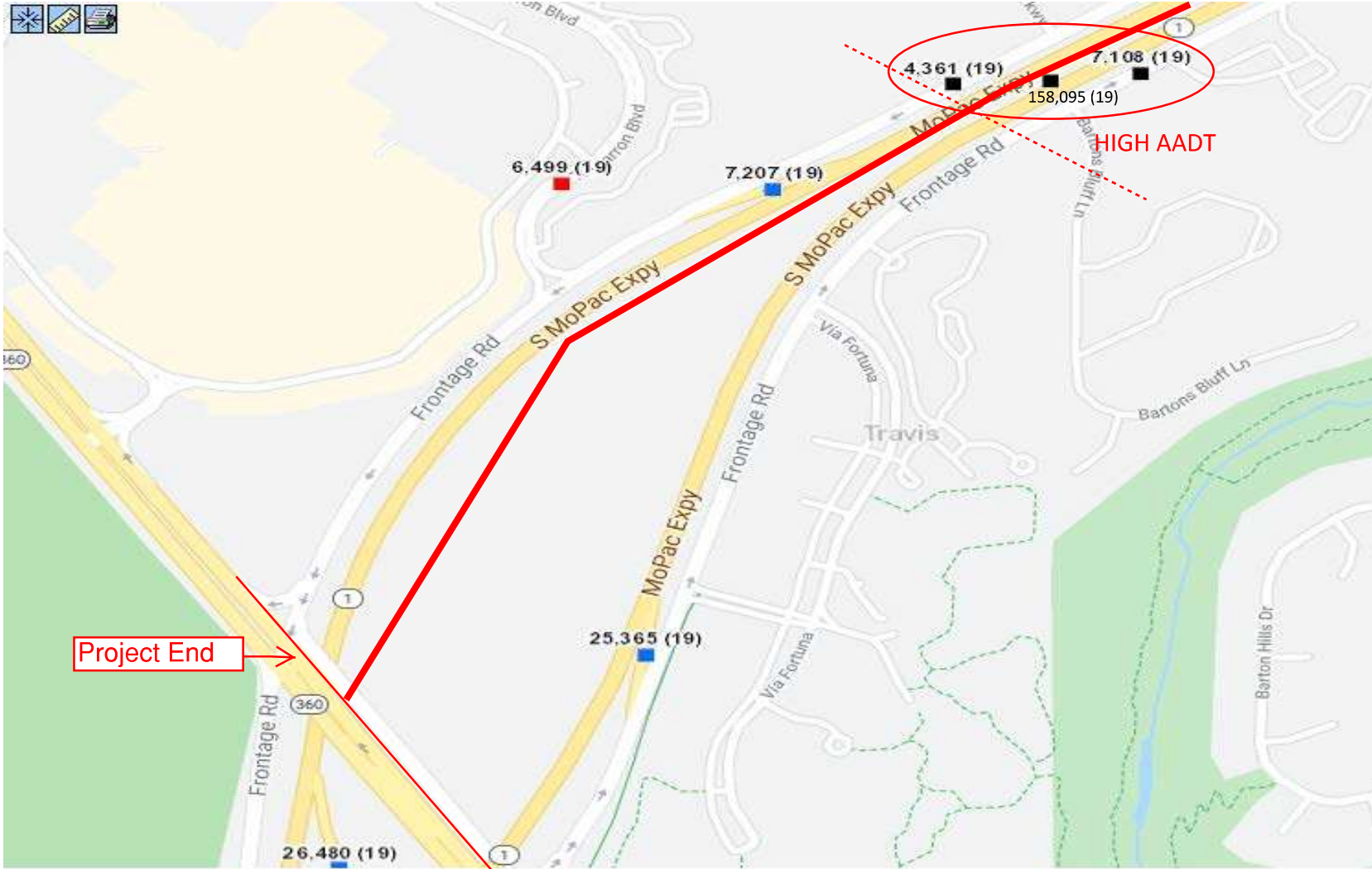
### Project Location Map



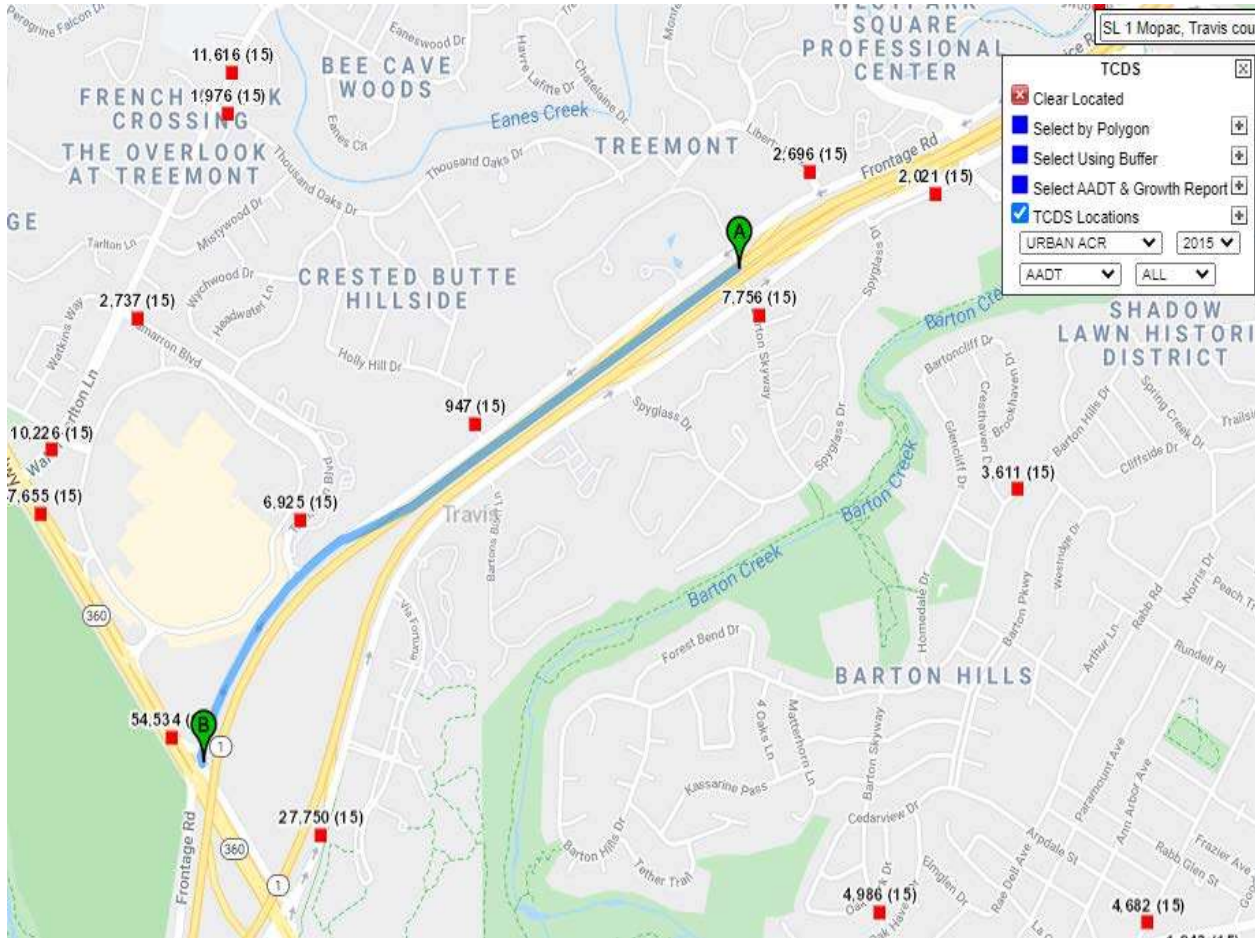
### 2019 STARS II Annual ACR & Ramp Count Map 1 of 2



