Environmental Noise Assessment Report

645 Horning Street
San Jose, CA

Extant Project No. 160913.01

February 27, 2017

Prepared for:

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Executive Summary

The project under consideration is proposing the development of a gas station, self-storage and quick service restaurant in San Jose, CA. The project site is located on the northwest corner of the Horning Street and Oakland Road intersection; with a site address of 645 Horning Street in the City of San Jose, California. The project site bounded by light industrial uses to the west, with transportation right-of-way bounding the project on the northern, eastern and southern property lines. The location of the project site is shown in Figure 1. The proposed site plan and configuration of the proposed project is presented in Figure 2.

The project proposes to construct a new self-storage facility, a quick service restaurant and a gas station with convenience store, and automated car wash. The hours of operation for the self-storage were assumed to be 6:00 AM to 12:00 AM, the quick service restaurant hours are assumed to be 6:00 AM to 12:00 AM and the hours of operation for the gas station/car wash were assumed to be 5:30 AM to 12:00 AM.

Extant Acoustical Consulting LLC (Extant) was retained by the project applicant to perform a noise analysis for the proposed project. In this report, Extant reviews applicable noise standards and criteria, presents the noise monitoring program, evaluates the existing noise environment, and describes modeling assumptions and methodologies used to predict noise emissions due to the proposed project. Findings of the study were evaluated and analyzed against applicable City of San Jose noise standards.

The existing noise levels and observations from the noise monitoring program were used as the basis for modeling of the existing noise environment and evaluation of the potential for project noise levels to effect the existing noise environment. Modeled existing ambient traffic noise level exposures at noise-sensitive receivers in the project area were predicted to range from approximately 63 to 74 dBA DNL.

Noise levels from the operation of the proposed project are anticipated to range approximately 53 to 55 dBA DNL at the prediction receivers representing the noise-sensitive residential receptors. Based on existing noise levels experienced in the vicinity of the project site, project-generated average day-night noise levels are predicted to be at or below ambient noise levels in the majority of the project study area. Moreover, project-generated noise levels are not anticipated to cause a significant increase in the existing noise environment in the project study area.

Based on the assumptions and analysis presented in this report, we conclude the following:

- The predicted average day-night noise levels (DNL) generated from operation of the proposed project are predicted to comply with the City of San Jose exterior noise level standards at noise sensitive receptors in the project vicinity.
- Due to the elevated ambient noise environment in the general vicinity of the project, average day-night noise levels associated with project operations are predicted to be below ambient noise levels currently experienced in the majority project study area.
- Development of the proposed project is anticipated to comply with the City of San Jose significant increase criteria as outlined in General Plan Policy EC-1.2.
- Activities associated with the development and operation of the proposed project are predicted to comply with City of San Jose standards for protection of the existing noise environment.

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1 Introduction

The project under consideration is proposing the development of a gas station, self-storage and quick service restaurant in San Jose, CA. Extant Acoustical Consulting LLC (Extant) was retained by the project applicant to perform a noise analysis for the proposed project. This report reviews applicable noise standards and criteria, evaluates the existing noise environment, and describes modeling assumptions and methodologies used to predict noise emissions from project operations. Furthermore, the report assesses the potential for project-generated noise levels to result in noise impacts on nearby noise-sensitive receptors and land uses. Appendix A provides a description of the various noise metrics and terminology used in this report.

2 Project Description

The project site is located on the northwest corner of the Horning Street and Oakland Road intersection; with a site address of 645 Horning Street San Jose, California. The location of the project site is shown in Figure 1. The proposed site plan and configuration of the proposed project is presented in Figure 2.

The proposed project would redevelop the parcel to include a self-storage, a quick service restaurant and a gas station with a convenience store and car wash. The existing 3.26-acre parcel is currently occupied by approximately 50,000 square feet (sq. ft.) of various light-industrial and commercial uses which would be demolished as part of the project. Access to the proposed project and all incorporated uses, would remain via Horning Street. Parking for the project would consist of 56 spaces located throughout the site, adjacent to each associated use.

The self-storage portion of the project, as currently proposed, would include three separate buildings, with approximately 98,000 square feet of storage space and 1,300 square feet of office space. The self-storage portion of the project would be located across the northern portion of the project site, adjacent to the U.S. 101 ROW. Building "A" is a single-story, 11,871 square foot building, containing the self-storage office and approximately 10,500 square feet of mixed storage space. Building "B" is a 4-story, 79,257 square foot indoor self-storage building. Building "C" is a single-story, 3,800 square foot drive-up self-storage building.

The quick service restaurant (QSR) would be located in the southwest portion of the project site. The QSR building would be approximately 2,500 square feet and incorporate a drive-thru service window with a queuing capacity of 8 to 9 automobiles.

The gas station would be constructed on the southeastern portion of the site and include a convenience store and self-service automated car wash. The gas station portion of the project would include a new fueling canopy, with six (6) new fuel dispensing pumps and twelve (12) fueling positions. The gas station would also incorporate a queuing lane and mechanical room for the car wash, as well as an air-water station and vacuum station along the southeastern boundary of the site.

The proposed demolition of the existing structures, the construction of the various on-site uses proposed as part of the project and the proximity of nearby noise-sensitive receptors has prompted the City of San Jose to request an acoustical analysis be prepared to analyze potential noise impacts associated with the proposed project.

3 Environmental Setting

The Project site is generally located in the northern portion of the City of San Jose, within the City's central planning area. Land uses in the general project area include a mix of light-industrial, commercial, and single and multifamily residential. The project site bounded by light industrial/ commercial uses to the west, with transportation right-of-way bounding the project on the northern, eastern and southern property lines.

The existing noise environment in the project area is effected by a number of noise influences, which are characteristic of urbanized areas. The dominant noise source in the project area is generated by vehicular traffic on the local and regional roadway network. Light-industrial and commercial areas in the general project area contribute to the ambient noise level to a lesser extent. The project area experiences occasional aircraft overflights largely associated with the aviation operations of San Jose International Airport; which is located approximately 1.2 miles west.

3.1 Existing Noise Sensitive Land Uses

Noise-sensitive land uses are generally described as those uses where exposure to excessive noise would result in adverse effects, as well as uses where quiet is an essential element of the intended purpose. Residential dwellings are of primary concern due to the potential for increased and prolonged exposure of individuals to excessive interior and exterior noise levels.

There are no noise-sensitive receptors immediately adjacent to the proposed project boundary; however, there are noise-sensitive multifamily residential receptors in the project study area. Noise-sensitive residential receptors nearest the proposed project site are located to the southwest, across Horning Street; and to the east of the project, across Oakland Road.

3.2 Existing Ambient Noise Survey

An ambient noise survey was conducted by Extant from January 16, 2017 through January 18, 2017 to document the ambient noise in the vicinity of the proposed project and at nearby representative noise-sensitive receptors. Long-term unattended ambient noise monitoring was performed at two (2) locations in the study area. Short-term noise level monitoring was performed at three (3) locations in the project vicinity, on January 18th, 2017. Locations of the noise monitoring sites are presented on an aerial photograph of the area on Figure 1. On Figure 1, the long-term noise measurement sites are represented as LT-##; short-term measurement locations are shown as ST-##.

Noise measurements were performed using Larson Davis Laboratories (LDL) Model 831 precision integrating sound level meters (SLMs). Field calibrations were performed on the SLM with an acoustic calibrator before and after the measurements. Equipment meets all pertinent specifications of ANSI S1.4-1983 (R2006) for Type 1 SLMs. All instrumentation components, including microphones, preamplifiers and field calibrators have laboratory certified calibrations traceable to the National Institute of Standards and Technology (NIST). The microphones were located at a minimum height of 5-6 ft. above the ground, an average height for a person standing, and located a sufficient distance away from reflective surfaces in the monitoring area. Noise measurements were performed in accordance with American National Standards Institute (ANSI) and American Standards for Testing and Measurement (ASTM) guidelines.

The noise monitoring equipment was configured to catalog all noise metrics pertinent to identification and evaluation of noise levels (i.e., Leq, Lmax, Ln, etc.) in the study area. Monitoring data was collected for the overall measurement period and each hourly period.

The following sections discuss the overall monitoring results for the long-term and short-term measurements.

3.2.1 Long-Term Monitoring

Long-term noise monitoring data collected during the noise monitoring program serves to establish a baseline for ambient noise levels in the project vicinity. Additionally, the noise levels cataloged illustrate the dinural pattern experienced at the site; and allow for correlation of hourly noise levels collected at the short-term monitoring locations with the 24-hour day-night noise levels. Long-term noise monitoring equipment was deployed from January 16, 2107 through January 18, 2017 at two locations in the study area, to capture the 24-hour period on January 17th, 2017.

During the long-term monitoring, the primary background noise source affecting the monitoring location was vehicular traffic on the local and regional roadway network (Oakland Rd. and US 101). Additional noise sources experienced during the long-term noise monitoring period included aircraft over-flights, emergency vehicle pass-bys and general community noise in the area. Ambient noise level exposure at the monitoring locations were fairly dependent on the relative distance from nearby transportation noise sources.

Noise monitoring data is summarized below Table 1 for the long-term noise monitoring location in; with detailed noise level data provided in tabular and graph form in Appendix B. The average day-night (DNL) noise level measured during the long-term ambient noise monitoring survey ranged from approximately 71 to 74 dBA DNL. Maximum hourly noise levels (Lmax) documented during the long-term monitoring ranged from approximately 75 to 98 dBA Lmax; with average maximum levels ranging from 79 to 91 dBA Lmax. Maximum noise levels at measurement location LT-01 were found to be influenced by vehicles impacting a steel road plate/trench work cover plate near the measurement site. Noise levels at measurement location LT-02 were not found to be influenced by the road plate; and is therefore considered more representative of typical traffic noise exposure at uses adjacent to Oakland Road.

Table 1 – Summary of Long-Term Noise Monitoring

				Average Hourly Noise Levels, dBA							
				Daytime				Nighttime			
Site	Description[1]	Date	DNL	Leq	Lmax	L50	L90	Leq	Lmax	L50	L90
LT-01	Eastern Project Boundary	01/17/2017	74.3	71.6	90.8	66.6	60.3	66.7	88.9	66.6	53.3
LT-02	West end of Pavilion Loop (Modern Ice Community)	01/17/2017	71.4	68.9	87.7	65.7	60.4	63.9	79.5	56.4	51.0

Notes: dBA = A-weighted decibels; DNL = 24-hour day-night noise level; Leq = equivalent average noise level; Lmax = maximum noise level; L50 = sound level exceeded 50% of the hour; L90 = sound level exceeded 90% of the hour, typically represents the background noise level.

1 – Measurement locations are provided in Figure 1 as an overlay on an aerial photograph.

Source: Extant Acoustical Consulting LLC, 2017

3.2.2 Short-Term Noise Monitoring

Short-term attended monitoring was performed by Extant staff at three (3) locations on the project site on January 18, 2017. Detailed observations about the measurement environment, existing noise sources, and other elements with the potential to effect the measurement or the Project were documented throughout the monitoring program. Short-term monitoring locations are depicted on Figure 1.

Monitoring sites ST-01 was located near measurement location LT-01 to provide additional information about traffic noise levels along Oakland Road and to correspond with long-term monitoring at LT-01. Short-term monitoring sites ST-02 and ST-03 were located to represent nearby residential property lines of the Modern Ice townhome development and 552 Horning Street, respectively. Noise experienced at the short-term monitoring locations ST-01 through ST-03 was predominately due to vehicular traffic on the local roadway network.

Overall noise levels measured at the short-term environmental noise monitoring locations ranged from approximately 64 to 74 dBA Leq. Maximum noise levels documented during the monitoring survey ranged from approximately 80 to 93 dBA Lmax. Generally, noise level exposure was directly dependent on the distance of the monitoring location from surrounding traffic noise sources. Monitoring location ST-01 was influenced by vehicles traversing the road/trench plates, resulting in maximum (Lmax) noise levels being elevated when the trench plate was impacted. However, the average noise level (Leq) experienced at ST-01 was not significantly affected due to the trench plate. Table 2 presents the overall monitoring results for each of the short-term monitoring locations, along with some general notes from each site.

Table 2 – Summary of Short-Term Noise Monitoring

Site	Description[1]	Start Time	Average Noise Levels (dBA)					Notes/Sources
			Leq	Lmax	L50	L90	DNL[2]	
ST-01	Eastern Project Boundary - Oakland Rd Traffic	4:05 PM	73.7	92.5	70.5	63.1	76.6	Traffic on Oakland, trench plate noise.
ST-02	Adjacent to 973 Pavilion Loop Property Line.	4:25 PM	71.4	83.1	68.0	61.3	75.6	Traffic on Oakland.
ST-03	Adjacent to 552 Horning Street Property Line.	5:15 PM	63.8	80.2	58.9	54.7	66.7	Traffic on Horning and Oakland, Community Noise.

Notes: dB = A-weighted decibels; Leq = equivalent average noise level; Lmax = maximum noise level; L50 = sound level exceeded 50% of the period; L90 = sound level exceeded 90% of the hour, typically represents the background noise level.
1 – Measurement locations are provided in Figure 1 as an overlay on an aerial photograph.
2 – Average Day-Night Level (DNL) interpolated based on corresponding long-term measurement data.
Source: Extant Acoustical Consulting LLC, 2017

3.2.3 Existing Traffic Noise

Existing traffic noise levels were modeled for roadway segments in the project vicinity based on the Federal Highway Administration (FHWA) Highway Traffic Noise Model (TNM) Version 2.5® prediction methodologies, and traffic data for project area roadways from the traffic impact analysis prepared for the project (Hexagon 2017). The FHWA TNM incorporates state-of-the-art sound emissions and sound propagation algorithms, based on well-established theory and accepted international standards. The acoustical algorithms contained within the FHWA TNM have been validated with respect to carefully conducted noise measurement programs, and show excellent agreement in most cases for sites with and without noise barriers (FHWA 1998).

