Diaz Road Expansion Project

Acoustical Analysis Report

Submitted to:

City of Temecula
41000 Main Street
Temecula, CA 92562

Prepared by:

HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942

December 2020 | DEA-12

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ACRONYMS AND ABBREVIATIONS

ANSI	American National Standards Institute
Caltrans	California Department of Transportation
CNEL	Community Noise Equivalent Level
dB	decibel
dBA	A-weighted decibel
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
Hz	Hertz
kHz	kilohertz
L_{DN}	Day Night sound level
L_{EQ}	time-averaged noise level
mph	miles per hour
mPa	micro Pascal
NSLU	noise sensitive land use
PPV	peak particle velocity
RCNM	Roadway Construction Noise Model
SPL	sound pressure level
TIA	Traffic Impact Analysis
TNM	Traffic Noise Model
USDOT	U.S. Department of Transportation

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EXECUTIVE SUMMARY

This report presents an assessment of potential construction and operational noise impacts associated with the proposed Diaz Road Expansion Project (project) located in the City of Temecula (City). The project proposes the expansion of Diaz Road from a two-lane roadway to a four-lane roadway between Cherry Street and Rancho California Road.

Construction activities would include site preparation, demolition, grading, drainage/utilities, and paving. Project construction noise would result in potentially significant noise levels above the City noise limits for commercial uses. This impact would be reduced to less than significant with implementation of mitigation measure NOI-1, which includes various measures to reduce construction noise. Vibration impacts from construction would not exceed thresholds for sensitive receptors.

The project would not result in an increase in operational traffic noise. The project's contribution to noise increases would be from moving the outer roadway lanes (and corresponding vehicle noise) closer to noise-sensitive hotels. However, the intervening distance and topography would attenuate any potential increase in noise levels. Therefore, noise impacts from project operation would be less than significant.

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1.0 INTRODUCTION

1.1 PROJECT LOCATION

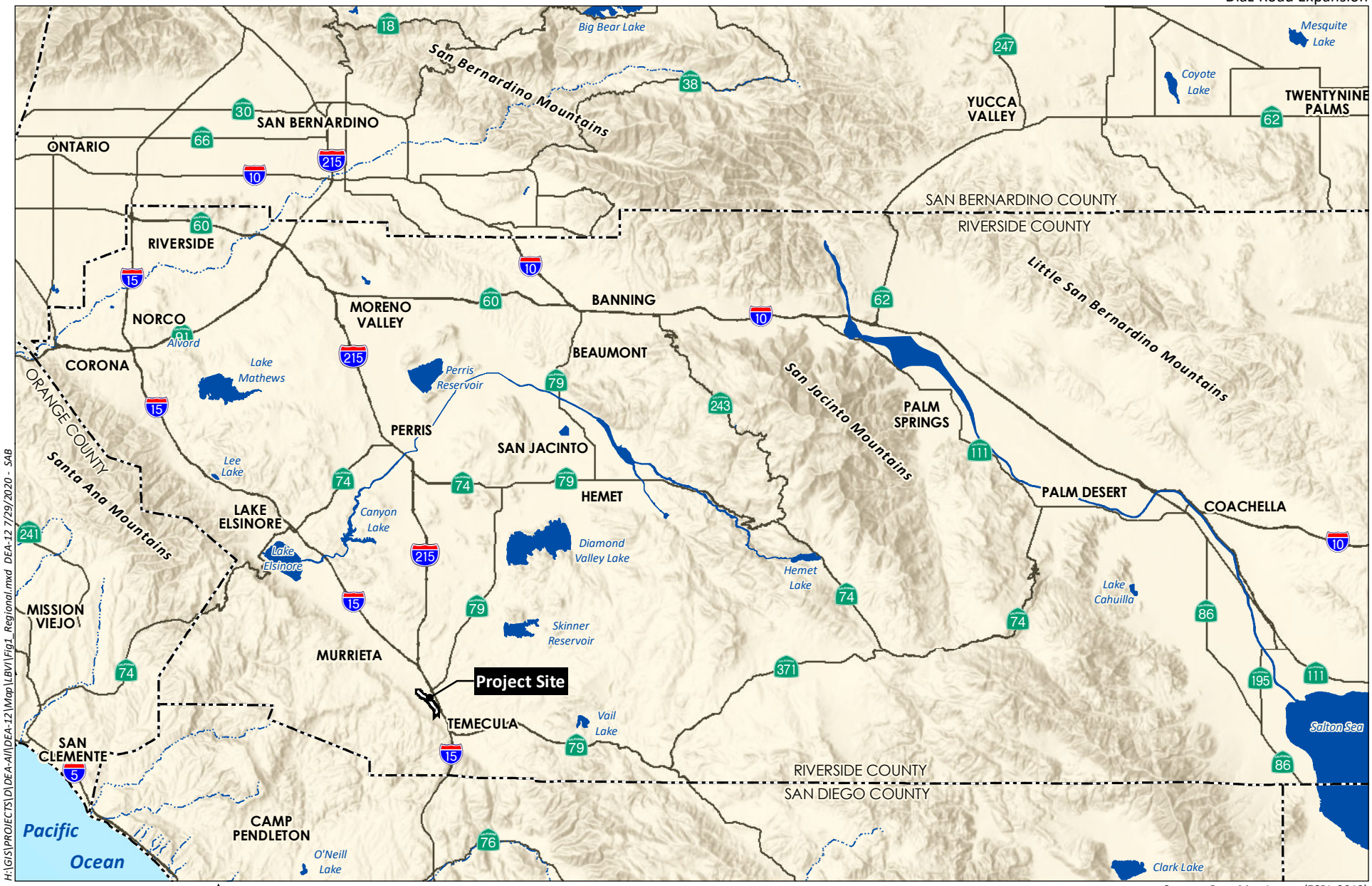
The Diaz Road Expansion Project (project) is located in the City of Temecula (City) in southwestern Riverside County. The project is located south of Interstate 215 (I-215) and Interstate 15 (I-15) interchange and west of I-15. The approximately 2.2-linear mile project site is bordered by Rancho California Road to the south, Cherry Street to the north, and Murrieta Creek to the east (see Figure 1, *Regional Location,* Figure 2, *USGS Topography*, and Figure 3, *Project Alignment*). The Assessor's Parcel Numbers (APNs) identified as being associated with the project site include segments of Diaz Road (APNs 909-120-006 and 909-370-050), the walking/biking pathway adjoining northeast of Diaz Road (APNs 921-740-004 and -005, and 909-120-016, -021, -040, -051 and -055), and several small walled/fenced enclosures containing utility and water company infrastructure along the northeast side of Diaz Road at several locations between Rancho California Road and Cherry Street (APNs 909-370- 051, 909-120-044 and -056, and 921-740-002).