Map 2 of 2

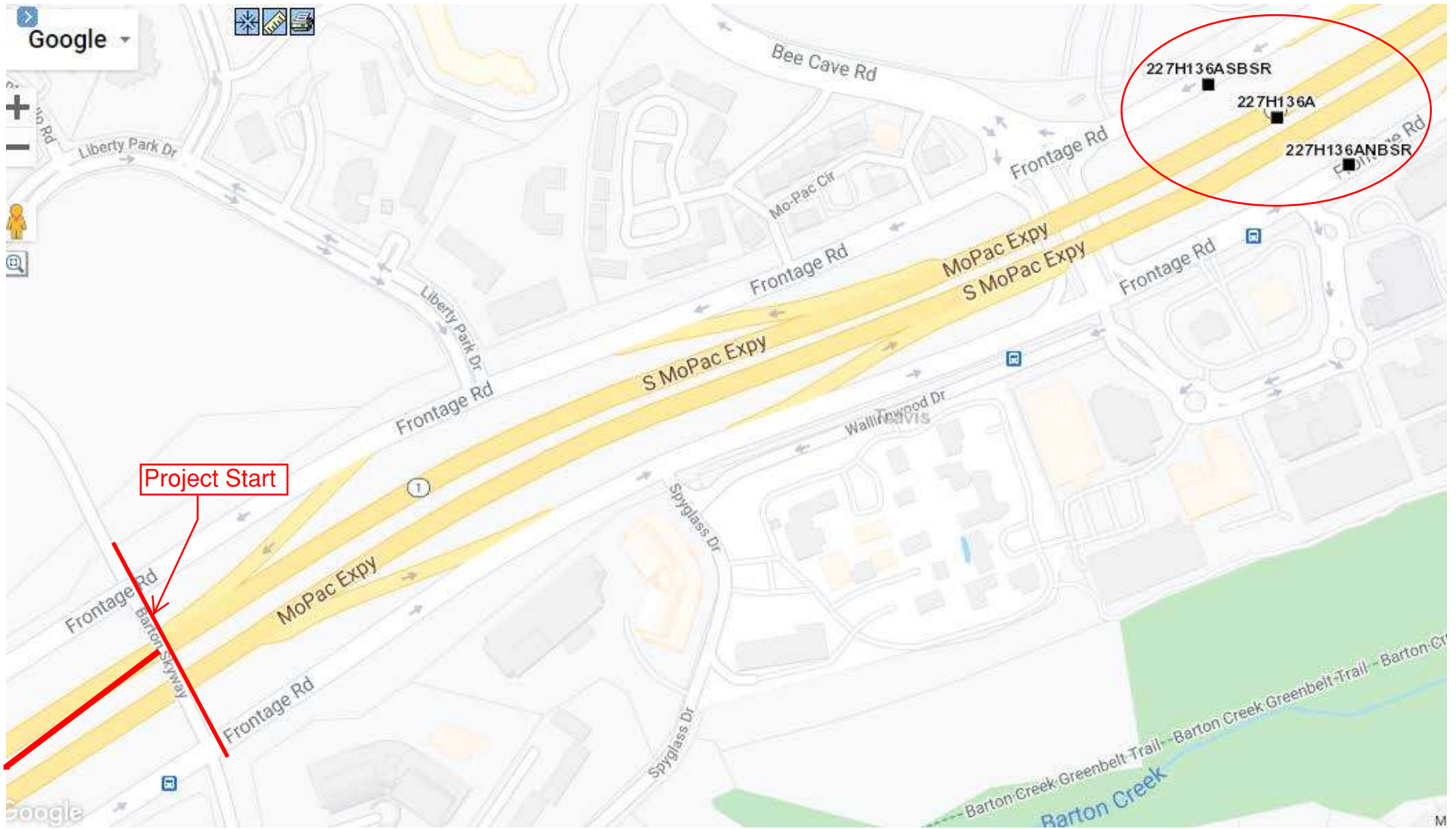


### Urban ACR

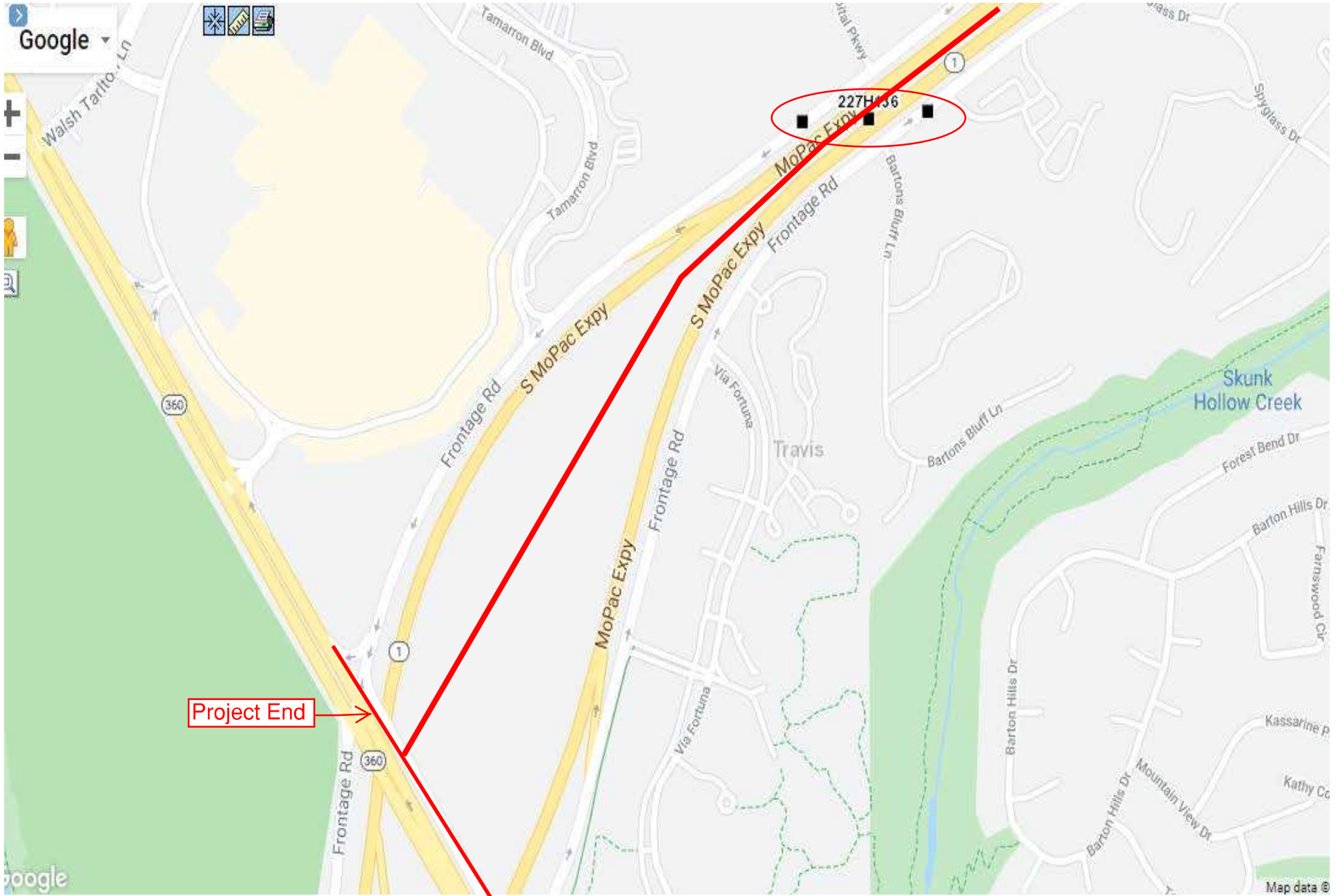




**Station ID**  
**Map 1 of 2**



Map 2 of 2



**Corridor Analysis Worksheet: 1 Section, 2 Forecast Years, Air & Noise**

Project	SL 1 (Mopac)		District	Austin			
Rd Type	SL		County	Travis			
Direction	Two-Way		CSJ	3136-01-193			
Project Limits	From: Barton Skyway To: SL 360		Analyst	LA			
Date: Request	3/17/2021	Received	3/17/2021	Started	3/30/2021	Completed	3/31/2021
District Contact	Matthew Cho, P.E		Phone #	512-865-7945			

Year	ADT's	% Trks ADT	% Trks DHV
Count 2019	169564	<b>2.2</b>	<b>1.7</b>
Base 2023	<b>183100</b>	# Trks <b>4028</b>	
Forecast 2043	<b>286000</b>		
Forecast 2053	<b>284900</b>		

SPR Station	S-209	MC Stn	MS 209	% Trks	2.4
Year	2019	Dir	2-WAY	Num Trks	3842
Peak Hour	9.0	Year	2019	Axle Factor	2.18
DD	55	ADT	162098	% Single Axles	0.80
100-DD	<b>45</b>				
K-Factor	8.7				

Main Road Growth Rate	2.0	TDM Assignment	N/A
Growth Rate after 20 Years	2.0		
20 Year Growth Factor	<b>2.810</b>		
30 Year Growth Factor	<b>1.853</b>		
Design Period 1	20		
Design Period 2	30		

LOD 99999

Structural Number (SN)	3	Existing	6
Slab Thickness (ST)	8	Proposed	7

Past Projects	
Project	Covid
From	
To	
Date	
County	
CSJ	

Items Done on This Project			
Straight Line Turning Movements	no	Detailed Schematic Turning Movements	no
Traffic Analysis for Highway Design	yes	Field Trip	no
Vehicle Mix	yes	Travel Demand Model Used	no
Manual Count Worksheet	yes		

**NOTES:**  
The traffic projections provided are "DRAFT" volumes to be used as a guide for the project. For general forecasting purpose, this represents the highest point within the project limits.

**DATA CALCULATIONS FOR USE IN AIR & NOISE ANALYSIS**

FHWA Format Vehicle Class. Counts		
<b>Light Duty Vehicles</b>	Motorcycles	97
	Passenger	130690
	Pickup or Van	27469
<b>Single Units</b>	Buses	399
	Other 2 Axle	2312
	3 Axles	395
	4 Axles or more	57
<b>Truck Combs.</b>	3-4 Axles	101
	5 Axles	567
	6 Axles or more	8
<b>Semi-Trailer-Trailer</b>	5 Axles or less	2
	6 Axles	1
	7 Axles or more	0

	Number	%
Light	<b>158256</b>	<b>97.6</b>
Medium	<b>2761</b>	<b>1.7</b>
Heavy	<b>1081</b>	<b>0.7</b>
Trucks	<b>3842</b>	<b>2.4</b>
<b>SECTION 1</b>		
<b>SL</b>		
	<b>ADT</b>	<b>DHV</b>
Light	<b>97.8</b>	<b>98.3</b>
Medium	<b>1.6</b>	<b>1.2</b>
Heavy	<b>0.6</b>	<b>0.5</b>
Total Vehicles		<b>162098</b>
Total Trucks		<b>3842</b>
Total Singles		<b>6715.5</b>
Total Tandems		<b>1653.5</b>
AXLE FACTOR		<b>2.18</b>
SINGLE AX FACT		<b>0.80</b>