Noise modeling for the project was performed through the application of established assessment methodologies and algorithms to propagate noise levels into the surrounding community (e.g., traffic noise via FHWA TNM 2.5) within the SoundPLAN noise modeling program. The model incorporated a three-dimensional geometric model of the study area developed from digital terrain information, available GIS information, aerial photography and information provided by the project team. The noise modeling accounted for factors as vehicle volume, speed, vehicle type, roadway configuration, distance to the receiver, and propagation over different types of ground (acoustically soft and hard ground). In order to ensure that modeled existing traffic noise levels correlate with measured traffic noise levels, observations and data collected during short-term noise monitoring was used to calibrate the traffic model. Modeled average traffic noise levels were found to be reasonably consistent with traffic noise measurements conducted at the project site, over-predicting traffic noise levels by approximately 0 to 1.5 dB. As this is within the tolerances of the traffic noise prediction model calibration offsets were not applied to the model.

Noise prediction receivers were placed within the noise model, representing noise-sensitive receptors (i.e., single family residences, multi-family residential, outdoor activity areas, schools, etc.), locations of key interest, and the locations of the noise monitoring sites used during the field survey. Modeled traffic noise exposure levels at nearby noise-sensitive receivers in the immediate project vicinity are shown in Table 3. Equal level noise contours for the modeled existing traffic conditions in the project area are presented graphically in Figure 3. As shown in Table 3, modeled traffic noise level exposures at prediction receivers in the project area range from approximately 61 to 74 dBA DNL; with noise levels at the receivers representing the noise-sensitive residential receptors in the study area ranging from 63 to 74 dBA DNL.

Table 3 – Modeled Existing Traffic Noise Levels

Site	Location	Land Use	Threshold	Noise Level Exposure (DNL, dBA)
P-01	Eastern Project PL	Right-of-Way	-	70
P-02	Northwestern Project PL	Light Industrial	70	62
P-03	Southwest Project PL	Light Industrial	70	61
P-04	995 Oakland Rd.	Light Industrial	70	65
P-05	552 Horning Street	Multifamily Residential	60	63
P-06	973 Pavilion Loop	Multifamily Residential	60	74
P-07	961 Pavilion Loop	Multifamily Residential	60	72
P-08	951 Pavilion Loop	Multifamily Residential	60	71
P-09	End of Pavilion Loop	Multifamily Residential	60	70

Notes: dBA = A-weighted decibels; DNL = Day Night noise level.
Locations of noise monitoring sites and noise prediction receivers with modeled existing traffic noise level contours are shown on Figure 3.
Source: Extant Acoustical Consulting LLC, 2017

4 Regulatory Criteria

Standards and guidelines for addressing noise exposure within the City of San Jose are contained primarily in the City of San Jose General Plan, with additional guidelines found in the City of San Jose Municipal Code.

4.1 City of San Jose General Plan

The General Plan Noise Element establishes objectives, policies, and actions to protect its inhabitants against exposure of noise-sensitive uses to loud noise and to prevent encroachment of noise-sensitive uses on existing noise producing facilities.

The General Plan establishes exterior noise level standards and maximum allowable noise exposure levels at noise-sensitive land uses, which are considered "normally acceptable", and represented below in Table 4 (Section EC-1.1 and Table EC-1 of the City of San Jose General Plan). The noise level guidelines are presented in terms of the 24-hour CNEL or DNL noise level in dBA. The intent of these guidelines is to affect new project development through the discretionary review process to reduce potential noise exposure and excessive noise within the community.

As outlined in policy EC-1.2, the General Plan seeks to minimize noise impacts of new development on existing noise-sensitive receptors by limiting the effect a project may have on the existing ambient noise environment. A project is considered to cause a significant noise impact if the DNL at noise-sensitive receptors would increase by 5 dBA or more, where ambient noise levels would remain "Normally Acceptable" (60 dBA DNL); or if a project would result in an increase of 3 dBA or more, where noise levels would equal or exceed the "Normally Acceptable" level (60 dBA DNL).

Policy EC-1.3 of the General Plan limits noise generation for new non-residential land uses which are adjacent to residential land uses, to 55 dBA DNL at the residential property line.

The effects of operational noise are discussed briefly in General Plan Policy EC-1.6, which prescribes regulation of commercial and industrial operational noise levels through application of the City's Municipal Code. The Municipal Code standards are discussed in the following section.

The General Plan provides guidelines for construction operations within Policy EC-1.7, requiring construction operations within San Jose to use best available noise suppression devices and techniques; and limit construction hours near residential uses per the City's Municipal Code (7 A.M. to 7 P.M., Monday through Friday).

Policy EC-1.8 of the General Plan states that commercial drive-thru uses will only be allowed "when consistency with the City's exterior noise level guidelines and compatibility with adjacent land uses can be demonstrated."

Table 4 – Land Use Compatibility Guidelines in San Jose
(City of San Jose General Plan Noise Element, Table EC-1)

Land Use Category	Exterior Noise Exposure (DNL in Decibels (dBA)): below 55	55–60	60–65	65–70	70–75	75–80	above 80
1. Residential, Hotels and Motels, Hospitals and Residential Care[1]	Normally Acceptable	Normally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Unacceptable	Unacceptable
2. Outdoor Sports and Recreation, Neighborhood Parks and Playgrounds	Normally Acceptable	Normally Acceptable	Normally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Unacceptable
3. Schools, Libraries, Churches, Hospitals, Nursing Homes	Normally Acceptable	Normally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Unacceptable	Unacceptable
4. Office Buildings – Business, Commercial & Professional	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Unacceptable
5. Sports Area, Outdoor Spectator Sports	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Unacceptable
6. Public and Quasi-Public Auditoriums, Concert Halls, Amphitheaters	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Unacceptable	Unacceptable	Unacceptable

[1] Noise mitigation to reduce interior noise levels pursuant to Policy EC-1.1 is required.

Normally Acceptable	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
Conditionally Acceptable	Specified land use may be permitted only after detailed analysis of the noise reduction requirements and needed noise insulation features included in the design.
Unacceptable	New construction or development should generally not be undertaken because mitigation is usually not feasible to comply with noise element policies.

Source: Envision San Jose 2040 General Plan

4.2 The City of San Jose Municipal Code

The City of San Jose Municipal Code addresses and provides a means for protection of the citizens of San Jose through both qualitative and quantitative provisions and prohibitions. The primary purpose of the Code is intended to promote and secure the public health, comfort, safety, welfare and prosperity, and the peace and quiet of the city and its inhabitants. The Code serves as an implementation method for the General Plan and enforcement element for establishing the desired character of the City.

As a means of enforcement, the City of San Jose Code of ordinance contains subjective (qualitative) guidelines, codes and statutes within Chapter 10.16. The City of San Jose provides further guidance and regulation on allowable noise levels within Title 20 of the Code of Ordinances, which are specific to land use.

The City of San Jose Zoning Maps designates the parcel where the project under consideration is proposed as Light Industrial (LI). The adjoining parcels along the western project boundary is also zoned as Light Industrial (LI) and is used for light industrial and commercial purposes. All other parcel boundaries (north, east and west) are adjoining transportation right-of-ways.

The Municipal Code establishes in Section 20.50.300 that for Light Industrial Districts "*The sound pressure level generated by any use or combination of uses on a property shall not exceed the decibel levels indicated in Table 20-135 at any property line, except upon issuance and in compliance with a conditional use permit as provided in Chapter 20.100.*" Table 20-135 establishes a maximum noise level of 55 dB for industrial use adjacent to a property used or zoned for residential purposes (consistent with General Plan Policy EC 1.3); 60 dB for industrial use adjacent to a property used or zoned for commercial or other non-residential purposes; and, 70 dB for industrial use adjacent to a property used or zoned for industrial or use other than commercial or residential purposes.

4.3 Council Policy 6-10

The City of San Jose provides additional guidance for the development and issuance of land uses incorporating a drive-through use. This guidance is provided within Council Policy 6-10, "Criteria for the Review of Drive-Through Uses". Section II of Council Policy 6-10 pertains specifically to noise. The Policy requires that noise levels generated by drive-through speakers are not audible from adjacent residential uses; and limits the use of drive-through speakers where drive-through lanes directly abut residential uses.

5 Methodology

The SoundPLAN® computer noise model was used for computing sound levels from the proposed project throughout the surrounding community. An industry standard, SoundPLAN was developed by Braunstein + Berndt GmbH to provide estimates of sound levels at distances from specific noise sources taking into account the effects of terrain features including relative elevations of noise sources, receivers, and intervening objects (buildings, hills, trees), and ground effects due to areas of hard ground (pavement, water) and soft ground (grass, field, forest). In addition to computing sound levels at specific receiver positions, SoundPLAN can compute noise contours showing areas of equal and similar sound level.

The SoundPLAN model incorporates a geometric model of the study area and reference noise source levels for the project noise sources. SoundPLAN uses a sound propagation model to project noise levels from the project into the surrounding community. The three-dimensional geometric model of the study area was developed from CAD files provided by the project architect, digital terrain information and aerial photography.

Noise prediction receivers were placed within the noise model, representing noise-sensitive receptors (i.e., single family residences, multi-family residential outdoor activity areas, schools, etc.), locations of key interest (presented above in Table 3 and on Figure 3), and the locations of the noise monitoring sites used during the field survey. Noise levels at the specified noise prediction receivers are calculated based on the assessment methodologies and algorithms applicable to respective noise sources. In addition to computing sound levels at specific receiver locations, SoundPLAN can compute noise contours showing areas of equal and similar sound level, which are presented in the attached exhibits.

Construction-related noise effects were assessed with respect to nearby noise-sensitive receptors and their relative exposure (accounting for intervening topography, barriers, distance, etc.), based on application of FHWA Roadway Construction Noise Model (RCNM) and Federal Transit Administration reference noise level data and usage-factors.

Traffic noise levels were calculated using the FHWA Traffic Noise Model (TNM) Version 2.5® prediction algorithms within the SoundPLAN modeling software. Traffic noise levels for the roadway network in the project vicinity were incorporated into the noise model based on Caltrans traffic data for project area roadways and the findings of the field survey.

Potential effects associated with long-term (operation-related) noise sources were assessed based on project documentation, site reconnaissance data and reference noise level for the various noise sources. The sound propagation model within SoundPLAN that was used for this study was the General Noise Prediction Model. This international standard propagation model is used in the U.S. and abroad for industrial noise sources, due to its accurate and reliable propagation equations. The GPM accounts for advanced meteorological propagation effects, variations in terrain and ground type.

6 Project Impact Analysis

As stated in the introduction, the project under consideration proposes to demolish the existing buildings on the project site and construct a new a self-storage, a quick service restaurant and a gas station with a convenience store and car wash. Noise sources associated with each of the proposed uses and the potential impact on the surrounding community are discussed separately within this section.

6.1 Construction Noise

Construction activities are considered short-term, temporary noise source associated with developing projects; the specific level of effort required for this project is currently unknown but would be expected to have a duration of a several months. Construction activities associated with the proposed project are expected to be performed Monday through Friday, between the hours of 7:00 AM and 7:00 PM, consistent with the City of San Jose Municipal Code and Ordinance 26594.

Construction activities would involve demolition, site preparation, grading, utility and infrastructure placement, laying of foundation elements, and construction of structures. Each stage of the construction process utilizes a varied equipment mix, operational characteristics and noise emission characteristics. Construction noise levels in the project vicinity would fluctuate depending on the particular type, number, and duration of usage for the various pieces of equipment.

The specific equipment types, schedules and usage rates required for this project is not known at this time; however, minimal heavy equipment such as excavators, graders, and scrapers are expected to be required as a significant portion of the existing configuration will be able to be utilized for the proposed action. Heavy construction equipment would likely be used sparingly during the demolition phase of construction. The majority of project construction activities would be anticipated to involve the use of small to medium scale equipment such as skid steer tractors, backhoes, compressors, generators, breakers/hammers and power tools. Table 5 provides the reference noise emission levels typically generated by various types of construction equipment and their associated acoustical usage factors. The effect of construction equipment on the noise environment would depend largely on the types of construction activities occurring on any given day, the average operational location of the noise source, relative distances and exposure to noise-sensitive receptors.

The noise control and minimization measures outlined below will further minimize the effects of project-generated construction noise at the adjacent noise-sensitive receptors. Implementation of the following Best Management Practices and construction noise minimization efforts, in combination have been shown to effectively reduce construction noise levels within surrounding communities by 5 to 13 dBA, depending on application.

a) Project construction activities will be performed consisted with the hour of operation requirements of the City of San Jose Municipal Code.

b) Construction equipment and vehicles will be fitted with efficient, well-maintained mufflers that reduce equipment noise emission levels at the project site. Equip internal combustion powered equipment with properly operating noise suppression devices (e.g., mufflers, silencers, wraps) and keep properly maintained and tuned to minimize noise.

c) Portable, stationary and support equipment (such as generators, compressors, and pumps) shall be located as far as reasonably possible from nearby noise-sensitive receptors.

d) Construction equipment will not be idled for extended periods (e.g., 5 minutes or longer) of time in the immediate vicinity of noise-sensitive receptors.

e) Impact tools will be shrouded or shielded with intake and exhaust ports on power equipment muffled or shielded. This may necessitate the use of temporary or portable, application specific noise shields or barriers.

With the implementation of the above noise management and minimization practices, construction activities associated with the proposed project are anticipated to comply with the thresholds established by the City of San Jose.