1.2 PROJECT DESCRIPTION

The project proposes to expand Diaz Road to meet the roadway classification requirements of a major arterial with four divided lanes, as specified by City Standard No. 101, between Cherry Street and Rancho California Road. The standards call for a 100-foot minimum right-of-way, 76-foot roadway with a 14-foot raised median, and 12-foot parkways on each side of the road. The approximately 2.2-mile segment would be expanded on its current horizontal alignment and as depicted in the City's General Plan, Circulation Element, Figure C-2 Roadway Plan. As such, the proposed project would widen the existing Diaz Road segment and extend the northwestern end of Cherry Street. The project would complete the City's only existing north-south corridor west of Murrieta Creek. North of Cherry Street, this north-south corridor is planned to continue as Washington Avenue within the City of Murrieta.

The project site encompasses the existing Diaz Road segment between Rancho California Road to the south and Cherry Street to the north, and the adjacent areas into which the roadways would be widened. At the northernmost end of the project site (from Dendy Parkway to Cherry Street), Diaz Road transitions to an unimproved dirt road. All widening activities would occur on the northeast side of Diaz Road, which would infringe upon public walking and biking pathways as well as several small fenced/walled enclosures containing existing utility and water infrastructure (i.e., wells, piping, tanks, and small outbuildings). With the exception of the small outbuildings in these utility enclosures, there are no existing buildings on the project site. Land uses at the project site include mostly existing public roadway, a small portion of dirt road, portions of an adjoining public walking/biking pathway, and some undeveloped land. Land uses in the vicinity of the project site consist of industrial and commercial developments to the west and south, Murrieta Creek and public walking/biking pathways to the northeast, and mostly undeveloped land to the north. The elevation of the project site ranges from approximately 1,000 to 1,040 feet above mean sea level (AMSL) and the topography is relatively flat as a graded roadway, with an overall downward slope toward the southeast, and some localized sloping toward Murrieta Creek, which is located 200 feet to the northeast.