**INPUT DATA FOR KIPS: AUTOMATIC**

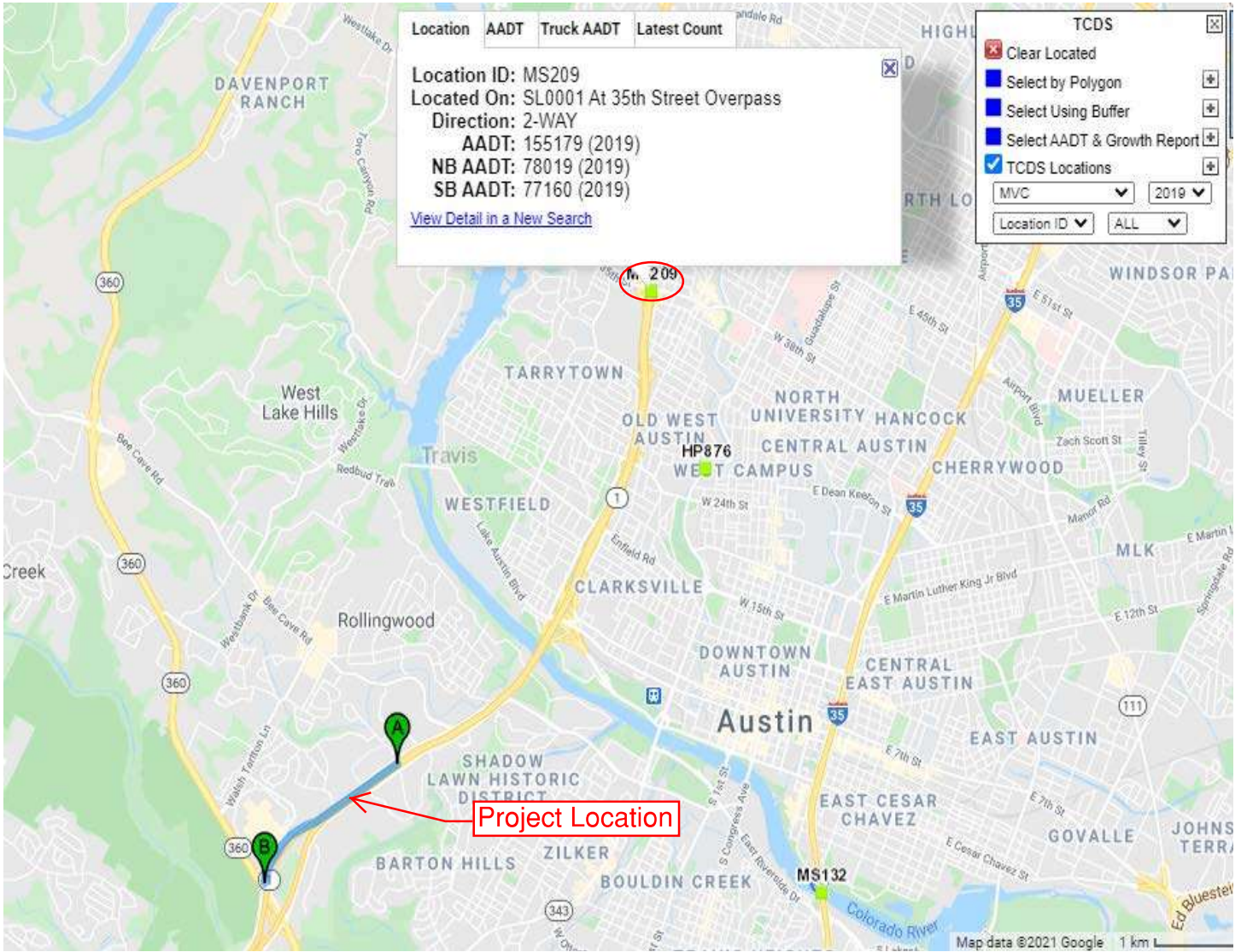
SN, ST	3, 8				
Design Periods	1	2			
Year 1	23	23			
Year 2	43	53			
ADT	183100	183100			
% Trks	2.2	2.2			
Growth Rate	2.810	1.853			
Years	20	30			
Facil Type					
S.N.	3	3			
SLAB	8	8			
Weight Sta	99999	99999			
Axle Factor	2.18	2.18			
Single Axle	0.80	0.80			

**OUTPUT DATA FROM KIPS: ENTER FOR TAHD FORM**

SN, ST	3, 8				
Design Periods	1	2			
ATHWLD					
% T in ATHWLD					
FLEXIBLE					
RIGID					



### MVC Location Map



### Manual Count Design Data

## MANUAL COUNT DESIGN DATA - FHWA FORMAT

Station Number MS 209 Direction 2-WAY Year 2019  
 Optional Misc. Info. (loc., etc.) \_\_\_\_\_

Type of Truck		Number of Trucks	Single Axles		Tandem Axle Sets	
Single Units			Mult.	Mult.	Mult.	Mult.
Buses	4	399	2	798	0	0
2-D	5	2312	2	4624	0	0
3-Axle	6	395	1	395	1	395
4-Axle	7	57	1	57	1	57

Single Trailer						
3-4-Axle	8	101	2.5	252.5	0.5	50.5
5-Axle	9	567	1	567	2	1134
6-Axle	10	8	1	8	2	16

Multi-Trailers						
5-Axle	11	2	5	10	0	0
6-Axle	12	1	4	4	1	1
7-Axle	13	0	3	0	2	0

Total      3842      6715.5      1653.5

(Singles + Tandems) / Total Trucks = Axle Factor	2.18
(Singles Axles / (Singles + Tandems))	0.80

Print Results

Return to corridor worksheet

<b>Light Duty Vehicles</b>	Motorcycles	97
	Passenger Cars	130690
	Pickup or Van	27469
<b>Single Units</b>	Buses	399
	Other 2 Axle	2312
	3 Axles	395
	4 Axles or more	57
<b>Single Trailer</b>	3-4 Axles	101
	5 Axles	567
	6 Axles or more	8
<b>Multi-Trailers</b>	5 Axles or less	2
	6 Axles	1
	7 Axles or more	0

<b>Light</b>	158256
<b>Medium</b>	2761
<b>Heavy</b>	1081
<b>Trucks</b>	3842
<b>Total Vehicles</b>	162098
<b>% T of Tot. Veh.</b>	2.4
<b>Num. of Trucks</b>	3842
<b>Axle Factor</b>	2.18
<b>% Single Axles</b>	0.80


## MVC Classification Report

## Classification Report

Location ID	MS209	Located On	SL0001	County	Travis
Counted By	TCDS_Combined		At 35th Street Overpass	Community	Austin
Start Date	Tue 12/17/2019	Loc On Alias	SL0001-KG	Station	
Start Time	12:00:00 AM	Direction	2-WAY	Agency	Texas DOT
Source	TCDS_BIN_IMPORT_COMBINE	Sensor Type		Owner	Karen.Cohrach
Axle Factor	0.993	Count Status	Accepted		
Filename					

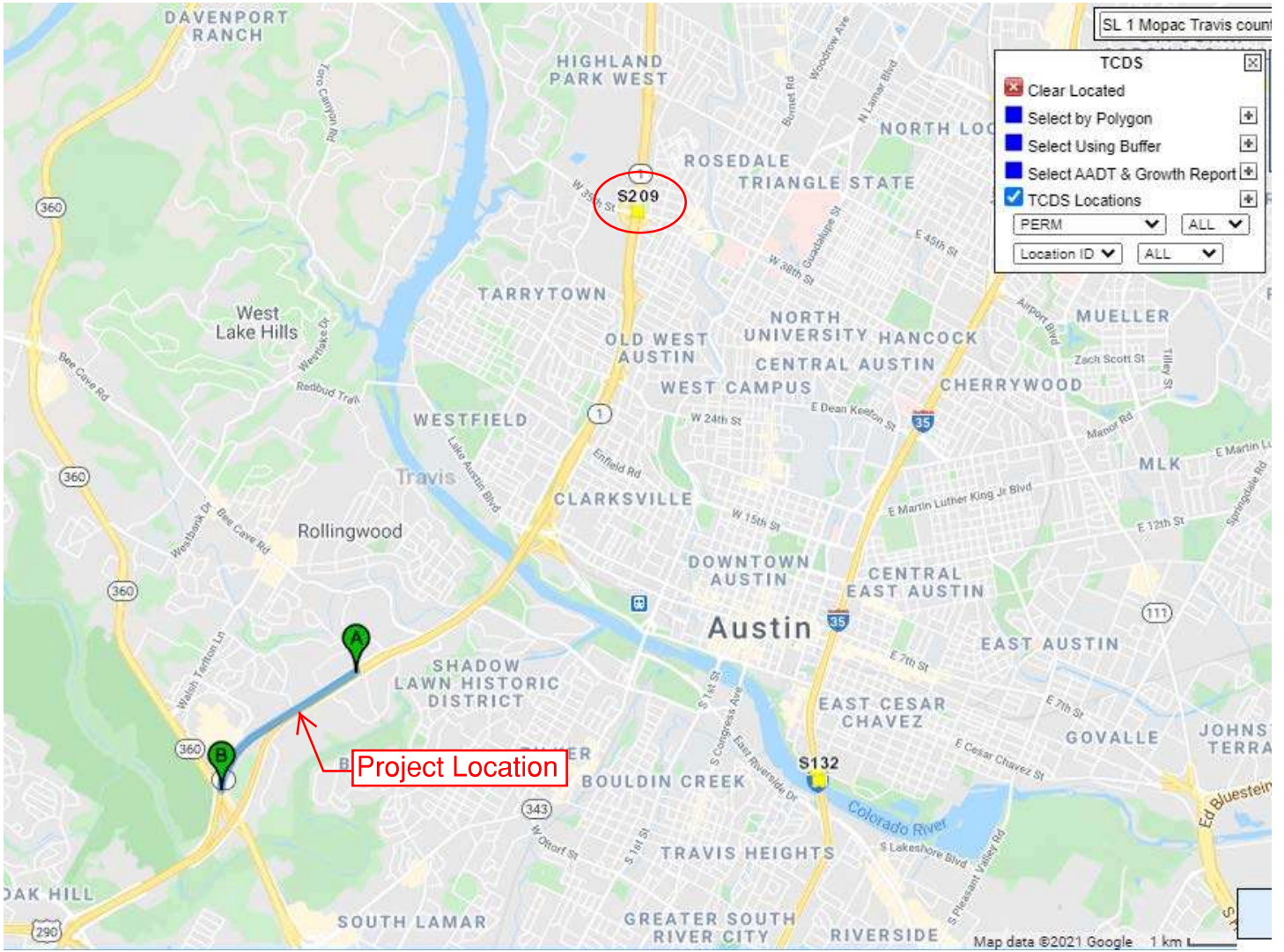
Directions: **2-WAY**  NB  SB 

Count Navigation:     Count Type:  