Table 5 – Construction Equipment Noise Emissions and Usage Factors

Equipment	Maximum Noise Level, Lmax dBA @ 50-feet	Acoustical Usage Factor, Percent
Backhoe	80	40
Compactor (ground)	80	20
Compressor (air)	81	40
Dozer	85	40
Dump Truck	84	40
Excavator	85	40
Flat Bed Truck	84	40
Front End Loader	80	40
Generator	82	50
General Industrial Equipment	85	50
Grader	85	40
Pneumatic Tools	85	50
Pumps	77	50
Roller	85	20
Vibrating Hopper	85	50
Welder/Torch	73	40

Notes:
1- Acoustical use factor is the percentage of time each piece of equipment is operational during a typical day.
Source: Federal Highway Administration 2006; Federal Transit Administration 2006.

6.2 Traffic Noise

Long-term operation of the project would generate an increase in traffic volumes on the local roadway network in the project vicinity. Consequently, noise levels from vehicular traffic sources along affected roadway segments would increase. Traffic noise computations employed the latest version of the FHWA TNM 2.5 prediction algorithms within the SoundPLAN model. Potential off-site noise impacts resulting from the increase in vehicular traffic on the local roadway network, associated with long-term operations of the proposed project, were evaluated under existing and baseline conditions (existing plus approved but not yet constructed projects), with and without implementation of the proposed project.

Traffic volumes and the distribution of those volumes were obtained from the Traffic Impact Analysis prepared for the project (Hexagon 2017). ADT volumes were calculated by summing all traffic movements, for both the AM and PM peak-hours, existing on- or turning on to a particular roadway segment during the peak-hour and multiplying the total peak-hour volume by a "k-factor" of 5. Average vehicle speeds on local area roadways were assumed to be consistent with posted speed limits and remain as such, with or without implementation of the proposed project. Refer to Appendix F for complete modeling inputs and results.

As shown in Table 6, modeled traffic noise levels at noise-sensitive receivers in the project study area currently exceed the City of San Jose 60 dBA DNL transportation noise level thresholds under the existing no project condition. Therefore, the potential for the proposed project to result in a noise level impact at these receivers is evaluated by determining whether project traffic would cause a significant change, of 3 dB or more in the existing ambient noise environment.

6.2.1 Existing Conditions

Modeled traffic noise exposure levels at nearby noise-sensitive receivers in the project vicinity are shown in Table 6 for the existing conditions, with and without implementation of the proposed project. The table also presents relative traffic noise level increases (net change) resulting from implementation of the proposed project, along with an evaluation of relative significance. As discussed, noise level increases due to a project are considered significant if the project would result in a relative increase in the ambient noise environment of more than 5 dBA, for ambient levels below 60 dBA DNL; an increase of more than 3 dBA, for ambient noise levels greater than 60 dB DNL.

As shown in Table 6, increases in traffic noise levels due to development of the proposed project are calculated to range from less than +1 dBA to +1.3 dBA DNL in the project vicinity under existing conditions. The largest increase in roadway noise exposure levels at nearby noise-sensitive receptors in the vicinity of the plan area is projected to occur at the northeastern-most portion of the proposed project; with the proposed project resulting in a change of +1.3 dBA DNL traffic noise exposure at prediction receiver P-01. However, this change is caused by changes in shielding from buildings on the project site and not due to increases in traffic noise.

Development of the proposed project is not predicted to result in a significant relative increase in the ambient noise environment of more than 5 dBA, for ambient levels below 60 dBA DNL; or an increase of more than 3 dBA, for ambient noise levels for ambient noise levels greater than 60 dBA DNL, under the existing condition.

Table 6 – Existing Traffic Volumes

Receiver		Noise Level Exposure (DNL, dBA)				
No.	Description	Threshold	Existing No Project	Existing Plus Project	Net Change[1]	Significant Impact
P-01	Eastern Project PL	-	70	70	<1	No
P-02	Northwestern Project PL	70	62	64	+1.3	No
P-03	Southwest Project PL	70	61	62	+1.1	No
P-04	995 Oakland Rd.	70	65	65	<1	No
P-05	552 Horning Street	60	63	63	<1	No
P-06	973 Pavilion Loop	60	74	74	<1	No
P-07	961 Pavilion Loop	60	72	71	<1	No
P-08	951 Pavilion Loop	60	71	71	<1	No
P-09	End of Pavilion Loop	60	70	70	<1	No

Notes:
dBA = A-weighted decibels; DNL = day-night average noise level, with a penalty applied to noise occurring during nighttime hours (10:00 PM to 7:00 AM).
1- Net change = No-Project noise level, subtracted from Plus-Project noise level.
Source: Hexagon 2017, Extant Acoustical Consulting LLC 2017.

6.2.2 Baseline Conditions

Modeled traffic noise exposure levels at nearby noise-sensitive receivers in the project vicinity are shown in Table 7 for the baseline conditions, with and without implementation of the proposed project. The table also presents relative traffic noise level increases (net change) resulting from implementation of the proposed project along with an evaluation of relative significance.

As shown in Table 7, increases in traffic noise levels due to development of the proposed project are calculated to range from less than +1 dB to +1.3 dB DNL in the project vicinity under existing conditions. The largest increase in roadway noise exposure levels at nearby noise-sensitive receptors in the vicinity of the plan area is projected to occur at the northeastern-most portion of the proposed project; with the proposed project resulting in a change of +1.3 dB DNL traffic noise exposure at prediction receiver P-01. However, this change is caused by changes in shielding from buildings on the project site and not due to increases in traffic noise.

Development of the proposed project is not predicted to result in a significant relative increase in the ambient noise environment of more than 5 dB, for ambient levels below 60 dBA DNL; or an increase of more than 3 dB, for ambient noise levels for ambient noise levels greater than 60 dBA DNL, under the Baseline condition.

Table 7 – Baseline Traffic Volumes

Receiver			Noise Level Exposure (DNL, dBA)			
No.	Description	Threshold	Baseline No Project	Baseline Plus Project	Net Change[1]	Significant Impact
P-01	Eastern Project PL	70	71	71	<1	No
P-02	Northwestern Project PL	-	63	64	+1.3	No
P-03	Southwest Project PL	-	61	62	+1.2	No
P-04	995 Oakland Rd.	70	66	66	<1	No
P-05	552 Horning Street	60	64	64	<1	No
P-06	973 Pavilion Loop	60	75	75	<1	No
P-07	961 Pavilion Loop	60	73	73	<1	No
P-08	951 Pavilion Loop	60	73	73	<1	No
P-09	End of Pavilion Loop	60	72	72	<1	No

Notes:
dBA = A-weighted decibels; DNL = day-night average noise level, with a penalty applied to noise occurring during nighttime hours (10:00 PM to 7:00 AM).
1- Net change = No-Project noise level, subtracted from Plus-Project noise level.
Source: Hexagon 2017, Extant Acoustical Consulting LLC 2017.

6.2.3 Traffic Impact Discussion

Based on the thresholds applicable to the project, changes in the ambient noise environment created by development and implementation of the proposed project would be considered significant if the project would cause a relative increase in the ambient noise environment of more than 5 dB, for ambient levels below 60 dBA DNL; or an increase of more than 3 dB, for ambient noise levels greater than 60 dBA DNL. Traffic noise level impacts associated with development in the proposed project have been analyzed and presented for Existing and Baseline conditions, with and without build-out of the proposed project.

Under the existing conditions (Table 6), traffic noise associated with implementation of the proposed project within the Plan area would result in changes in traffic noise exposures ranging from less than +1 dB to +1.3 dB DNL at representative receptors in the project vicinity. Prediction receivers representing the nearest property boundary of noise-sensitive receptors in the study area were calculated to experience changes in traffic noise level exposures of less than 1 dB DNL.

Baseline conditions, with and without development of the project build-out, are typically considered the most appropriate measurement upon which to determine potential impacts associated with the project; as it represents the earliest date that the proposed project could reasonably be implemented and have the potential to impact the ambient environment. The baseline conditions account for traffic noise levels currently in the existing environment and those of all planned and approved projects anticipated for completion at that time. Baseline traffic noise level contours without implementation of the proposed project are shown in Figure 4 and noise level contours with implementation of the Plan are shown in Figure 5.

Under the baseline conditions build-out scenario (Table 7), traffic noise associated with implementation of the proposed project within the Plan area would result in changes in traffic noise exposures ranging from less than +1 dB to +1.3 dB DNL at representative receptors in the project vicinity. Prediction receivers representing the nearest property boundary of noise-sensitive receptors in the study area were calculated to experience changes in traffic noise level exposures of less than 1 dB DNL.

Therefore, the proposed project would not cause a significant increase in traffic noise levels without the project, under existing, or baseline conditions; and would comply with the City of San Jose ambient noise increase criteria of 3 dB DNL for transportation noise sources.

6.3 Project Operational Noise

6.3.1 Self-Storage

The Self-Storage portion of the proposed project would be located in the northern portion of the project site, incorporating three self-storage buildings with a total square footage of approximately 98,000 in total. The self-storage is currently proposed to be open for operation between the hours of 6:00 AM and 10:00 PM. Noise sources associated with the long-term operation of the self-storage facility are anticipated to be limited to patrons accessing the site, on-site parking and loading/unloading activities. No other significant noise sources were noted or called-out in the project design. The noise generated by the self-storage use would be almost completely shielded by on-site buildings and is not anticipated to result in additional noise exposure at nearby noise-sensitive receptors. Additionally, the noise generated by patrons of the self-storage facility would be similar to other commercial and light-industrial noise sources in the area, but at a lower level.

6.3.2 Quick Service Restaurant

The quick service restaurant portion of the proposed project would be located in the south west portion of the project site. The restaurant would have a square-footage of approximately 2,500 and incorporate a drive-through service window. Noise sources associated with the restaurant would predominately include parking lot activities, vehicles idling in the drive-through, and the drive-through speaker system. Additional noise attributable to restaurant use may include intermittent noise from loading and unloading of delivery trucks, as well as pedestrians accessing the site.

Activities making up a single parking event included vehicle arrival, limited idling, occupants exiting the vehicle, door closures, and conversations among passengers, occupants entering the vehicle, vehicle startup and departure. These parking actions can be described based on the duration of an event, the average noise level and the maximum noise level occurring with a discreet parking action. Noise levels generated by the turnover of vehicles in the store parking lots were estimated according to methodologies established by the Parking Area Noise Recommendations study (Bayer 2007) within the SoundPLAN noise model. Vehicle turnover within the parking lot was established based on the AM/PM peak-hour trip generation rates presented in the traffic study prepared for the project (Hexagon 2017).

The proposed drive-through lane would begin on the northwestern corner of the restaurant building and wrap around the restaurant to the east. Noise sources associated with the drive-through lane would include vehicles circulating along the drive-through lane, idling vehicles, and orders being placed at the drive-through speaker. Vehicles circulating along the drive-through lane and idling in the vehicle stack have previously been documented to produce noise levels of 53 dBA Leq and 58 dBA Lmax at a distance of 20-feet. Measurements performed to document the noise level generated by drive-through speakers have shown noise levels ranging from 46 to 58 dBA at a distance of 20 feet. Measured noise levels correspond well with the reference noise level data provided by drive-through communications system manufacturer, HME.

Based on these measured and reference noise levels and trip generation assumptions provided in the traffic analysis, Quick Service Restaurant noise levels were calculated within the computerized noise prediction model created for the proposed project. Modeled Quick Service Restaurant noise levels were found to range from 33 to 58 dBA DNL at the representative prediction receivers and more specifically, 41 to 45 dBA DNL at the prediction receivers representing nearby noise-sensitive residential property lines.

Council Policy 6-10 specifies that requires that drive-through speakers located adjacent to residential uses are not audible on the residential parcel. As mentioned, the proposed project is not located directly adjacent to or abutting any noise sensitive land uses. However, there are residential land uses in the project study area that may have the potential to be affected by the use of a drive-through speaker.

During the quietest portions of the long-term monitoring period, background noise levels in the project vicinity were noted to be as low as 49 dBA L90, during the proposed operational hours (6:00 AM to 12:00 PM). Maximum noise levels from the drive-through speaker would be 41 dBA Lmax at nearby noise-sensitive receptors. As such, depending on the interpretation of CP 6-10, the project would potentially need to have an automatic volume control installed on the drive-through speaker system. Automated volume control systems for drive-through speaker systems sense the noise levels in the area and adjust the volume of the speaker in accordance.

6.3.3 Gasoline Station, Convenience Store and Car Wash

The gasoline station with convenience store and car wash would be located in the southeast portion of the project site. The gas station is proposed to include six (6) dual sided gasoline pumps, twelve (12) fueling positions. The convenience store would be approximately 3,600 square feet; he associated car wash would be located within a 1,200 square-foot tunnel along the north side of the gas station and convenience store. The hours of operation for the gas station, convenience store and car wash are proposed to be 5:30 to 12:00 AM

The primary noise sources associated with the proposed gas station, convenience store and car wash would be the operation of the automated car wash. Additional noise sources associated with the gas station and convenience store would include an air-water station, vacuum station, and patrons or deliveries accessing the site.

Gas Station and Convenience Store Operations

As patrons access the site, the noise generating activities can be generally lumped into “events”. Activities making up a single-event would include the vehicle arrival, limited idling of the vehicle, occupants exiting the vehicle, door closure, conversations among passengers, occupants entering the vehicle, vehicle startup and departure.

To quantify these events, Extant conducted reference noise level measurements of filling station and parking activities. Sound level data for gasoline fueling events was gathered to determine the sound exposure levels (SEL) associated with a single filling/parking event. The single-event SELs measured at the existing filling station correlate well with empirical data for similar activities and indicate an average single-event SEL of approximately 71 dB SEL at a distance of 50 feet.