Signing and striping improvements for intersecting streets would be provided to the extent necessary to safely transition lane configurations and turning movements to existing improvements. These improvements would be in accordance with the latest edition(s) of the California Manual on Uniform



H:\GIS\PROJECTS\D\DEA-All\DEA-12\Map\LBVI\Fig1_Regional.mxd DEA-12 7/29/2020 - SAB

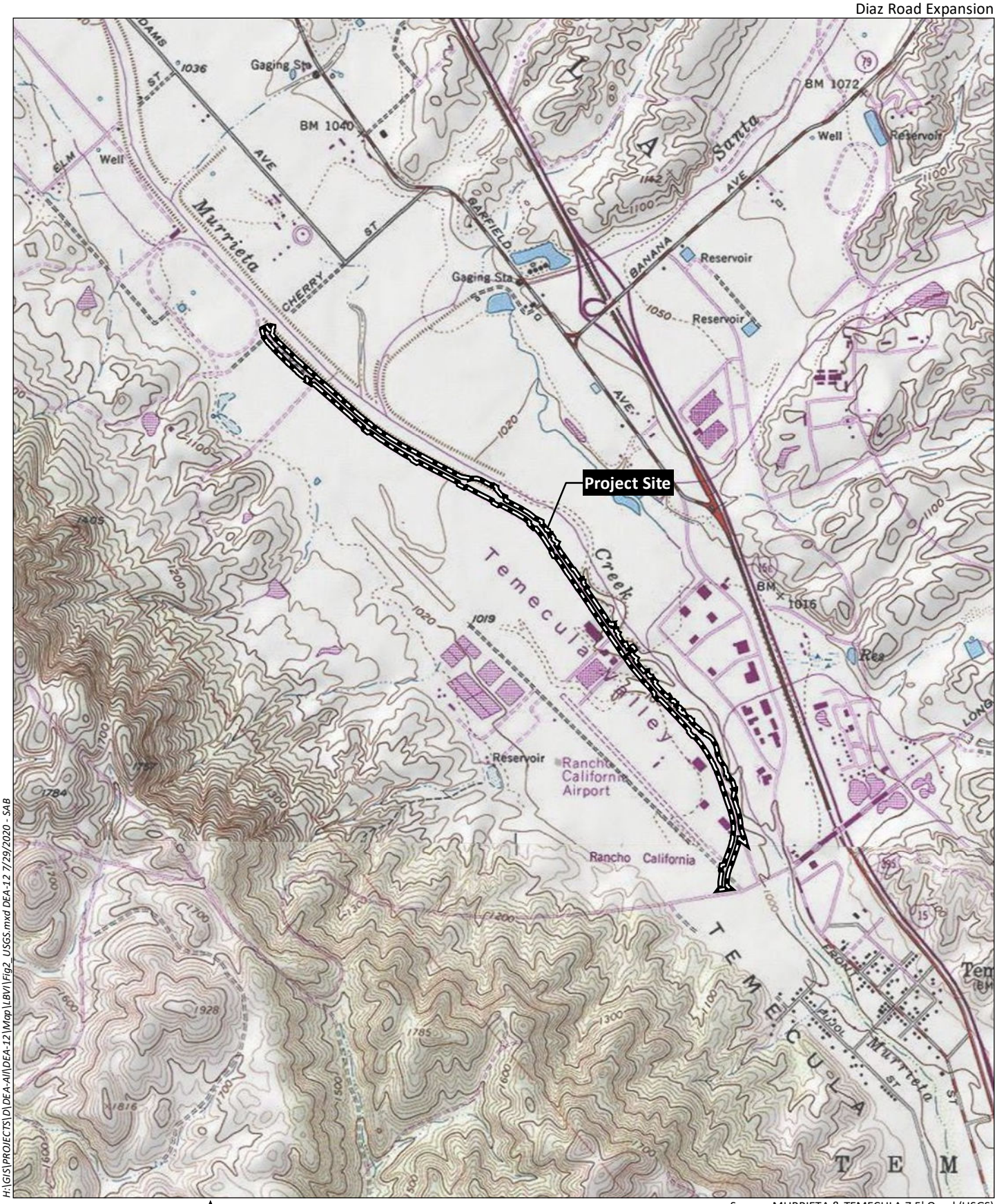
0 10 Miles

Source: Base Map Layers (ESRI, 2013)