FHWA-Scheme F Classification 																
Start Time	Motor cycle	Car	Pick up	Bus	2A SU	3A SU	>3A SU	<5A 2U	5A 2U	>5A 2U	<6A >2U	6A >2U	>6A >2U	14	15	TOTAL
12:00 AM	4	480	99	2	10	2	0	0	8	0	0	0	0	0	0	605
1:00 AM	0	372	77	1	7	2	0	0	12	0	0	0	0	0	0	471
2:00 AM	0	252	54	1	8	1	0	1	21	0	0	0	0	0	0	338
3:00 AM	0	245	56	0	15	9	0	1	14	0	0	0	0	0	0	340
4:00 AM	0	502	146	5	17	6	0	3	32	0	0	0	0	0	0	711
5:00 AM	4	2055	487	5	34	8	0	4	23	0	0	0	0	0	0	2620
6:00 AM	5	6997	1590	23	131	33	7	9	25	0	0	0	0	0	0	8820
7:00 AM	10	10513	2029	41	143	34	10	8	18	1	0	0	0	0	0	12807
8:00 AM	3	10656	1962	38	193	28	3	6	23	1	0	0	0	0	0	12913
9:00 AM	6	9804	2162	48	250	33	9	9	38	1	0	0	0	0	0	12360
10:00 AM	4	7827	1757	23	250	46	3	8	46	2	0	0	0	0	0	9966
11:00 AM	9	8205	2113	13	213	34	3	6	37	0	0	0	0	0	0	10633
12:00 PM	5	8418	1998	17	205	35	6	6	35	1	0	0	0	0	0	10726
1:00 PM	12	7923	1898	17	161	37	5	13	34	0	0	0	0	0	0	10100
2:00 PM	11	8225	2014	19	149	30	7	9	37	2	0	0	0	0	0	10503
3:00 PM	6	8241	2012	30	127	18	4	3	35	0	0	0	0	0	0	10476
4:00 PM	0	5444	1134	21	88	8	0	1	11	0	0	0	0	0	0	6707
5:00 PM	5	5634	1161	33	78	12	0	4	10	0	0	0	0	0	0	6937
6:00 PM	7	7034	1373	26	79	6	0	4	18	0	0	0	0	0	0	8547
7:00 PM	2	7011	1174	12	50	5	0	0	6	0	0	0	0	0	0	8260
8:00 PM	1	5067	805	7	47	4	0	0	10	0	0	0	0	0	0	5941
9:00 PM	2	4776	680	6	21	0	0	3	20	0	1	0	0	0	0	5509
10:00 PM	1	3490	480	6	23	3	0	2	31	0	0	1	0	0	0	4037
11:00 PM	0	1519	208	5	13	1	0	1	23	0	1	0	0	0	0	1771
TOTAL	97	130690	27469	399	2312	395	57	101	567	8	2	1	0	0	0	162098



### SPR Location Map





Transportation Planning and Programming Division's  
Statewide Traffic Analysis and Reporting System II

**High Hourly Volumes for Year for 1/1/2019 - 12/31/2019**

**District :** Austin

**County :** Travis

**Community :** Austin

**Route:**

**On Road:** SL0001

**Location ID :** S209

**Collection Type :** PERM

**AADT:** 155,179

**Roadbed :** ML

Ordinal High Hour	Date	Day of Week	Hour	Volume	K Factor	Peak Direction	Directional Distribution
1	6/25/2019	Tuesday	8am-9am	13984	9	SB	54
2	6/26/2019	Wednesday	8am-9am	13918	9	SB	54
3	7/11/2019	Thursday	8am-9am	13899	9	SB	55
4	7/23/2019	Tuesday	8am-9am	13851	8.9	SB	55
5	6/27/2019	Thursday	8am-9am	13820	8.9	SB	55
6	6/24/2019	Monday	8am-9am	13791	8.9	SB	55
7	6/11/2019	Tuesday	8am-9am	13782	8.9	SB	54
8	7/9/2019	Tuesday	8am-9am	13776	8.9	SB	54
9	7/15/2019	Monday	8am-9am	13738	8.9	SB	55
10	7/16/2019	Tuesday	8am-9am	13689	8.8	SB	54
20	11/5/2019	Tuesday	7am-8am	13540	8.7	SB	57
25	6/3/2019	Monday	8am-9am	13509	8.7	SB	55
30	8/8/2019	Thursday	8am-9am	13467	8.7	SB	55
35	6/17/2019	Monday	8am-9am	13438	8.7	SB	56
40	3/6/2019	Wednesday	7am-8am	13416	8.6	SB	57
45	8/9/2019	Friday	8am-9am	13376	8.6	SB	57
50	9/11/2019	Wednesday	7am-8am	13357	8.6	SB	57
75	8/19/2019	Monday	8am-9am	13237	8.5	SB	56
100	5/2/2019	Thursday	8am-9am	13191	8.5	SB	55
125	5/28/2019	Tuesday	7am-8am	13138	8.5	SB	57
150	8/26/2019	Monday	7am-8am	13092	8.4	SB	58
175	6/5/2019	Wednesday	7am-8am	13033	8.4	SB	58
200	9/18/2019	Wednesday	8am-9am	13002	8.4	SB	55

**Attachment C**  
**Existing Model Validation Study**

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## Existing Model Validation Study

A validation study for the Barton Skyway Ramp Relief (BSRR) project was performed in order verify that the existing model accurately predicts existing traffic noise based on current conditions and to ensure that traffic noise is the main source of noise. Model validation compares field-collected sound level measurements to traffic noise levels calculated in an existing condition model that used field-collected traffic parameters.

The BSRR project is contained within the larger Mopac South project and as such the validation site for the BSRR project was selected as part of the Mopac South project. Four validation sites were selected along the Mopac South project ROW (Figure 1) after consultation with TxDOT district staff and ENV noise subject matter experts. The second validation site for Mopac South, R05 (Figures 1 and 2), was used for model validation on the BSRR project as it is located within the BSRR project boundaries. Field measurements were collected on February 27, 2020 between 9:50 AM and 10:06 AM. The weather was sunny and dry, with calm to light winds. During the measurements, traffic was free-flowing and traveling at a relatively constant speed.

A Sound Pro DL Type II sound level meter was used to measure sound levels in dB(A) Leq. The sound level meter was positioned on a tripod with the microphone facing the roadway and set at a height of five feet. The measurement duration was 15 minutes. The meter was calibrated before measurements were taken and at the end of the day.

Concurrently with the sound level measurement, video cameras were used to record traffic conditions for all existing travel lanes adjacent to the noise meter. Due to line-of-sight issues, separate cameras with synchronized time stamps were used to record northbound and southbound traffic. Traffic speeds were also calculated from the recorded video footage by determining the time it took for cars to travel between two points. Weather conditions, including temperature and wind speed/direction, were also recorded during the measurement period. Field data sheets are included in Appendix 1.

Upon return from the field, traffic video recordings were reviewed to obtain traffic counts by vehicle classification (car, medium truck, and heavy truck). Because the noise modeling software uses a vehicle per hour input, vehicle counts for the 15-minute measurement interval were multiplied by four to convert the values to the hourly condition. Traffic counts and model inputs are included in Appendix 2.

The FHWA traffic noise modeling software (TNM 2.5) was used to calculate existing traffic noise levels at each validation location, based on the field-observed conditions. The validation model run(s) used the existing roadway parameters, observed hourly traffic counts, and observed speeds.