Based on ITE Trip Generation vehicle rates supplied by the project traffic consultant, the gasoline station and convenience store operations were assumed to have 16.57 trips per vehicle fueling position during AM peak hour conditions and 19.07 trips per vehicle fueling position per-hour, during PM peak hour operations. Applying these peak hour rates across a 24-hour period overstates the trips occurring during hours other than the peak hour; and as such, would be considered conservative. As before, the SoundPLAN noise prediction model developed for the project was employed.

Also incorporated in to the modeling of gas station and convenience store operations is the noise generated by the air/water station, vacuum station and general parking activities across the project site. The modeled noise levels for the car wash, additional operations, and overall project noise are presented below in Table 8.

Car Wash Noise

Automated car wash equipment and facilities have several potential noise generating sources associated with their general operation; including pumps, compressors, high-pressure applicators and spray nozzles, scrubbers, and dryers. The car wash mechanical equipment (pumps, compressors, etc.) can generate a substantial amount of noise; however, the majority of the mechanical equipment is proposed to be fully enclosed within a mechanical equipment room, adjacent to the car wash tunnel. Potential noise sources not enclosed within the equipment room would include the high-pressure applicators and spray nozzle manifolds; noise from the friction of the wash systems; and noise generated from the dryer system. The dryers however, are the dominate noise source associated with car wash systems; therefore, this analysis will examine car wash-generated noise levels through evaluation of sound levels generated by the dominant noise source, the dryer system.

The proposed full-service car wash will include the use of a Proto-Vest Windshear II Dryer system with incorporated Proto-Vest silencer. The Proto-Vest Windshear II is a stationary, stand-alone drying system, using one (1) 30 horse-power Magnum blower feeding an air plenum arch and three (3) Proto-Duck air delivery bags. The dryer would be located approximately 10-feet inside of the east end of the car wash tunnel. The car wash dryer manufacturer (Proto-Vest) provided reference sound level data for the dryer in the form of sound pressure levels at varying distances. The manufacturer sound level data is provided as a reference in Appendix C. The supplied reference sound level data and operational characteristics for the equipment were used to calculate sound power levels (LwA) for the dryer.

The manufacturer reference source noise levels are based upon continuous operation of the dryers; which is capable of processing cars at conveyor/line speeds up to 70 cars per hour. It should be noted, that the assumption of continuous operation of up to 70 cars per hour, as incorporated into the SoundPLAN noise prediction model, is expected to be conservative based on trip generation rates for similar facilities. The Institute of Transportation Engineers (ITE) Trip Generation, 8th Edition (2008), and the SANDAG Trip Generation Manual, would suggest overall trip rates between 25 and 50 during a peak hour.

Operational and temporal assumptions outlined above along with the calculated sound power levels were used as inputs to the SoundPLAN noise prediction model. Modeled noise levels generated from the operation of the proposed car wash at the representative noise prediction receiver locations are presented in Table 8.

As shown in Table 8, noise levels generated from the proposed car wash dryers are anticipated to range from approximately 47 to 69 dBA DNL, at the prediction receivers representing the adjoining property lines. Therefore, project noise levels are predicted to exceed City of San Jose 55 dBA noise level standards and mitigation will be necessary to achieve compliance with the applicable criteria.

Table 8 – Modeled Operational Noise Levels

Site	Location	Noise Level Exposure (dBA, DNL)				
		Self-Storage	Quick Service Restaurant	Gas & Convenience[1]	Car Wash	Overall Project
Residential Property Line Receivers						
P-01	Eastern Project PL	43	46	64	54	65
P-02	Northwestern Project PL	41	33	38	59	59
P-03	Southwest Project PL	49	58	53	53	61
P-04	995 Oakland Rd.	45	48	56	59	61
Residential Property Line Receivers						
P-05	552 Horning Street	37	45	50	45	53
P-06	973 Pavilion Loop	41	43	53	41	54
P-07	961 Pavilion Loop	41	43	54	51	55
P-08	951 Pavilion Loop	40	42	52	48	54
P-09	End of Pavilion Loop	40	41	50	49	53

Notes: dBA = A-weighted decibels; DNL = Day Night noise level.
1- Incorporates operations associated with the gas station and convenience store portion of the project: patrons, fueling activities, on-site traffic movement, vacuums, air/water stations, and additional parking.
Source: Extant Acoustical Consulting LLC, 2017

Overall project noise levels are anticipated to range from approximately 59 to 65 dBA DNL at property line receptors in the project study area. Overall project levels at prediction receivers representing noise-sensitive residential receptors in the vicinity were found to range from 53 to 55 dBA DNL. Therefore, the proposed project is anticipated to comply with the City of San Jose 55 dBA DNL noise level noise standard for residential uses.

6.4 Effect on Existing Environment

As outlined, the City of San Jose General Plan establishes policy to limit the effect of new projects on the existing ambient noise environment. Existing traffic noise exposure levels, as previously presented, serve as the basis for evaluating the potential for the proposed project to result in increased noise levels. Incorporating existing traffic volumes on the local and regional roadway network into the noise simulation model for the overall project operations and comparing the resulting noise levels to those of the existing environment, the project-related effect on the existing noise environment was determined. Modeled noise levels for the baseline conditions, the overall project, and combined baseline plus project noise levels are presented in Table 9.

Baseline ambient noise levels in the project area are illustrated on Figure 4. The overall noise levels generated by the operation of the proposed project are shown on Figure 6. Modeled ambient noise levels, for the baseline traffic condition, following implementation of the proposed project are shown on Figure 7.

As shown Table 9, the project-related effects on the baseline ambient noise environment were calculated to result in a change of less than 1 dB to approximately 2 dB, from baseline ambient conditions. The project related effects on the baseline ambient noise environment at noise-sensitive residential receptors in the study area were calculated to result in a change of less than 1 dB from the baseline no-project condition. Based on this analysis, project-generated noise levels are not predicted to result in an increase of 3 dB or more in the existing noise environment, as set forth in Policy EC-1.2 of the City of San Jose General Plan. Therefore, the proposed project is predicted to comply with the City of San Jose General Plan existing ambient effect noise standards.

Table 9 – Modeled Project Noise Level Effect

		Modeled Noise Level Exposure (DNL, dBA)				
Site	Location	Baseline Traffic[1]	Overall Project[2]	Baseline Plus Project[3]	Effect on Ambient[4,5]	Impact
Commercial/Industrial Property Line Receivers						
P-01	Eastern Project PL	71	65	72	1	No
P-02	Northwestern Project PL	63	59	64	2	No
P-03	Southwest Project PL	61	61	63	2	No
P-04	995 Oakland Rd.	66	61	67	1	No
Residential Property Line Receivers						
P-05	552 Horning Street	64	53	64	<1	No
P-06	973 Pavilion Loop	75	54	75	<1	No
P-07	961 Pavilion Loop	73	55	73	<1	No
P-08	951 Pavilion Loop	73	54	73	<1	No
P-09	End of Pavilion Loop	72	53	72	<1	No

Notes: dBA = A-weighted decibels; DNL = Day Night noise level.
1. Baseline traffic noise level contours are shown on Figure 4.
2. Overall project noise level contours are shown on Figure 6.
3. Baseline traffic noise level Plus project operational noise levels are shown on Figure 7.
Source: Extant Acoustical Consulting LLC, 2017

7 Conclusion

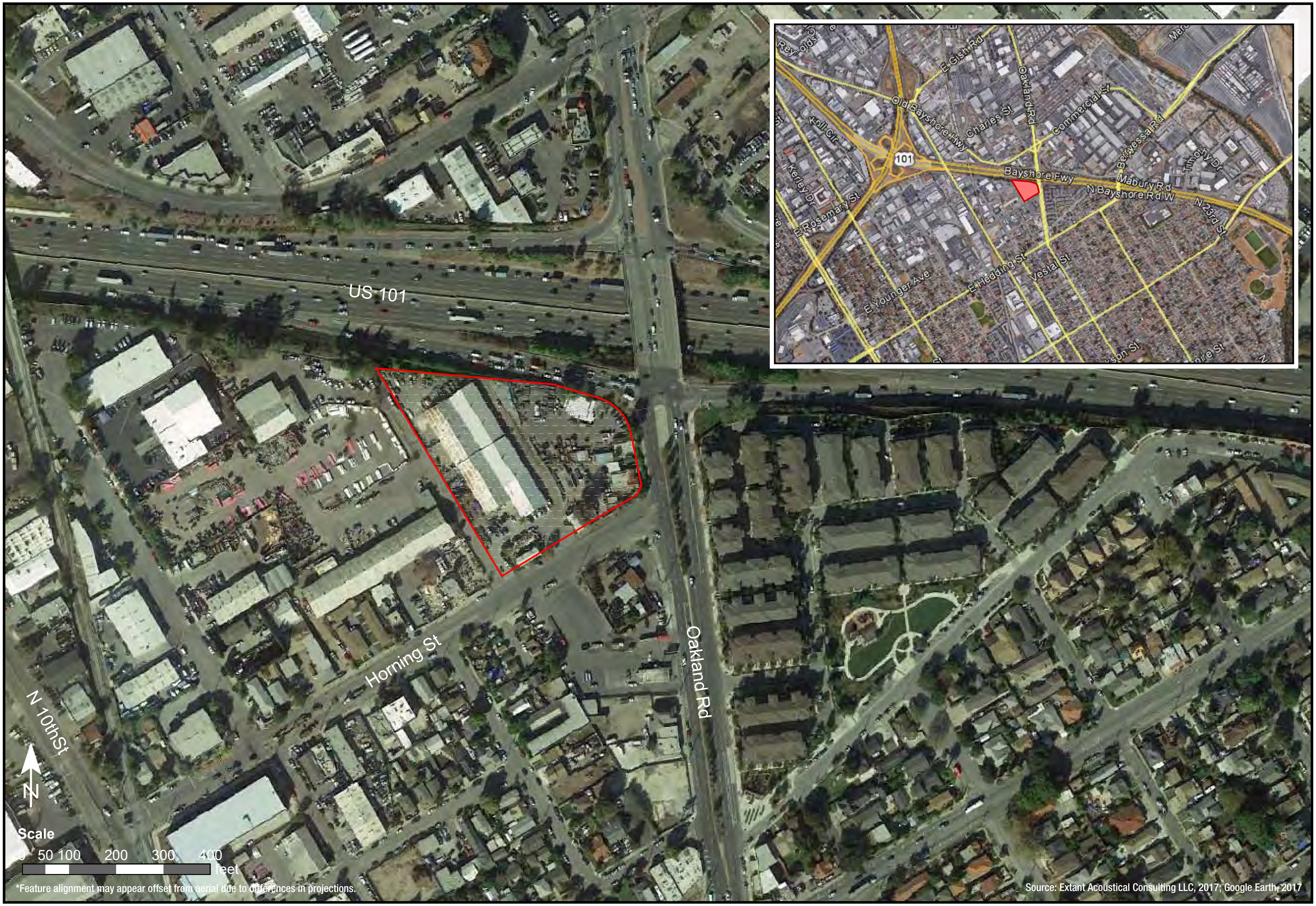
Extant Acoustical Consulting (Extant) has completed a noise assessment for the proposed project; located at 645 Horning Street in San Jose, California. The project is proposed to be located at the site of an existing light industrial use, at the intersection of Oakland Road and Horning Street; in the central planning area of San Jose. The project site is bounded by an adjoining light industrial site to the west and transportation right-of-ways on the north, east and southern project boundaries. The nearest noise-sensitive uses in the project vicinity are located to the south across Horning Street and to the east across Oakland Road.

The project proposes to construct a new self-storage facility, a quick service restaurant and a gas station with convenience store, and automated car wash. The analysis summarized the existing noise environment, presented the noise levels that are predicted to be generated by the proposed project site, and compared the resultant noise levels with applicable City of San Jose noise standards.

Project noise levels are anticipated to range approximately 53 to 55 dBA DNL, at the prediction receivers representing the surrounding noise-sensitive land uses. Based on the analysis presented, the predicted average day-night noise levels (DNL) generated from the operation of the proposed project are predicted to comply with the City of San Jose 60 dBA DNL exterior noise level standards set forth in Table EC-1 of the City of San Jose General Plan (normally acceptable criteria for residences). Project noise levels are also predicted to comply with the 55 dBA noise level standard for new non-residential uses affecting residential land uses as established in the City of San Jose General Plan Policy EC-1.3 and the City of San Jose Municipal Code.

Based on existing noise levels experienced in the vicinity of the project site, project-generated average day-night noise levels are predicted to be at or below ambient noise levels in the majority of the project study area. Noise levels generated from the proposed project were modeled to result in less than a 1 dBA increase in the existing noise environment at noise-sensitive receivers in the project study area. Project-generated noise levels are not predicted to exceed the existing noise environment protection criteria; causing an increase of 3 dBA or more in the existing noise environment, as set forth in Policy EC-1.2 of the City of San Jose General Plan.

Development and operation of the proposed Convenience Store, Gas Station, Car Wash and Retail Location at 645 Horning Street is anticipated to comply with the applicable City of San Jose noise standards.