The traffic noise model validation results are shown in Table 1

**Table 1: Traffic Noise Model Validation**

Validation Site	Field Measured Level dB(A) Leq	Modeled Level dB(A) Leq	Difference (+/-)	Validated?
Site 1 (R05)	78.2 dB(A)	75.6	2.6	Yes

Figure 1: Validation Sites Identified for Mopac South

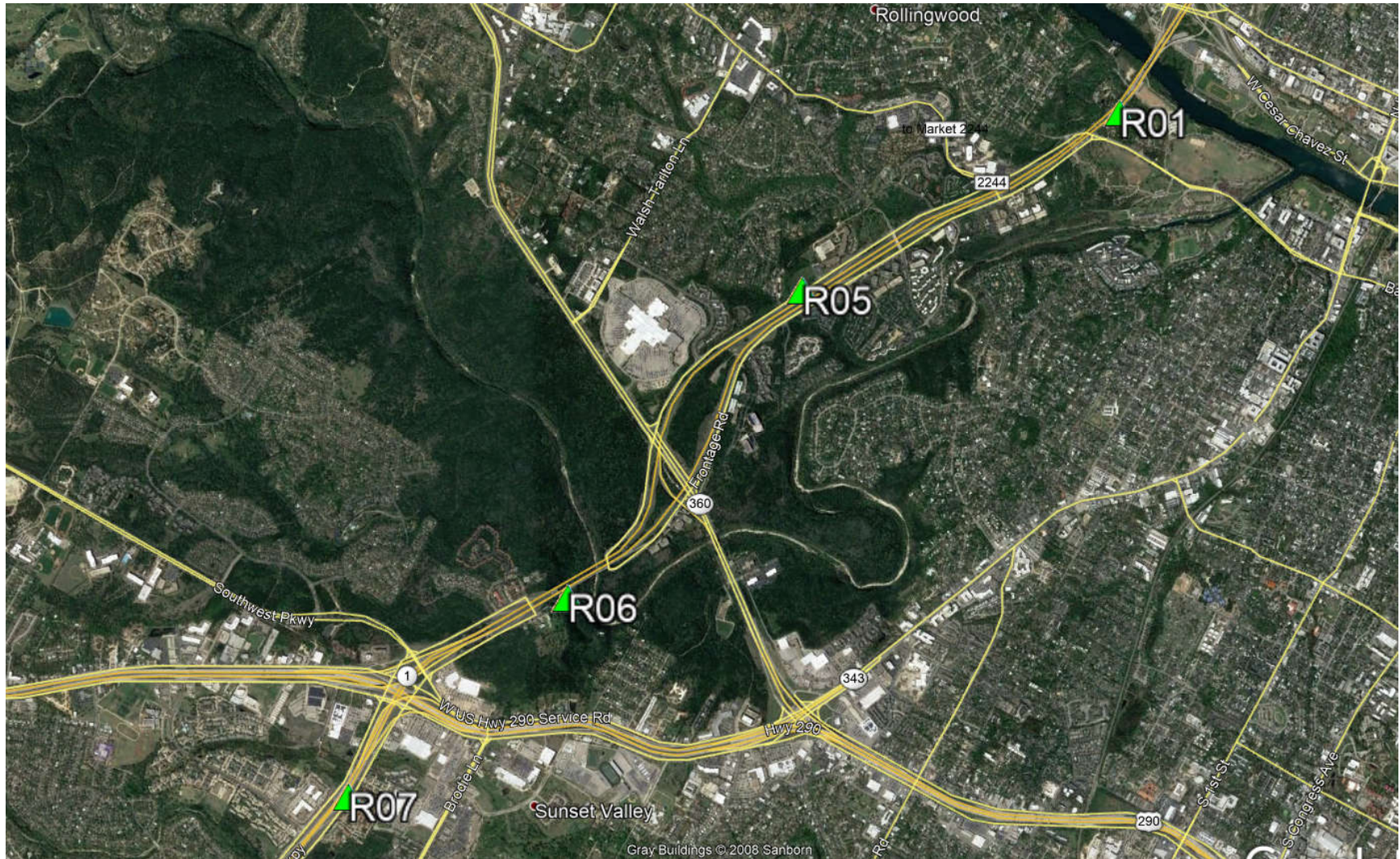
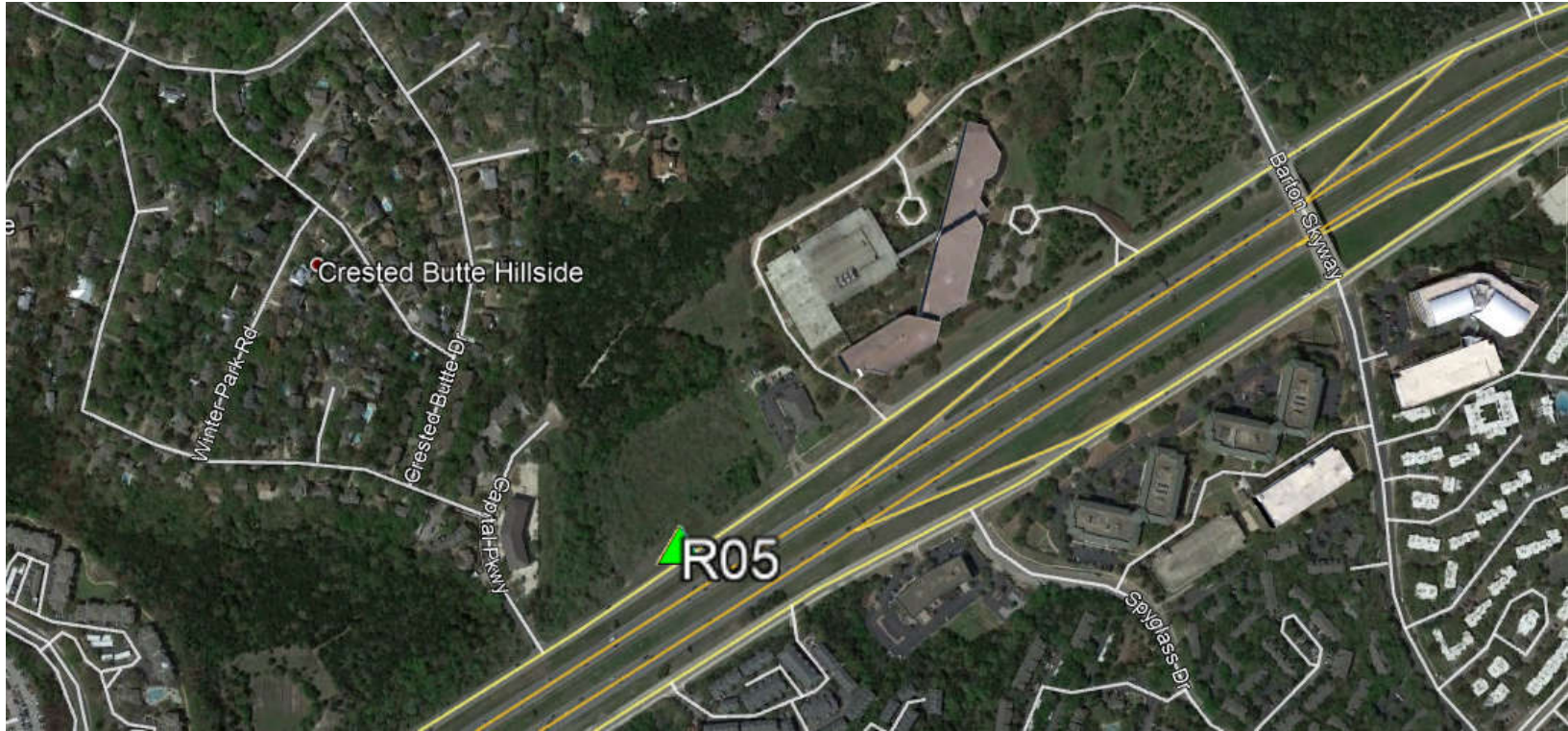


Figure 2: Validation Site for Barton Skyway Ramp Relief Project



# **Appendix 1**

## **Field Data Sheets**

# TRAFFIC SOUND LEVEL DATA FOR VALIDATION OF NOISE MODEL

Project: MoPac South

Date: 02-27-2020

Location # R05 Description: SBFR of MoPac Exp. Way,

Feet from Edge of Pavement:     

X: See GIS point # 5 Y:     

**Table 1: Weather Information**

Weather Data			
Wind (mph):	3 mph	Humidity (%):	46%
Temperature (F):	46°	Cloud Cover (%):	Clear

**Table 2: Noise Meter Information**

SLM Model	Sound Pro DL, Type II
SLM Serial #:	BIF040043

**Table 3: Calibration Information**

Type	Calibration Time	Calibration Level Result
Pre-Measurement	9:50 a.m. (CS)	114.0 dB
Post-Measurement	10:00 a.m.	114.0 dB

**Table 4: Observer Information**

Name of Observer	Tasks
Justin Rains	Noisometer, Driver
Russ Shortes	Camera + Speed
Meg Renault-Varian	Camera + Speed
Ben Lee	Driver, Camera, + Speed



Repetition	File Name	Start Time	Roadway Type (Mainline, Frontage, Ramp)	Roadway Direction	Cars	Medium Trucks	Heavy Trucks	Motor-cycles	Buses	Measured Sound Level dB(A)
			Frontage	SB						
			Ramp	NB						
			Ramp	SB						
Repetition	Notes (erroneous noises, problems, etc.)									
1	<p>No problems during recording.</p> <p>Average Speed NBML = 60 mph  Average Speed SBML = 63 mph  Average Speed NBF R = 59 mph  Average Speed SBFR = 58 mph</p>									
2										



Overview of validation site R05 facing Northeast



Overview of validation site R05 facing Southeast

## **Appendix 2**

### **Traffic Counts and Model Inputs**

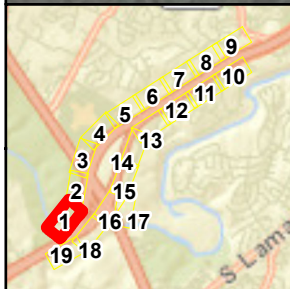
**Table 5: Traffic Counts and Resulting dB(A)**

Repetition	File Name	Start Time	Roadway Type (Mainline, Frontage, Ramp)	Roadway Direction	Cars	Medium Trucks	Heavy Trucks	Motorcycles	Buses	Measured Sound Level dB(A)
1	R05	9:50 a.m.	Mainline	NB	1,461	17	26	2	1	78.2 dBA
			Mainline	SB	1,157	18	35	0	2	
			Frontage	NB	95	0	1	0	0	
			Frontage	SB	51	0	1	0	0	
			Ramp	NB	—	—	—	—	—	
			Ramp	SB	—	—	—	—	—	
2			Mainline	NB						
			Mainline	SB						
			Frontage	NB						