Signs and Symbols

Project Area

Figure 1

Project Location

Jim Rubnitz
645 Horning Street
San Jose, CA

EXTANT ACOUSTICAL CONSULTING LLC

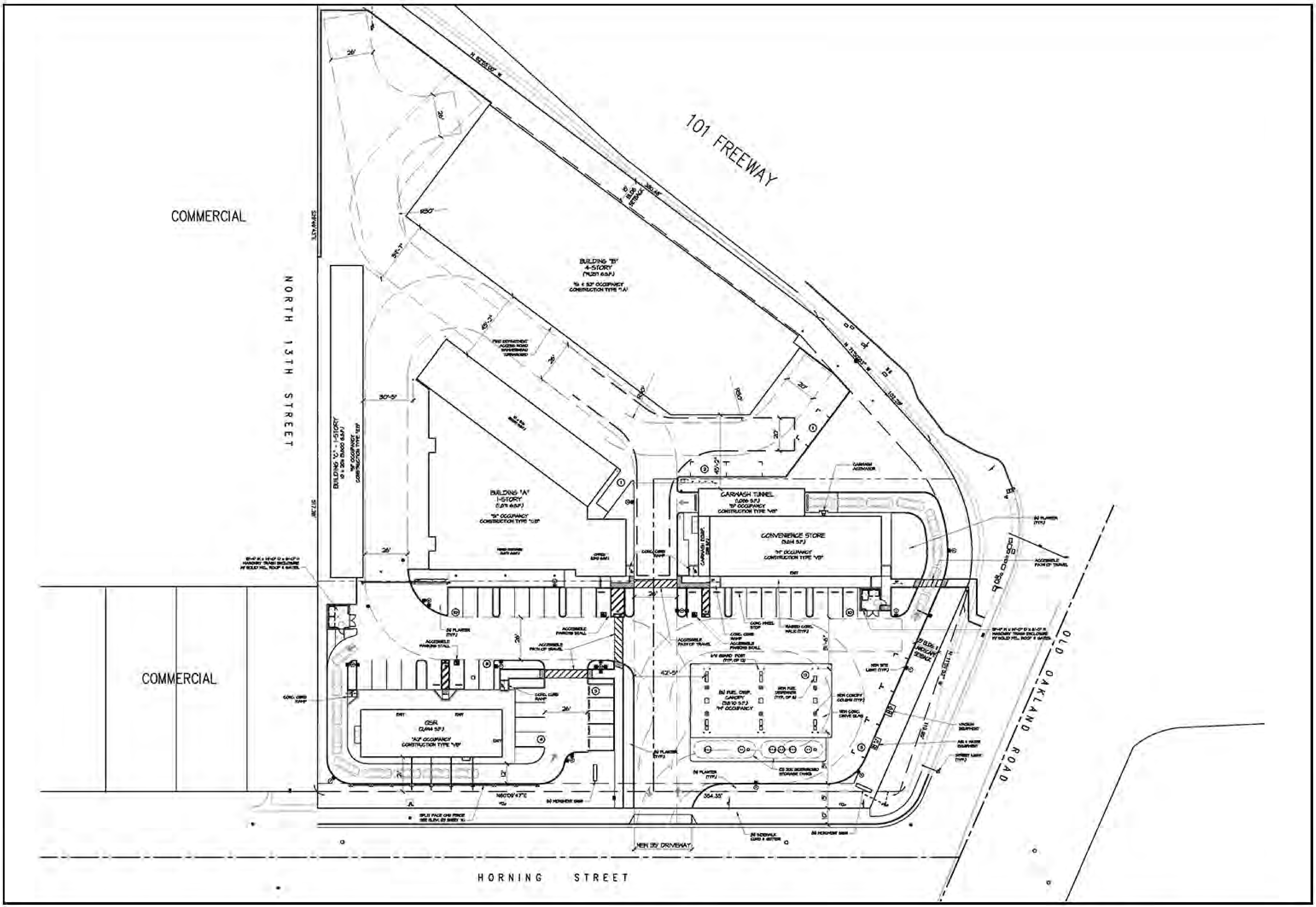
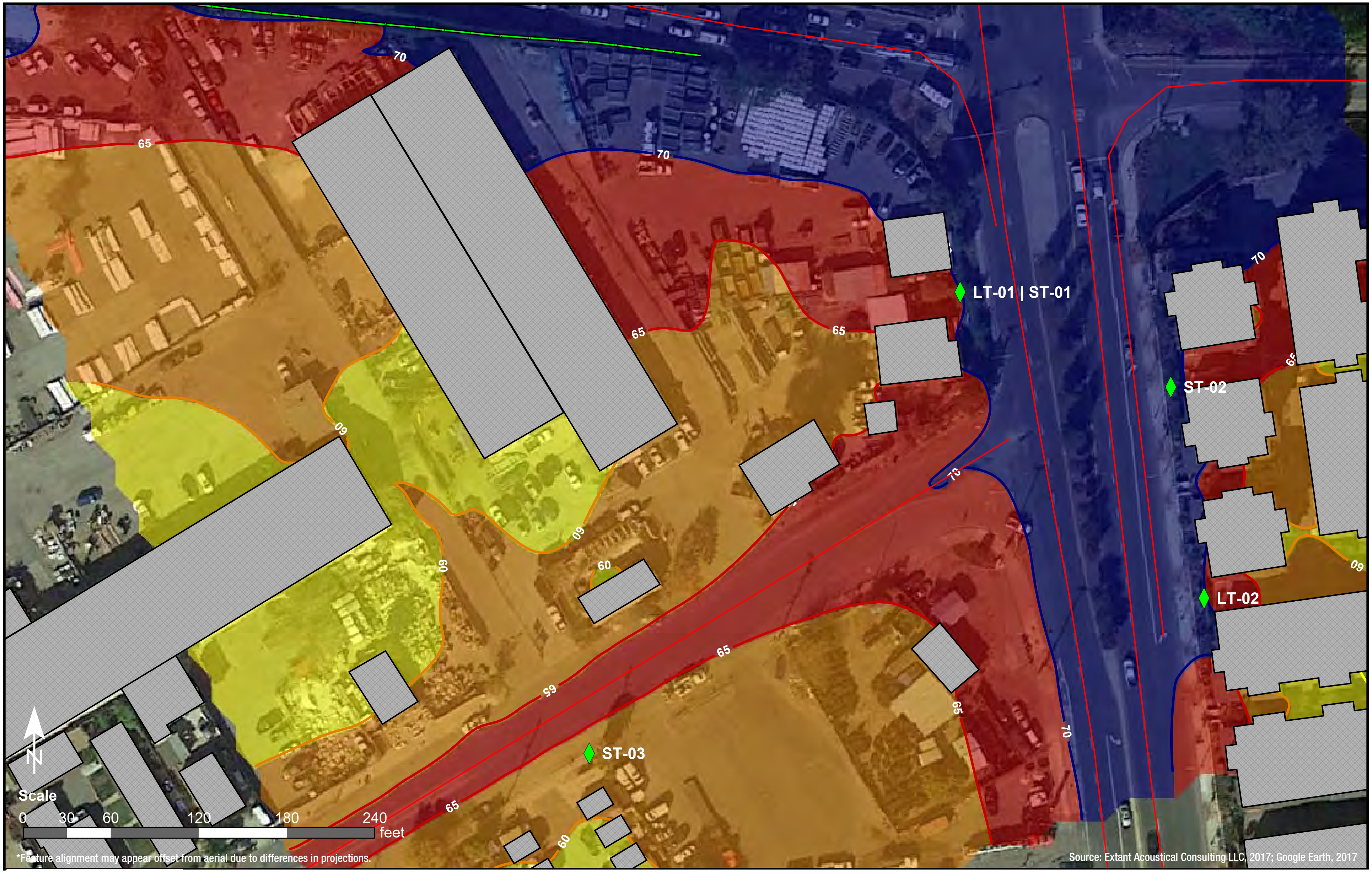


Figure 2

Proposed Site Plan

Jim Rubnitz
645 Horning Street
San Jose, CA
Extant Acoustical Consulting LLC



Signs and Symbols

- Project Area
- Receiver
- Building
- Road Emission

Noise Level
Ldn, dB(A)

- 45 - 50
- 50 - 55
- 55 - 60
- 60 - 65
- 65 - 70
- >= 70

Figure 3

Existing Traffic Noise Levels

Day/Night Noise Level Contours, dBA Ldn
Measurement Locations

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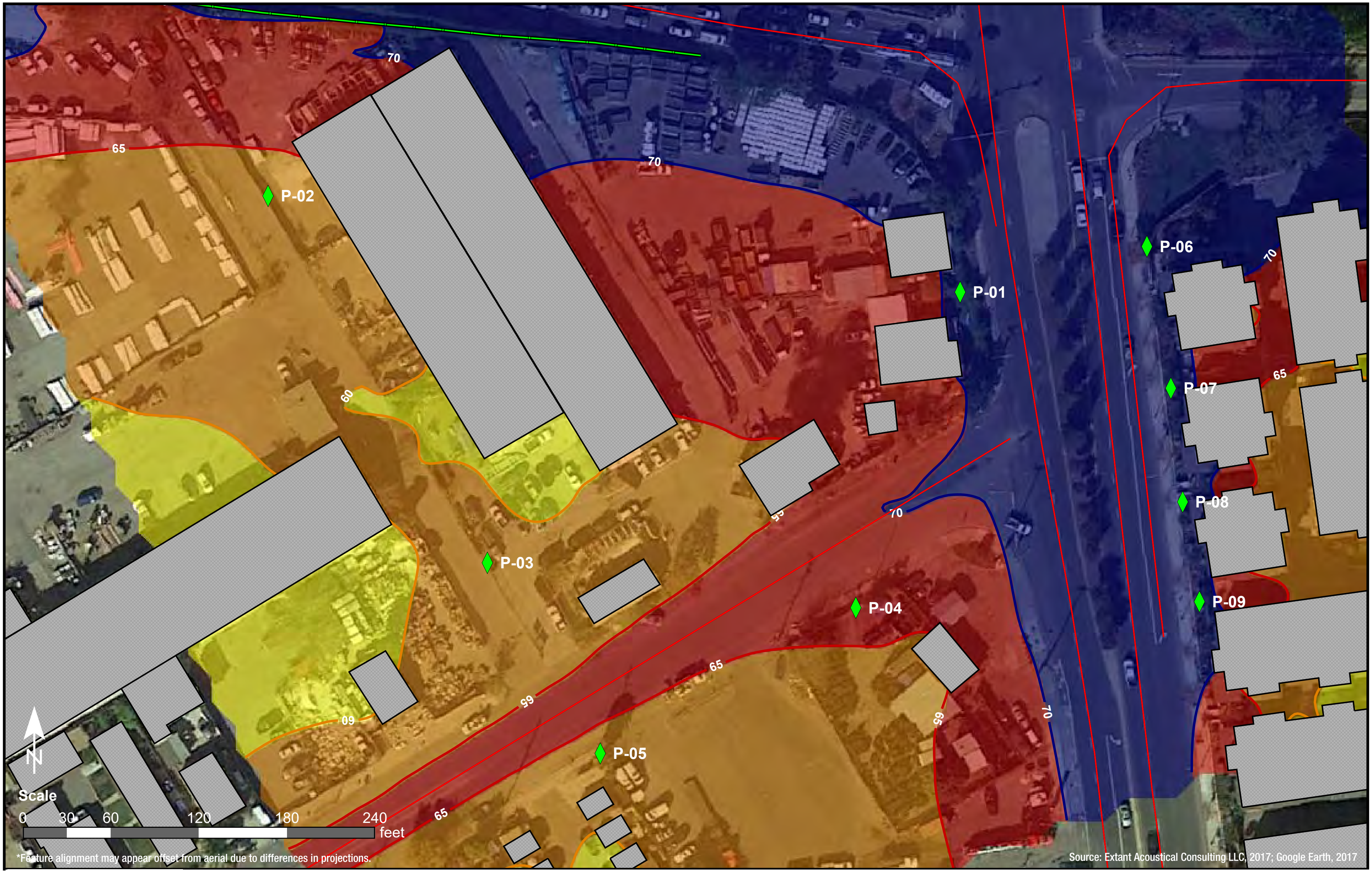
San Jose, CA

EXTANT ACOUSTICAL CONSULTING LLC

Published: 02/27/2017
Engineer: MJC



Signs and Symbols

- Project Area
- Receiver
- Building
- Road Emission

Noise Level
Ldn, dB(A)