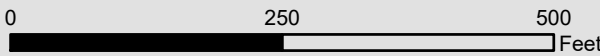
<b>Roadway</b>	<b>Direction</b>	<b>Cars</b>	<b>Medium Trucks</b>	<b>Heavy Trucks</b>	<b>Motorcycles</b>	<b>Buses</b>
Mopac mainlane inside	NB	1461	17	26	1	2
Mopac mainlane center 1	NB	1461	17	26	1	2
Mopac mainlane center 2	NB	1461	17	26	1	2
Mopac mainlane outside	NB	1461	17	26	1	2
Mopac mainlane inside	SB	1157	18	35	2	0
Mopac mainlane center 1	SB	1157	18	35	2	0
Mopac mainlane center 2	SB	1157	18	35	2	0
Mopac mainlane outside	SB	1157	18	35	2	0
Mopac frontage road	NB	380	0	4	0	0
Mopac frontage road	SB	204	0	4	0	0

**Attachment D**  
**Map Figures**

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- Impacted Traffic Noise Receiver
- Non-Impacted Traffic Noise Receiver
- Existing Right-of-Way
- Project Limits

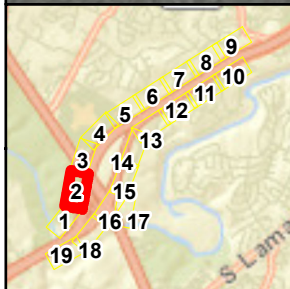


**Traffic Noise Receiver Locations**

Barton Skyway Ramp Relief  
 Barton Skyway to  
 SL 360, Austin  
 AUSTIN, TRAVIS COUNTY,  
 TEXAS  
 CSJ: 3136-01-0193

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community  
 Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community





- Impacted Traffic Noise Receiver
  - Non-Impacted Traffic Noise Receiver
  - Existing Right-of-Way
  - Project Limits
- 0 250 500 Feet

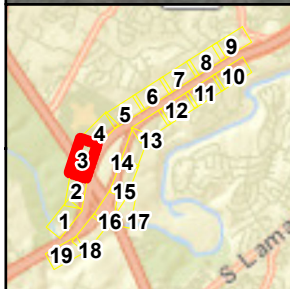


**Traffic Noise Receiver Locations**

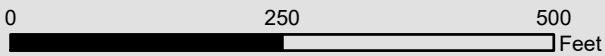
Barton Skyway Ramp Relief  
Barton Skyway to  
SL 360, Austin

AUSTIN, TRAVIS COUNTY,  
TEXAS  
CSJ: 3136-01-0193

Page 2 of 19



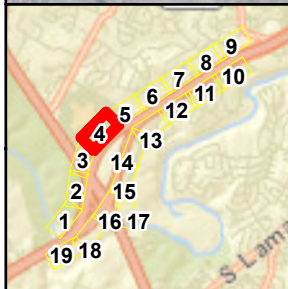
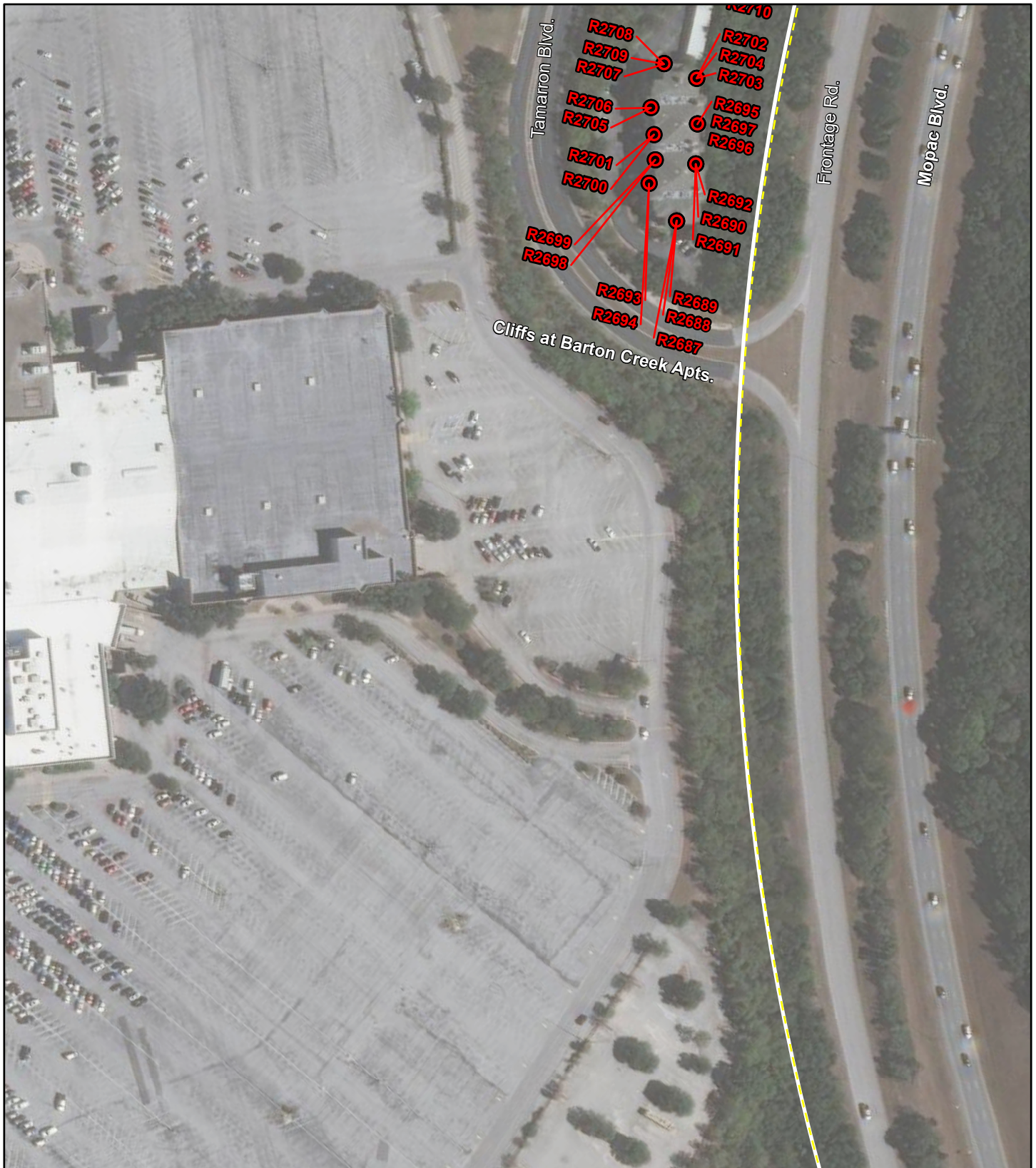
- Impacted Traffic Noise Receiver
- Non-Impacted Traffic Noise Receiver
- Existing Right-of-Way
- Project Limits



**Traffic Noise Receiver Locations**

Barton Skyway Ramp Relief  
 Barton Skyway to  
 SL 360, Austin  
 AUSTIN, TRAVIS COUNTY,  
 TEXAS  
 CSJ: 3136-01-0193

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community  
 Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community



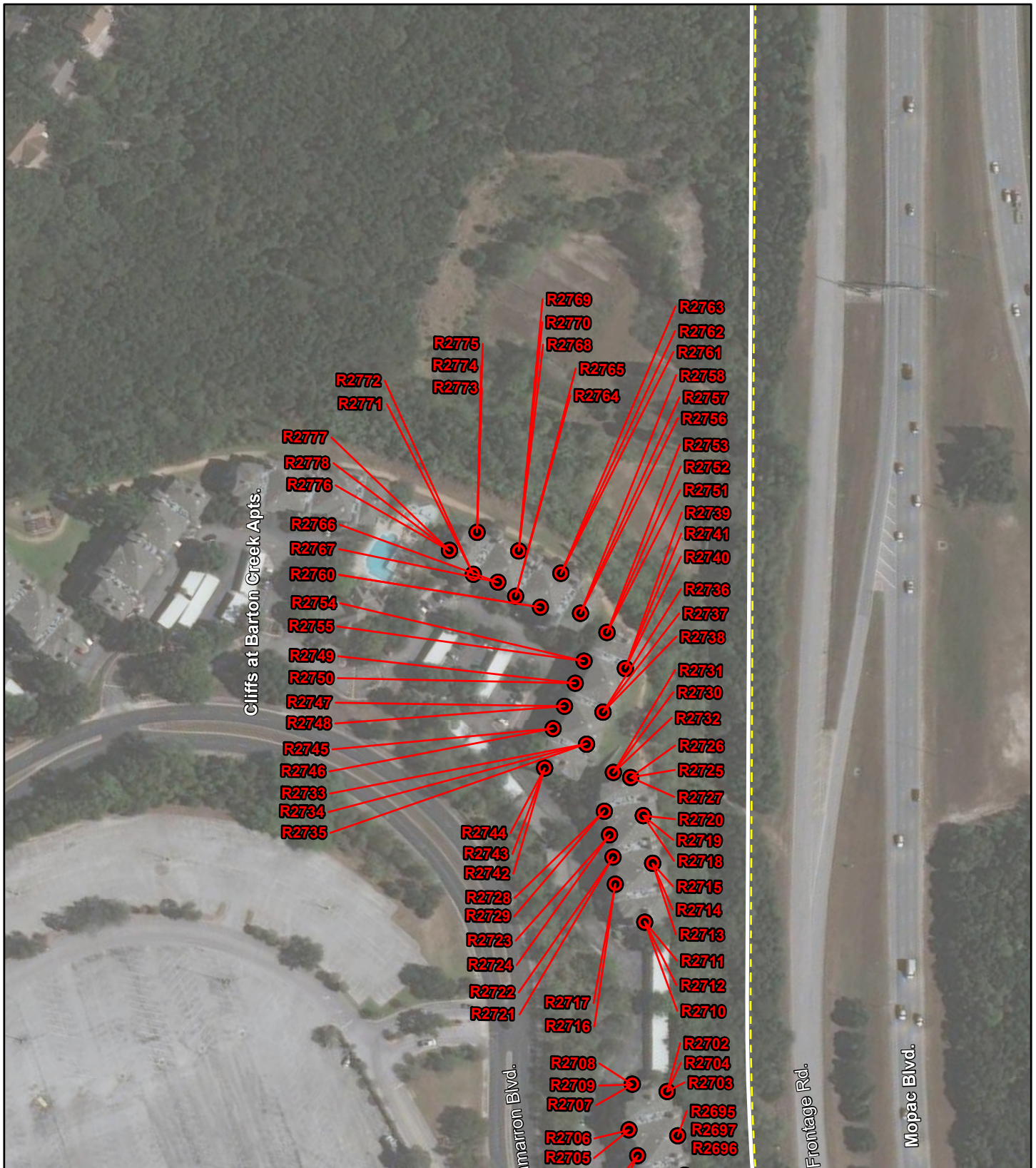
- Impacted Traffic Noise Receiver
  - ⊙ Non-Impacted Traffic Noise Receiver
  - - - Existing Right-of-Way
  - Project Limits
- 0 250 500 Feet



**Traffic Noise Receiver Locations**

Barton Skyway Ramp Relief  
Barton Skyway to  
SL 360, Austin

AUSTIN, TRAVIS COUNTY,  
TEXAS  
CSJ: 3136-01-0193



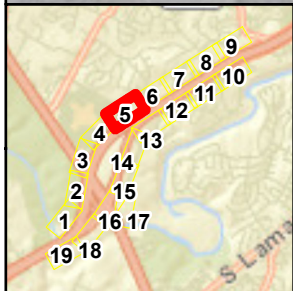
- R2772
- R2771
- R2775
- R2774
- R2773
- R2777
- R2778
- R2776
- R2769
- R2770
- R2768
- R2765
- R2764
- R2763
- R2762
- R2761
- R2758
- R2757
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- R2707
- R2706
- R2705
- R2702
- R2704
- R2703
- R2695
- R2697
- R2696

Cliffs at Barton Creek Apts.

Imarron Blvd.

Frontage Rd.

Mopac Blvd.

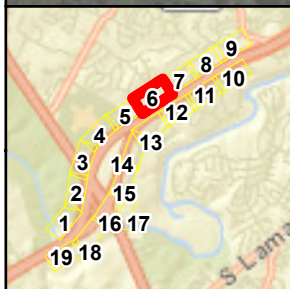
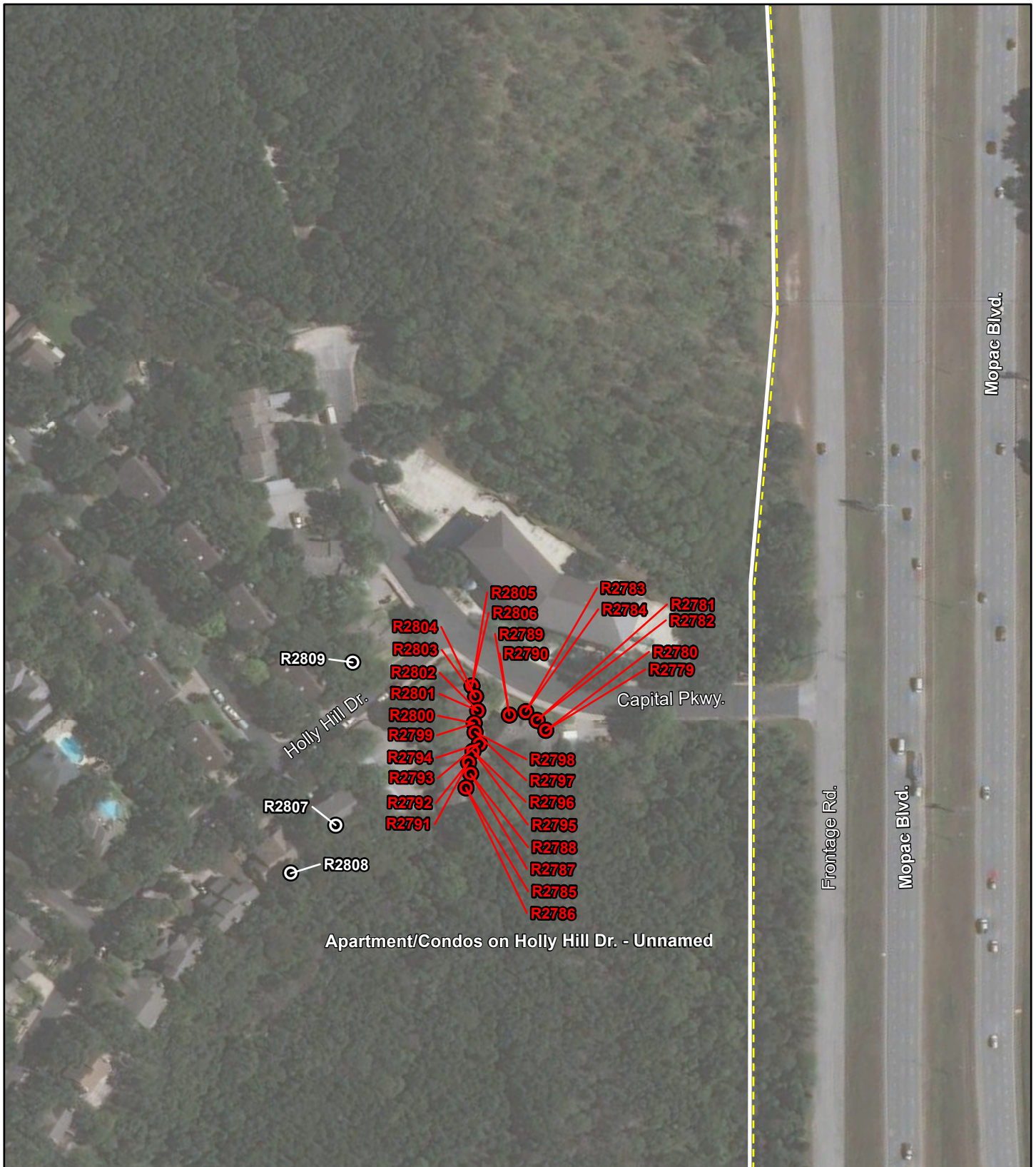


- Impacted Traffic Noise Receiver
  - Non-Impacted Traffic Noise Receiver
  - Existing Right-of-Way
  - Project Limits
- 0 250 500 Feet



**Traffic Noise Receiver Locations**  
 Barton Skyway Ramp Relief  
 Barton Skyway to  
 SL 360, Austin  
 AUSTIN, TRAVIS COUNTY,  
 TEXAS  
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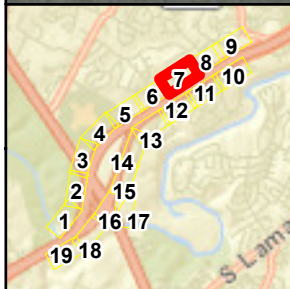
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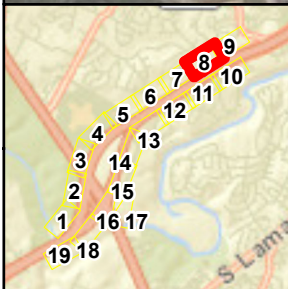


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- Impacted Traffic Noise Receiver
  - Non-Impacted Traffic Noise Receiver
  - Existing Right-of-Way
  - Project Limits
- 0                      250                      500  
 Feet