- 45 - 50
- 50 - 55
- 55 - 60
- 60 - 65
- 65 - 70
- >= 70

Figure 4

Baseline Traffic Noise Levels

Day/Night Noise Level Contours, dBA Ldn
Prediction Recievers

Jim Rubnitz
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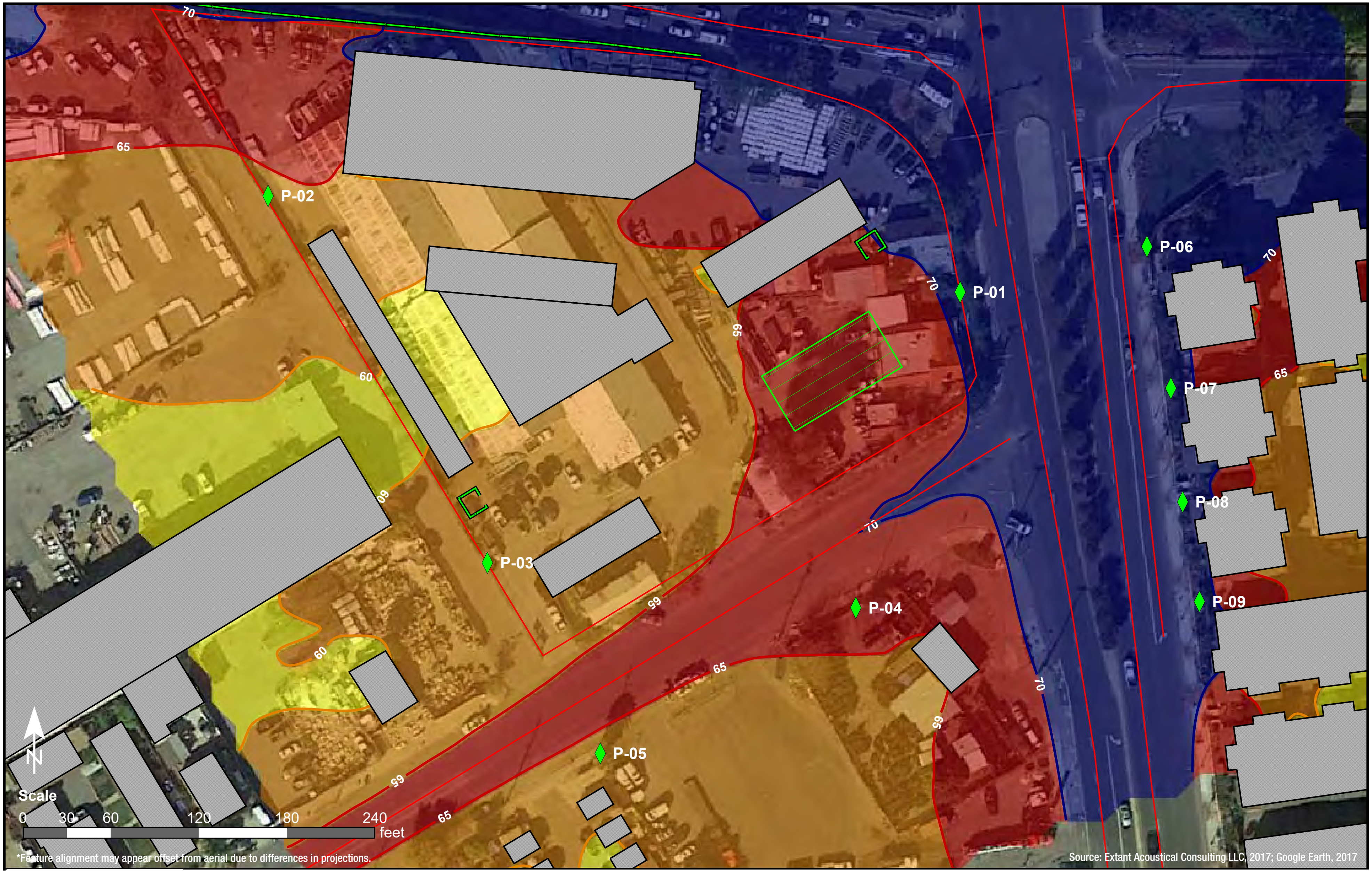
EXTANT ACOUSTICAL CONSULTING LLC

Published: 02/27/2017
Engineer: MJC



Signs and Symbols

- Project Area
- Receiver
- Building
- Road Emission

Noise Level
Ldn, dB(A)

- 45 - 50
- 50 - 55
- 55 - 60
- 60 - 65
- 65 - 70
- >= 70

Figure 5

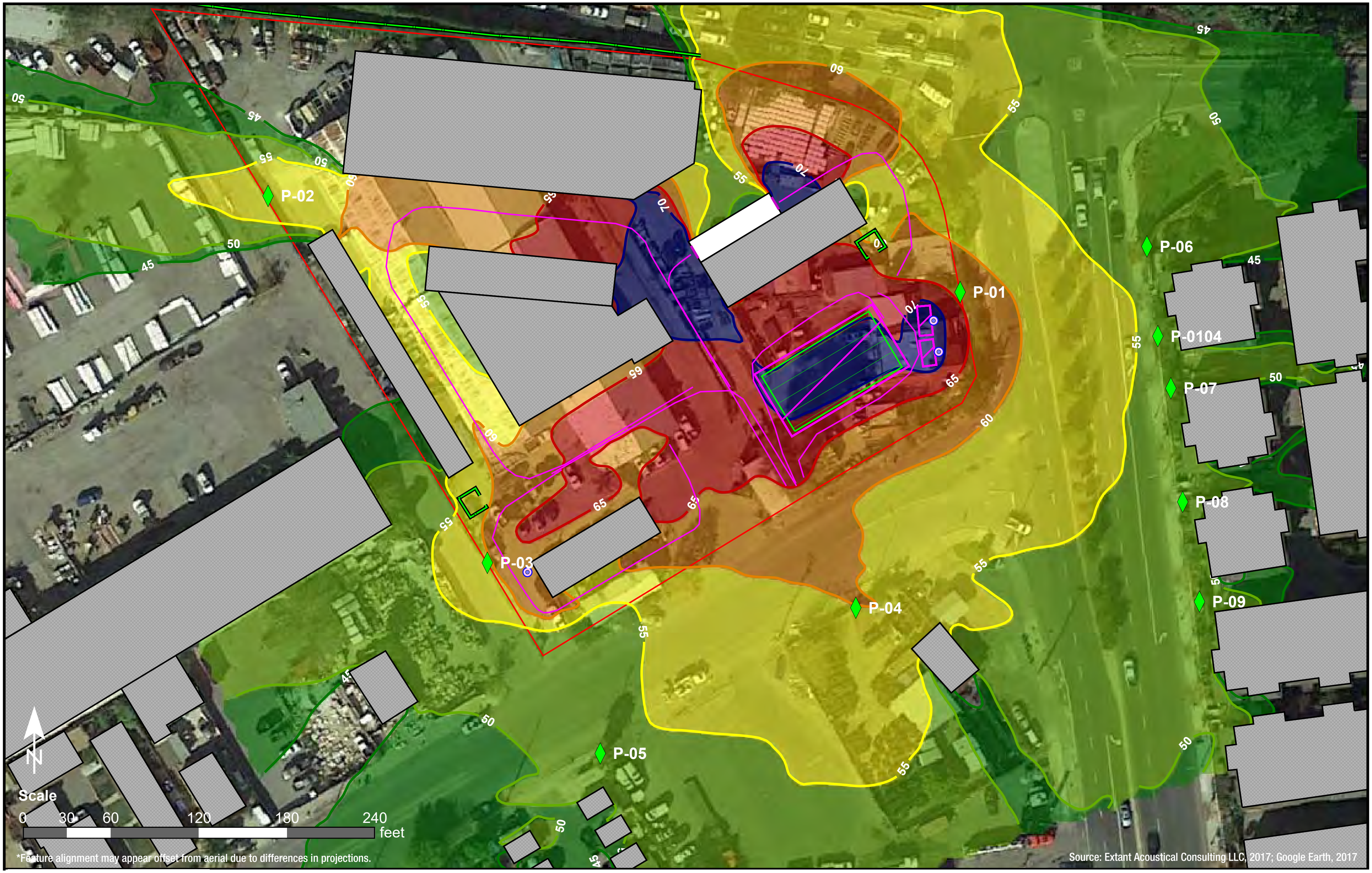
Baseline Plus Project Traffic Noise Levels

Day/Night Noise Level Contours, dBA Ldn
Prediction Recievers

Jim Rubnitz
645 Horning Street
San Jose, CA

EXTANT ACOUSTICAL CONSULTING LLC

Published: 02/27/2017
Engineer: MJC



Signs and Symbols

- Project Area
- Point source
- Receiver
- Building
- Auxiliary Structures
- Emission line
- Surface
- Bridge
- Wall

Noise Level
Ldn, dB(A)

45 - 50	
50 - 55	
55 - 60	
60 - 65	
65 - 70	
>= 70	

Figure 6

Project Operational Noise Levels

Day/Night Noise Level Contours, dBA Ldn
Prediction Recievers

Jim Rubnitz
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Published: 02/27/2017
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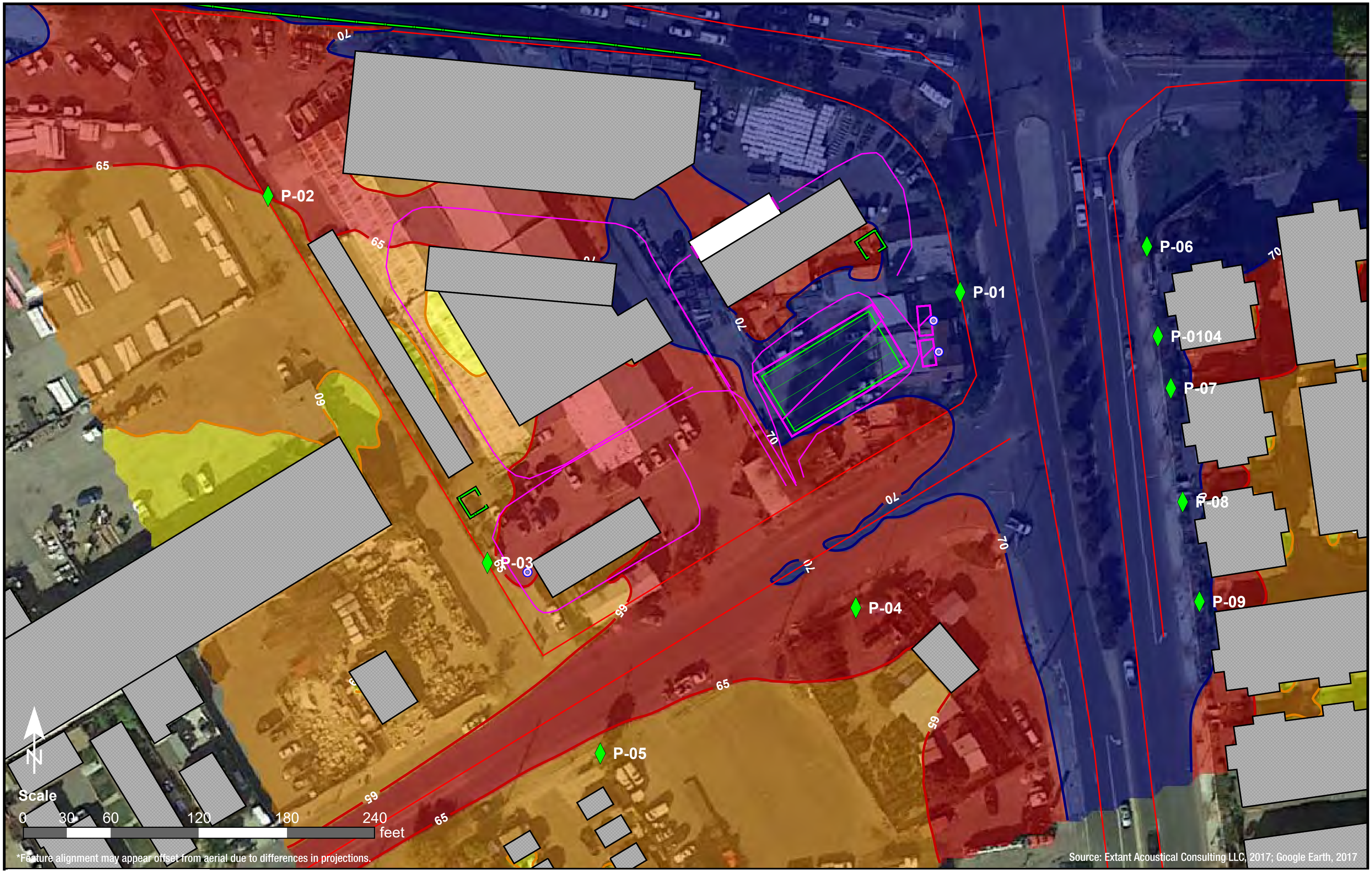

Signs and Symbols

- Project Area
- Receiver
- Building
- Parking lot
- Fueling Canopy
- Car Wash
- On-Site Traffic
- Emission line
- Point source

Noise Level
Ldn, dB(A)

- 45 - 50
- 50 - 55
- 55 - 60
- 60 - 65
- 65 - 70
- >= 70

Figure 7

Baseline Plus Project Operational Noise Levels

Day/Night Noise Level Contours, dBA Ldn
Prediction Recievers

Jim Rubnitz
645 Horning Street
San Jose, CA

EXTANT ACOUSTICAL CONSULTING LLC

Published: 02/27/2017
Engineer: MJC

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Appendix A Description of Noise Metrics

This Appendix describes the noise terminology and metrics used in this report.

A.1 A-weighted Sound Level, dBA

Loudness is a subjective quantity that enables a listener to order the magnitude of different sounds on a scale from soft to loud. Although the perceived loudness of a sound is based somewhat on its frequency and duration, chiefly it depends upon the sound pressure level. Sound pressure level is a measure of the sound pressure at a point relative to a standard reference value; sound pressure level is always expressed in decibels (dB), a logarithmic quantity.

Another important characteristic of sound is its frequency, or "pitch." This is the rate of repetition of sound pressure oscillations as they reach our ears. Frequency is expressed in units known as Hertz (abbreviated "Hz" and equivalent to one cycle per second). Sounds heard in the environment usually consist of a range of frequencies. The distribution of sound energy as a function of frequency is termed the "frequency spectrum." The frequency spectrum of sound is often represented as the sum of the sound energy in frequency bands that are one octave or 1/3-octave wide. An octave represents a doubling of frequency.

The human ear does not respond equally to identical noise levels at different frequencies. Although the normal frequency range of hearing for most people extends from a low of about 20 Hz to a high of 10,000 Hz to 20,000 Hz, people are most sensitive to sounds in the voice range, between about 500 Hz to 2,000 Hz. Therefore, to correlate the amplitude of a sound with its level as perceived by people, the sound energy spectrum is adjusted, or "weighted."

The weighting system most commonly used to correlate with people's response to noise is "A-weighting" (or the "A-filter") and the resultant noise level is called the "A-weighted noise level" (dBA). A-weighting significantly de-emphasizes those parts of the frequency spectrum from a noise source that occurs both at lower frequencies (those below about 500 Hz) and at very high frequencies (above 10,000 Hz) where we do not hear as well. The filter has very little effect, or is nearly "flat," in the middle range of frequencies between 500 and 10,000 Hz. A-weighted sound levels have been found to correlate better than other weighting networks with human perception of "noisiness." One of the primary reasons for this is that the A-weighting network emphasizes the frequency range where human speech occurs, and noise in this range interferes with speech communication. The figure below shows common indoor and outdoor A-weighted sound levels and the environments or sources that produce them.

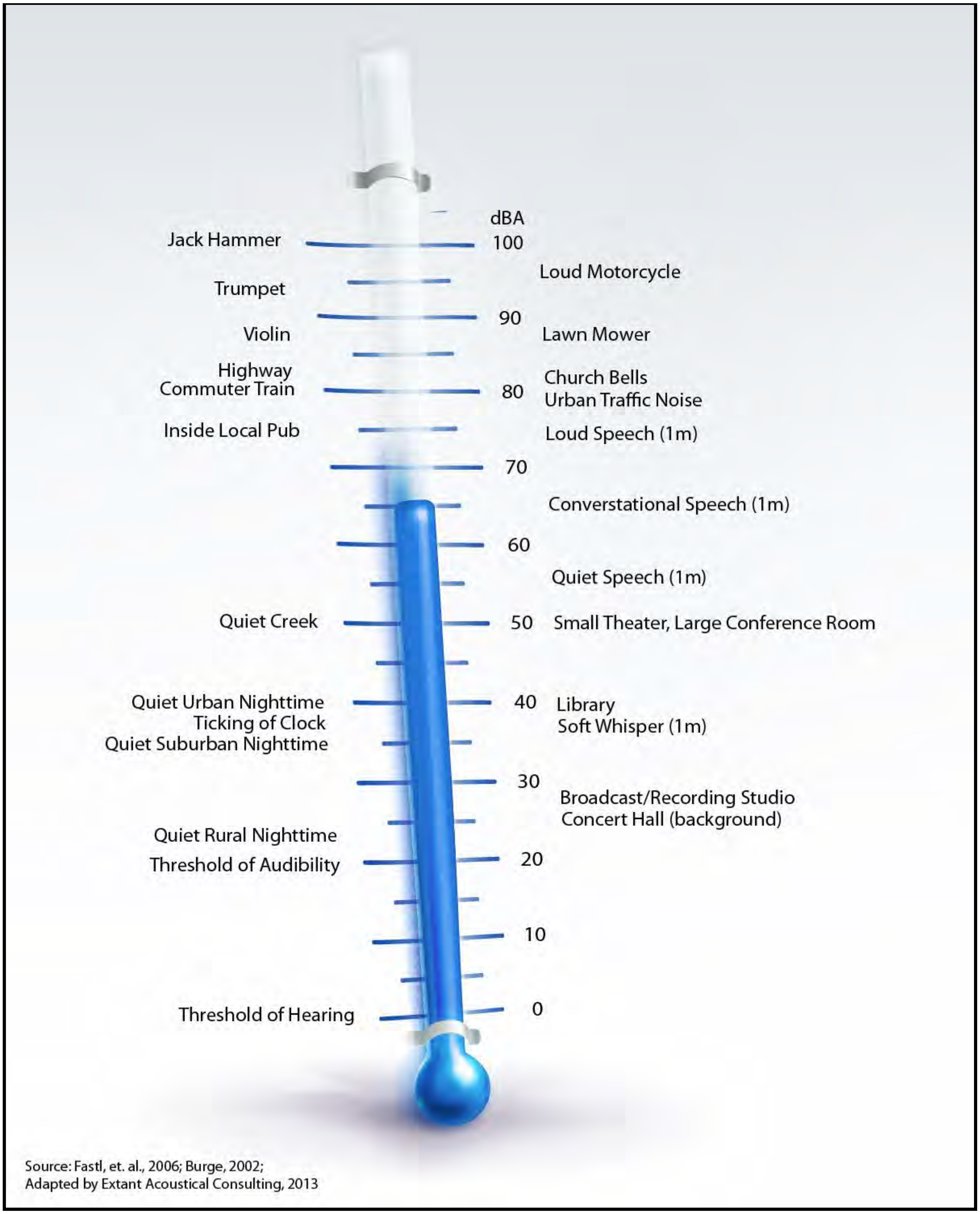


Exhibit A.1 – Common Noise Levels

A.2 Equivalent Sound Level, Leq

The Equivalent Sound Level, abbreviated L_{eq}, is a measure of the total exposure resulting from the accumulation of A-weighted sound levels over a particular period of interest -- for example, an hour, an 8-hour school day, nighttime, or a full 24-hour day. However, because the length of the period can be different depending on the time frame of interest, the applicable period should always be identified or clearly understood when discussing the metric. Such durations are often identified through a subscript, for example L_{eq1h}, or $L_{eq\ (24)}$.

L_{eq} may be thought of as a constant sound level over the period of interest that contains as much sound energy as (is "equivalent" to) the actual time-varying sound level with its normal peaks and valleys. It is important to recognize, however, that the two signals (the constant one and the time-varying one) would sound very different from each other. Also, the "average" sound level suggested by L_{eq} is not an arithmetic value, but a logarithmic, or "energy-averaged" sound level. Thus, the loudest events may dominate the noise environment described by the metric, depending on the relative loudness of the events.

A.3 Statistical Sound Level Descriptors

Statistical descriptors of the time-varying sound level are often used instead of, or in addition to L_{eq} to provide more information about how the sound level varied during the time period of interest. The descriptor includes a subscript that indicates the percentage of time the sound level is exceeded during the period. The L_{50} is an example, which represents the sound level exceeded 50 percent of the time, and equals the median sound level. Another commonly used descriptor is the L_{10}, which represents the sound level exceeded 10 percent of the measurement period and describes the sound level during the louder portions of the period. The L_{90} is often used to describe the quieter background sound levels that occurred, since it represents the level exceeded 90 percent of the period.

A.4 DNL (Day-Night Noise Level)

The 24-hour L_{eq} with a 10 dB "penalty" applied during nighttime noise-sensitive hours, 10:00 p.m. through 7:00 a.m. The DNL attempts to account for the fact that noise during this specific period of time is a potential source of disturbance with respect to normal sleeping hours.

A.5 CNEL (Community Noise Equivalent Level)

The CNEL is similar to the DNL described above, but with an additional 5 dB "penalty" for the noise-sensitive hours between 7:00 p.m. to 10:00 p.m., which are typically reserved for relaxation, conversation, reading, and television. If using the same 24-hour noise data, the CNEL is typically 0.5 dB higher than the DNL.

A.6 SEL (Sound Exposure Level)

The SEL describes the cumulative exposure to sound energy over a stated period of time; typically reference to one (1) second.

Appendix B Long-Term Noise Monitoring Data

Appendix B-1
Long-Term 24 Hour Continuous Noise Monitoring

Project: **645 Horning Street**
Date: January 17, 2017
Site: LT-01

Hour	Leq	Lmax	L50	L90
0:00	64.0	87.8	55.4	50.6
1:00	60.7	82.3	53.5	49.5
2:00	60.2	84.3	53.1	48.7
3:00	60.7	81.8	54.8	50.9
4:00	65.5	89.3	58.9	54.1
5:00	68.3	90.1	62.4	57.8
6:00	70.4	92.6	64.7	60.6
7:00	70.7	91.1	65.8	61.0
8:00	70.4	89.0	65.6	60.4
9:00	71.5	91.5	65.5	60.3
10:00	72.1	92.0	66.3	60.2
11:00	72.4	91.7	66.8	60.6
12:00	73.2	90.9	68.0	61.3
13:00	72.5	90.8	67.7	60.9
14:00	73.1	92.5	68.7	61.7
15:00	72.0	88.2	69.0	62.3
16:00	71.7	91.4	68.3	61.5
17:00	71.2	91.7	67.0	60.4
18:00	71.1	89.1	66.8	59.9
19:00	71.8	94.7	67.1	59.8
20:00	69.7	88.8	64.0	58.3
21:00	68.5	89.0	62.4	56.4
22:00	68.8	93.5	60.6	55.3
23:00	68.7	98.0	58.2	52.6

Lowermost Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	68.5	88.2	62.4	56.4
Nighttime (10 p.m. - 7 a.m.)	60.2	81.8	53.1	48.7

Average Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	71.6	90.8	66.6	60.3
Nighttime (10 p.m. - 7 a.m.)	66.7	88.9	58.0	53.3

Uppermost-Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	73.2	94.7	69.0	62.3
Nighttime (10 p.m. - 7 a.m.)	70.4	98.0	64.7	60.6

Energy Distribution

Daytime	84%
Nighttime	16%

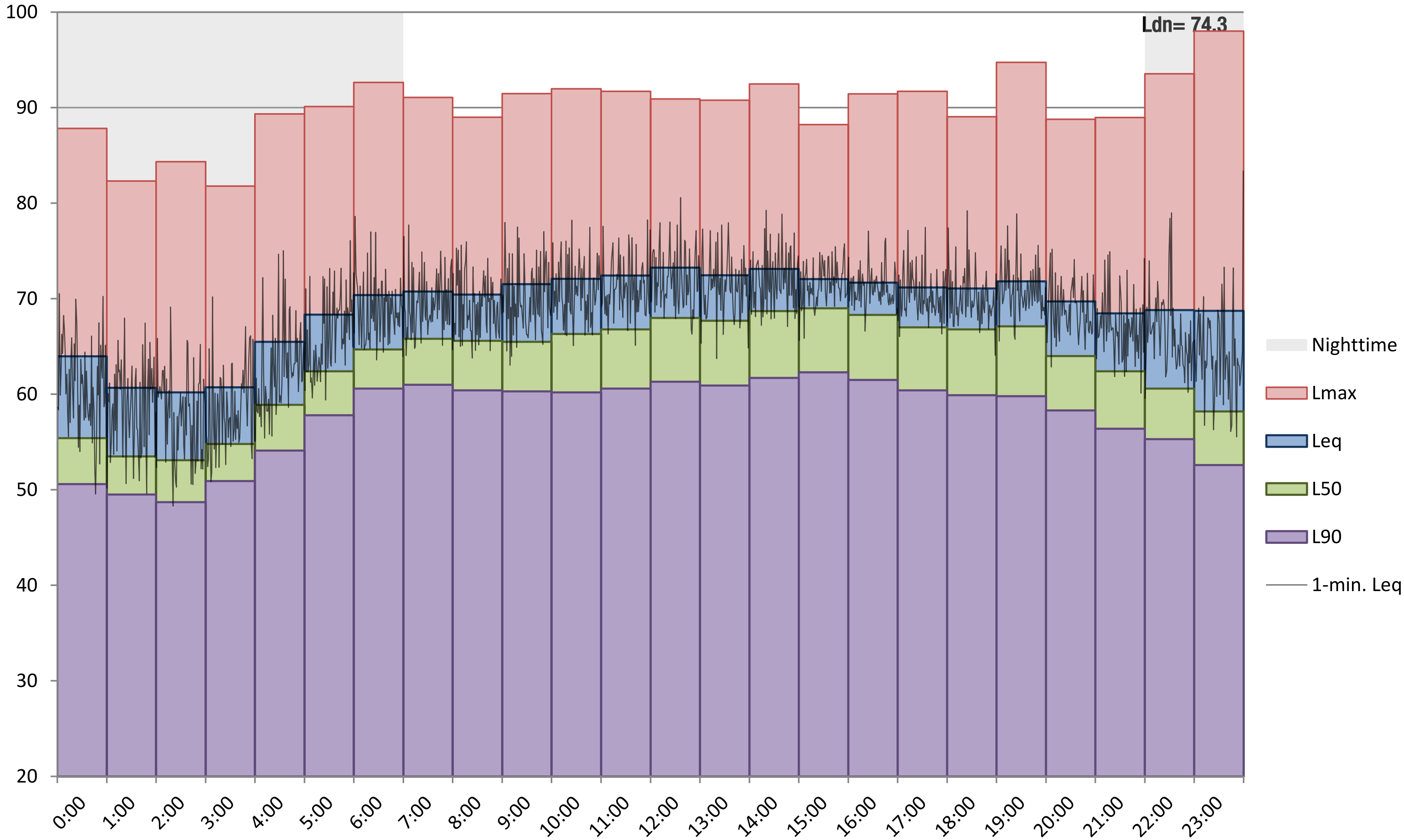
Calculated L_{dn}, dBA

74.3

Appendix B-1

645 Horning Street - LT-01

January 17, 2017



Appendix B-2
Long-Term 24 Hour Continuous Noise Monitoring

Project: **645 Horning Street**
Date: January 17, 2017
Site: LT-02

Hour	Leq	Lmax	L50	L90
0:00	59.6	78.0	52.5	49.2
1:00	58.5	76.5	51.0	47.7
2:00	58.0	74.7	50.2	46.6
3:00	60.0	78.3	51.9	48.4
4:00	62.9	80.2	56.4	50.9
5:00	67.3	84.0	63.6	55.3
6:00	69.0	85.7	66.6	59.9
7:00	68.8	84.3	67.1	61.5
8:00	69.3	84.1	67.4	61.4
9:00	68.8	85.2	66.8	61.5
10:00	69.2	87.2	67.0	61.7
11:00	70.5	88.4	67.0	60.7
12:00	69.2	83.3	67.4	63.6
13:00	69.1	86.5	67.3	62.5
14:00	72.0	94.4	66.9	62.7
15:00	68.4	84.5	66.7	62.5
16:00	69.9	96.1	66.0	62.0
17:00	68.6	94.6	63.8	60.1
18:00	66.2	88.6	63.5	60.0
19:00	67.1	87.6	64.8	59.2
20:00	65.3	84.6	62.8	55.1
21:00	64.6	85.5	61.1	51.3
22:00	63.0	80.8	59.1	51.0
23:00	61.5	77.2	56.4	49.6