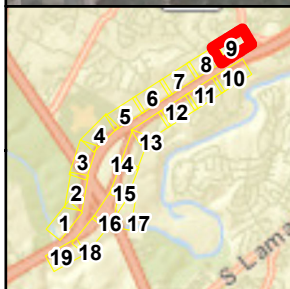


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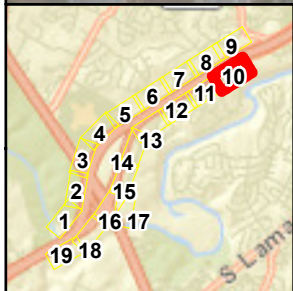
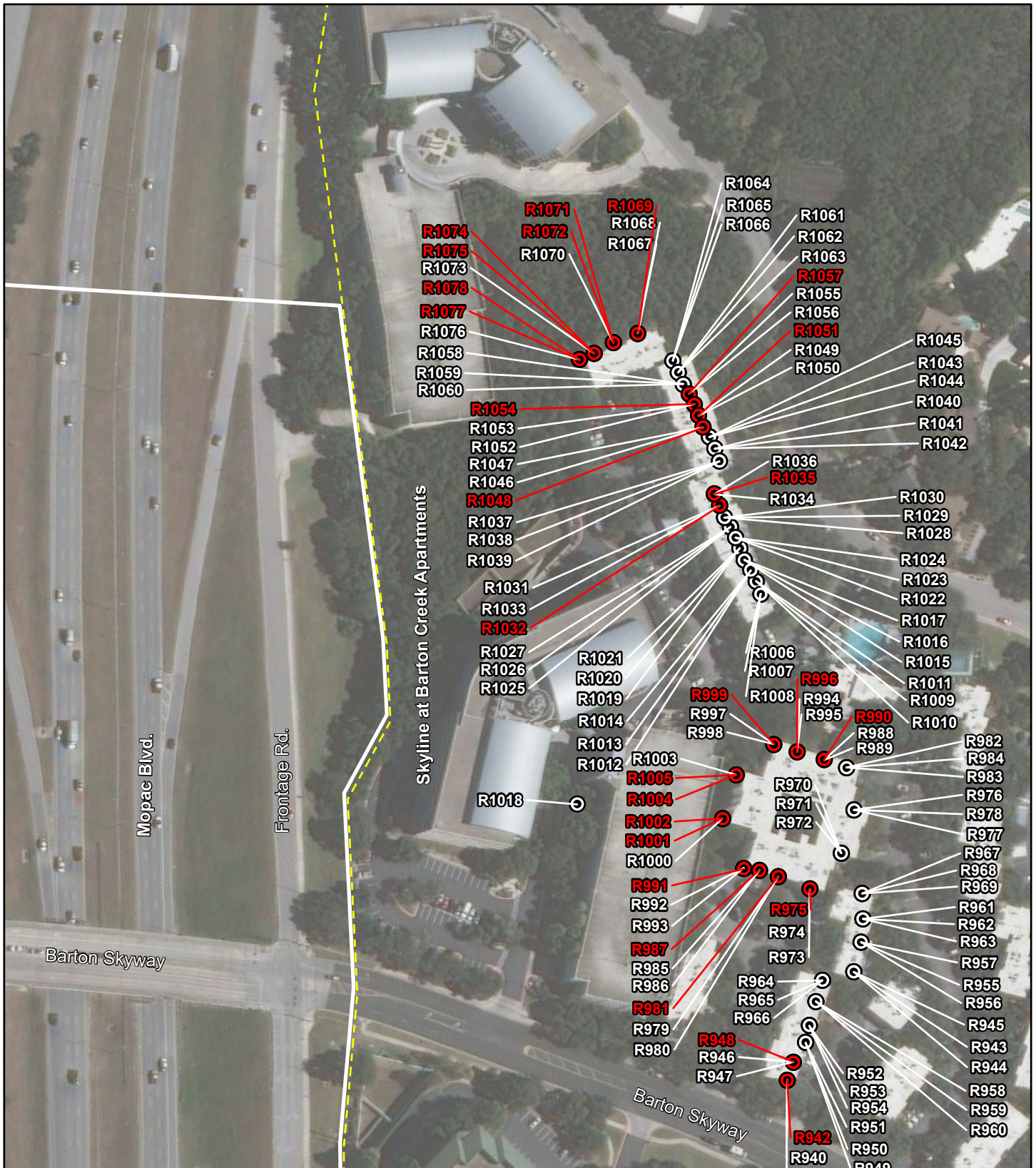
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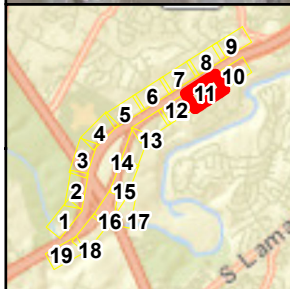
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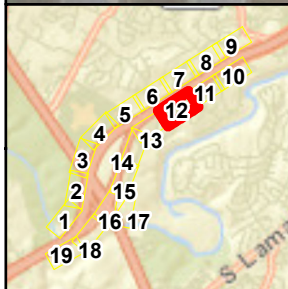


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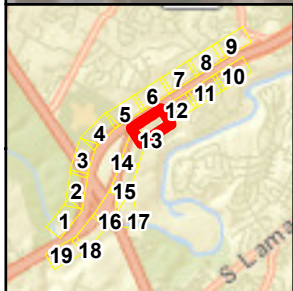
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<p>0                      250                      500</p> <p>Feet</p>	

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- Impacted Traffic Noise Receiver
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- Project Limits



0                      250                      500

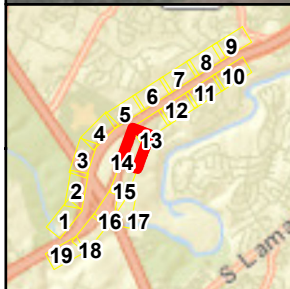
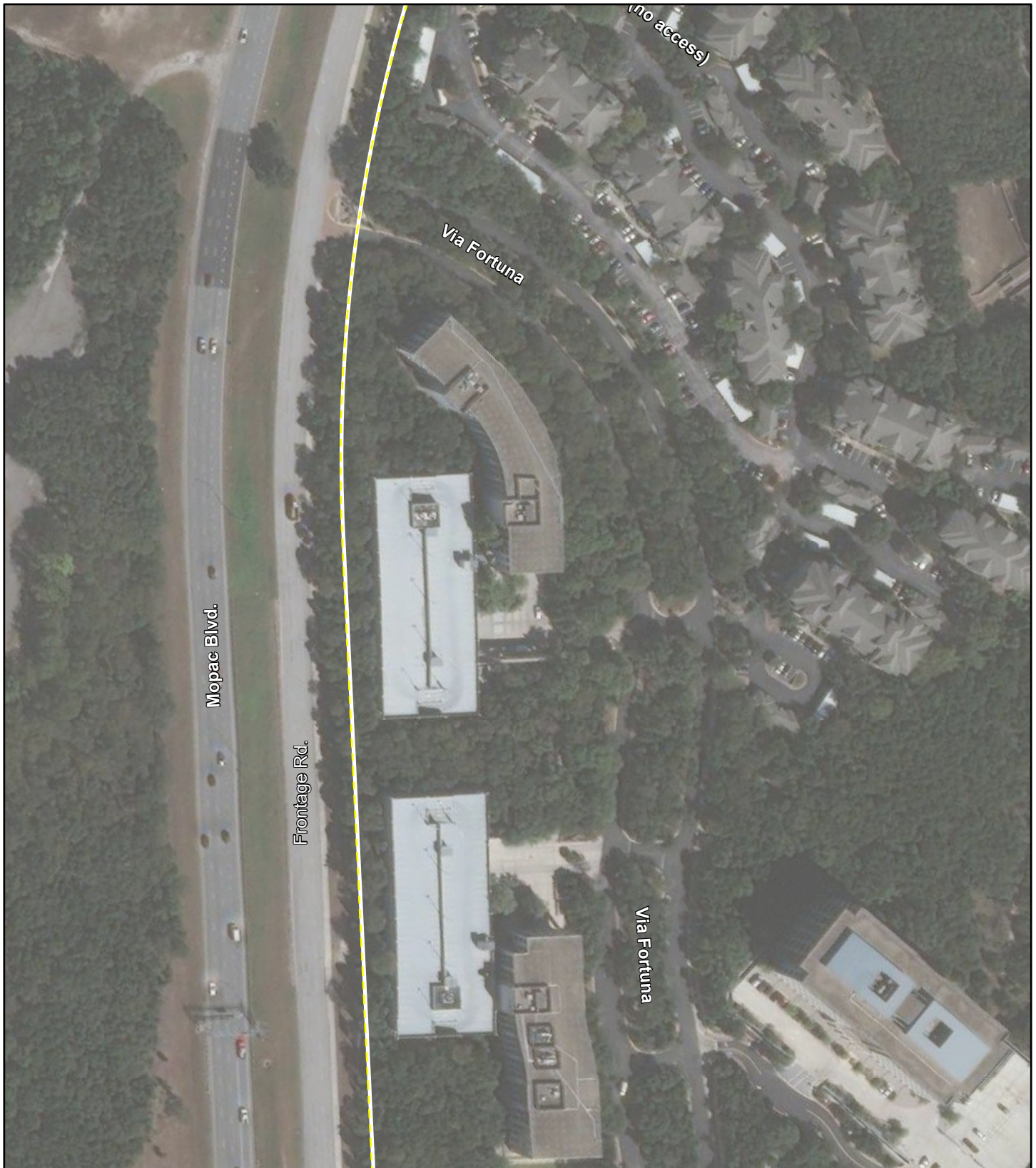
Feet

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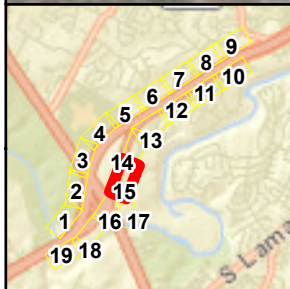


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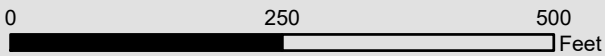


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Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community  
 Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

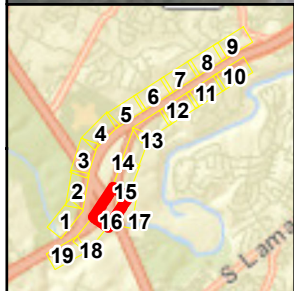


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 Feet

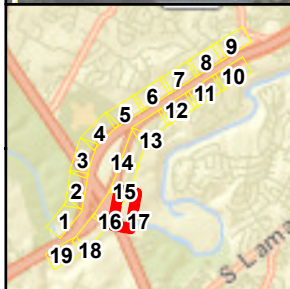


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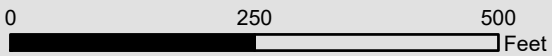
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- Impacted Traffic Noise Receiver
- Non-Impacted Traffic Noise Receiver
- Existing Right-of-Way
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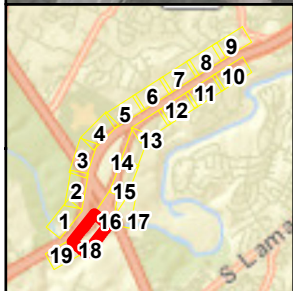
**Traffic Noise Receiver Locations**





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-  Impacted Traffic Noise Receiver
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-  Project Limits

0 250 500 Feet

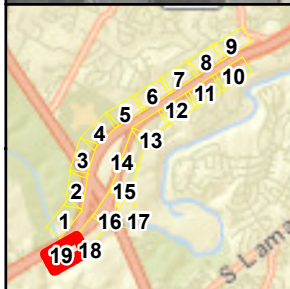


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