Lowermost Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	64.6	83.3	61.1	51.3
Nighttime (10 p.m. - 7 a.m.)	58.0	74.7	50.2	46.6

Average Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	68.9	87.7	65.7	60.4
Nighttime (10 p.m. - 7 a.m.)	63.9	79.5	56.4	51.0

Uppermost-Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	72.0	96.1	67.4	63.6
Nighttime (10 p.m. - 7 a.m.)	69.0	85.7	66.6	59.9

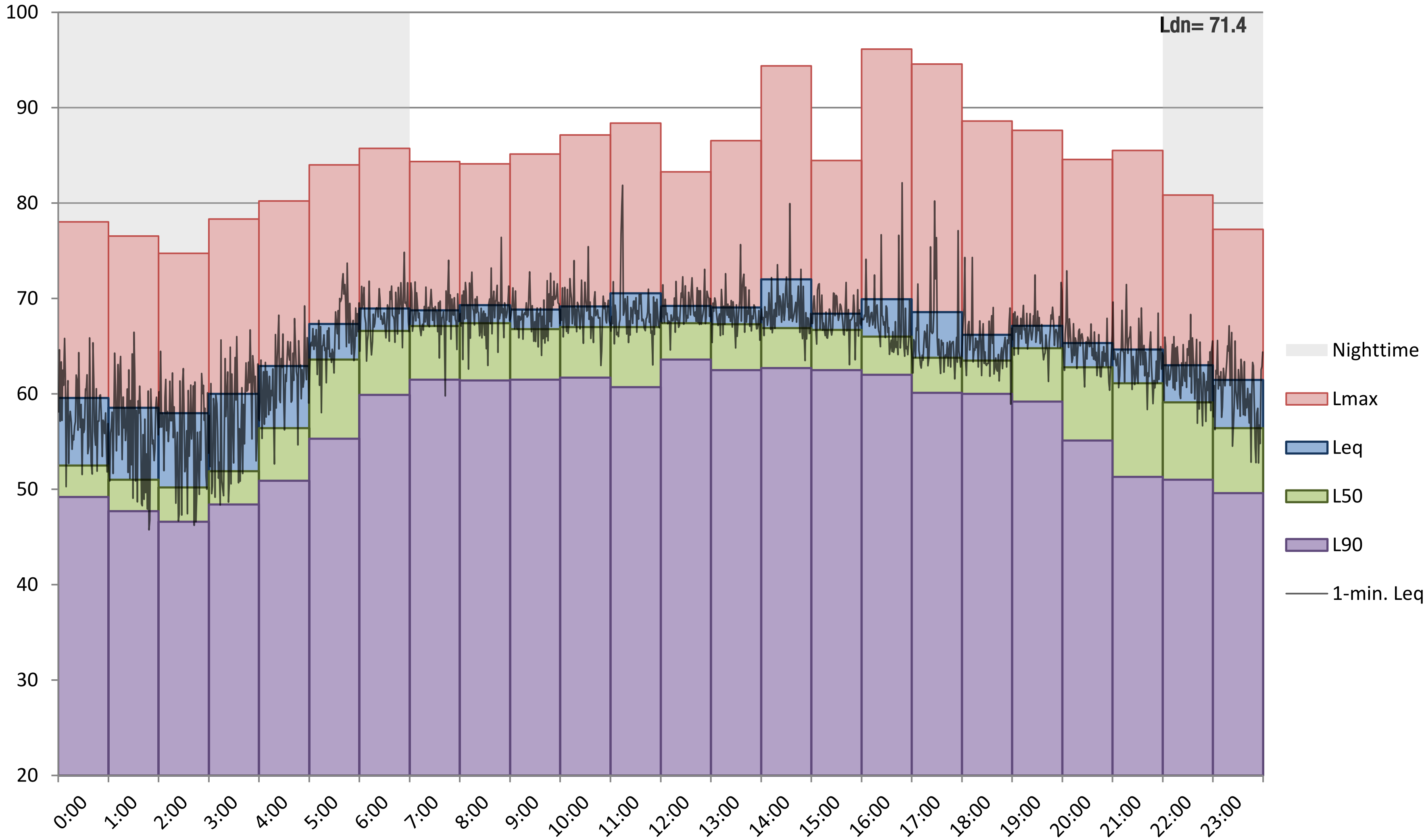
Energy Distribution

Daytime	84%
Nighttime	16%

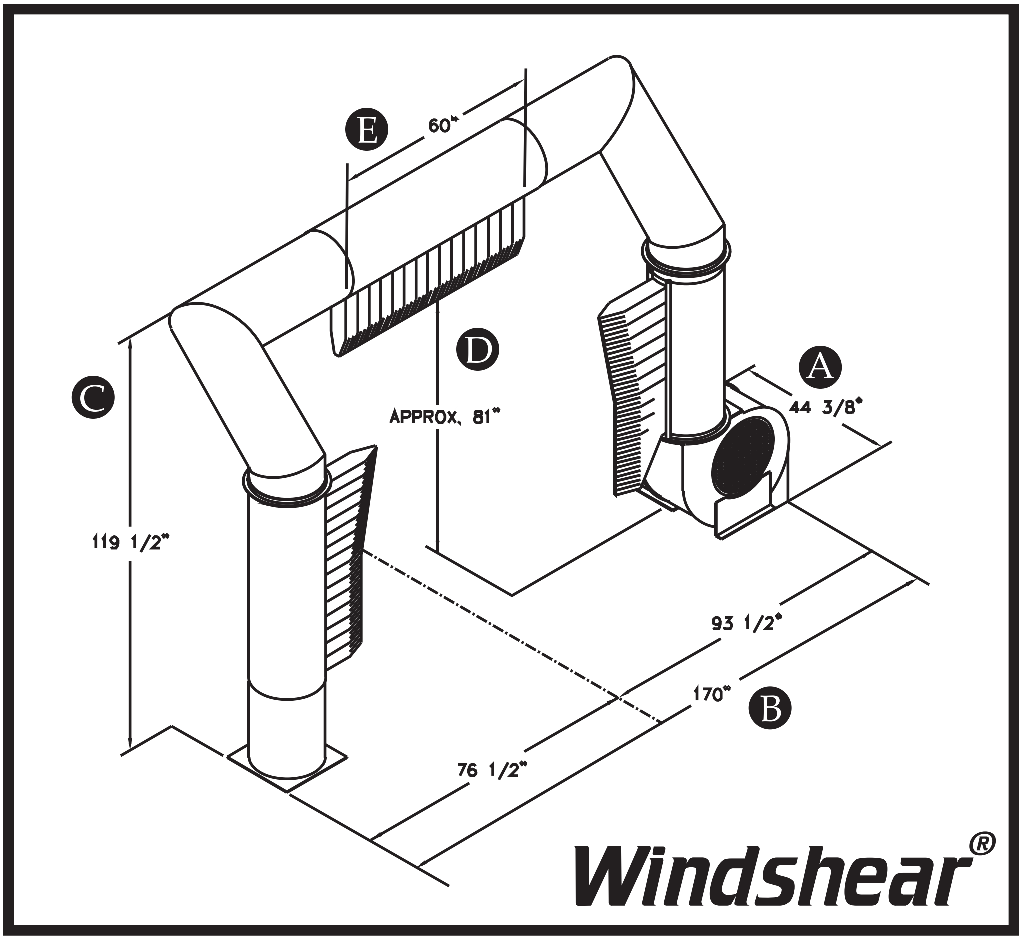
Calculated L_{dn}, dBA

71.4

Appendix B-2
645 Horning Street - LT-02
January 17, 2017



Appendix C Manufacturer Sound Level Data



EQUIPMENT

- **A** OVERALL LENGTH 44 ⅜ in.
- **B** OVERALL WIDTH 170 in.
- **C** OVERALL HEIGHT 119 ½ in.
- **D** BAG HEIGHT 81 in.
- **E** BAG WIDTH 60 in.

Machine Operating Requirements*

MOTORS

- 30 hp, 3600 RPM's
- 208-230 / 460 volts
- 1.25 service factor
- Frame: 286T
- 3 Phase
- Fan-cooled, totally enclosed

NOTE: Wiring and controls to be provided by the purchaser: Additional motor specifications available upon request. Additional voltages available on special order.

EQUIPMENT OPTIONS

- Colors: Blue or Red bags
- The Silencer Package
- Vehicle Recognition System (VRS)

Weight: 1250 lbs. (approximate)

GENERAL DESCRIPTION

The Proto-Vest "Windshear®" is designed as a stand alone drying system. It is ideal for tunnels with line speeds of up to 70 cars/hr, rollovers and self-service applications. This patented system utilizes one (1) 30 hp Magnum blowers, plenum and three (3) Proto-Duck™ air delivery bags designed to direct air around the vehicle as it passes under the equipment arch. Proto-Vest's blower/motor assemblies are engineered for both maximum efficiency and cost effectiveness. The magnum blower was designed to require only 30 hp to operate. With the improved blower performance of the Windshear® the drying quality far surpasses any comparable horsepower dryer in its class.

Proto-Vest's stringent standards in material selection for dryers result in extended equipment life and reduced maintenance. The blower assembly is manufactured from steel that is hot dipped galvanized and the impeller is electroplated. The blower is AMCA Class IV certified. The plenum is made from 5052-H32 aluminum, while the bags are produced from Proto-Duck™ materials. These materials resist corrosion and tearing.

FEATURES / BENEFITS

Patented Touchless Design: Pressurized air flows through three (3) patented bags which direct the air to the vehicle's horizontal and vertical surfaces. It dries the hood, roof, deck, windows, and sides of the vehicle without touching.

Low Maintenance: Other than the blower / impeller assemblies, there are no moving parts to wear-out or break down. (Please note that Proto-Vest recommends routine maintenance in order to maximize product life.)

Line Speed Efficiency: As a stand alone unit the "Windshear®" will give you approximately a 90% dry car at line speeds up to 70 cars per hour.

Compact / Modular design: Designed to fit into limited space as a stand alone or supplemental dryer.

DECIBEL READINGS

With Silencer / Without Silencer
(WS) (WOS)

Windshear® - (1) 30hp dryer:

WS: 10 ft=76.9 dBa;	WOS: 10 ft=91 dBa
WS: 20 ft=70.9 dBa;	WOS: 20 ft=84.9 dBa
WS: 30 ft=67.4 dBa;	WOS: 30 ft=81.4 dBa
WS: 40 ft=64.9 dBa;	WOS: 40 ft=78.9 dBa
WS: 50 ft=63 dBa;	WOS: 50 ft=77 dBa

(The above decibel readings are interpolated.)

SERVICE / SUPPORT

Proto-Vest recognizes that support after the sale of equipment is critical to the success of our customers. Our company offers its customers access to a wide range of services including: field service technicians, factory direct aftermarket parts, and an engineering staff for custom designed applications.

Proto-Vest Patents:
U.S.: 3,942,430; 4,161,801; 4,409,035; 4,418,442; 4,433,450; 4,445,251; 4,446,592; 4,589,160; 4,700,426; 5,027,714; 5,184,369; 5,187,881; 5,195,207; 5,280,665; 5,421,102; 5,553,346; 5,886,648; 5,901,461; 5,950,324; 5,960,564; 6,038,781; 6,176,024; 6,519,872; others pending.
Canada: 1,021,996; 1,111,328; 1,190,453; 1,201,040; 1,197,439; 1,219,195; 1,219,192; 1,219,194; 1,258,026; 1,219,193; 2,013,749; 2,071,568; 2,071,239; 2,071,388; others pending.

*Specifications subject to change without notice.
**If starting motor over 10-12 times an hour it may be more efficient to leave blower on.

Proto-Vest Inc.

Proto-Vest, Inc., 7400 N. Glen Harbor Blvd., Glendale, AZ 85307 • 800-521-8218 • 623-872-8300 • Fax 623-872-6150
www.proto-vest.com

Memo

Re: Drive-Thru Sound Pressure Levels From the Menu Board or Speaker Post

The sound pressure levels from the menu board or speaker post are as follows:

1. Sound pressure level (SPL) contours (A weighted) were measured on a typical HME SPP2 speaker post. The test condition was for pink noise set to 84 dBA at 1 foot in front of the speaker. All measurements were conducted outside with the speaker post placed 8 feet from a non-absorbing building wall and at an oblique angle to the wall. These measurements should not be construed to guarantee performance with any particular speaker post in any particular environment. They are typical results obtained under the conditions described above.

2. The SPL levels are presented for different distances from the speaker post:

Distance from the Speaker (Feet)	SPL (dBA)
1 foot	84 dBA
2 feet	78 dBA
4 feet	72 dBA
8 feet	66 dBA
16 feet	60 dBA
32 feet	54 dBA

3. The above levels are based on factory recommended operating levels, which are preset for HME components and represent the optimum level for drive-thru operations in the majority of the installations.

Also, HME incorporates automatic volume control (AVC) into many of our Systems. AVC will adjust the outbound volume based on the outdoor, ambient noise level. When ambient noise levels naturally decrease at night, AVC will reduce the outbound volume on the system. See below for example:

Distance from Outside Speaker	Decibel Level of standard system with 45 dB of outside noise without AVC	Decibel level of standard system with 45 dB of outside noise with AVC active
1 foot	84 dBA	60 dBA
2 feet	78 dBA	54 dBA
4 feet	72 dBA	48 dBA
8 feet	66 dBA	42 dBA
16 feet	60 dBA	36 dBA

If there are any further questions regarding this issue please contact HME customer service at 1-800-848-4468.

Thank you for your interest in HME's products.

HM Electronics, Inc. | 14110 Stowe Drive | Poway, CA 92064
phone: 800.848.4468 | fax: 858.452.7207 | www.hme.com