HELIX Environmental Planning

Regional Location

Figure 1



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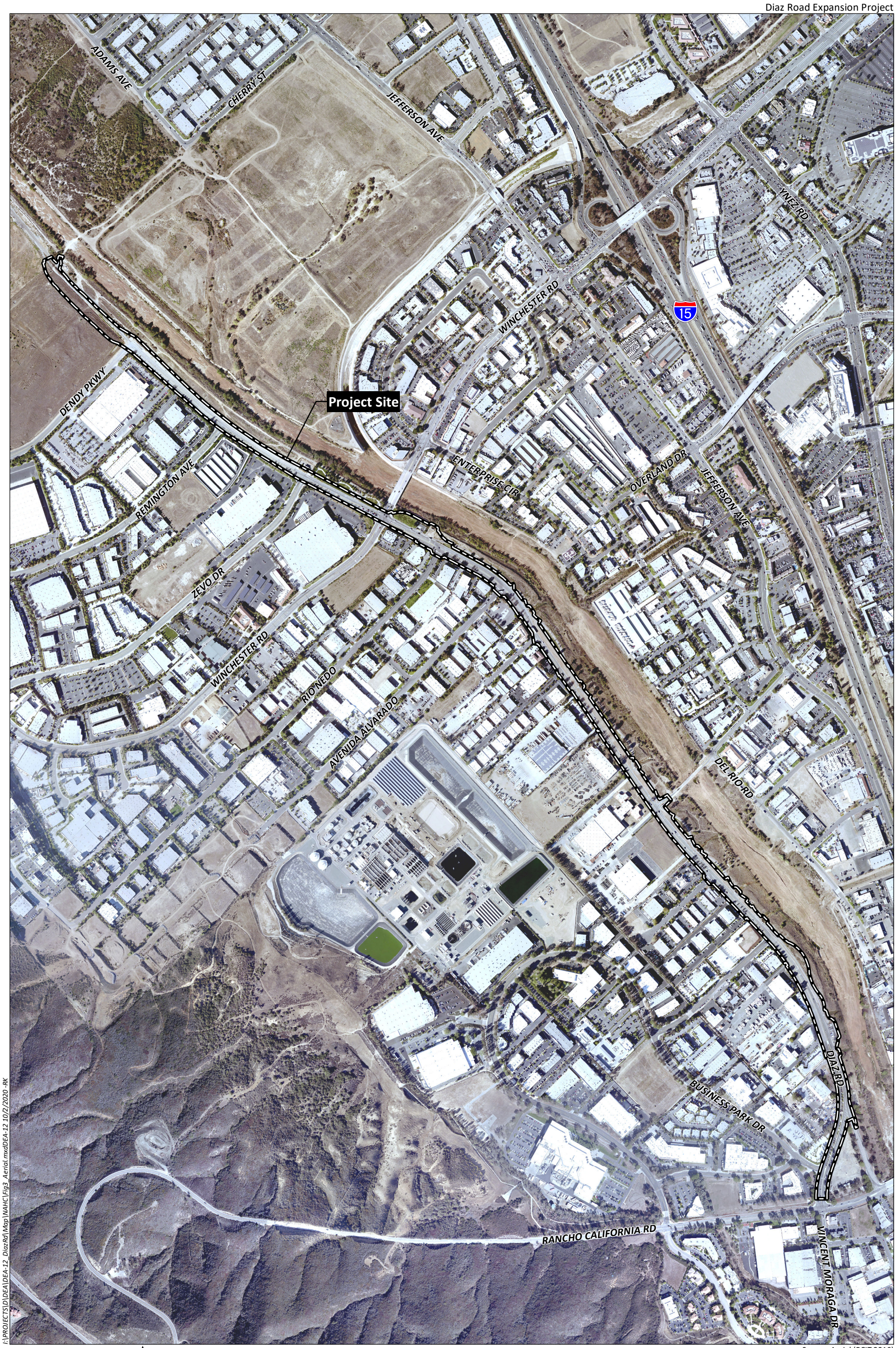
0 2,000 Feet

Source: MURRIETA & TEMECULA 7.5' Quad (USGS)

HELIX Environmental Planning

USGS Topography

Figure 2



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0 800 Feet

N

Source: Aerial (RCIT 2016)

HELIX Environmental Planning

Project Alignment

Figure 3

Traffic Control Devices (CA MUTCD) and the City's requirements and specifications. Signal modifications would be needed at the intersection of Winchester Road and Rancho Way to accommodate revised turning movements and the Diaz Road widening. Landscape and planting improvements would include decorative rock, boulders and hardscape improvements for the center median, easterly parkway, and westerly parkway where existing landscape improvements do not exist. The median and parkway improvements would be in accordance with the City's landscape guidelines. In addition, streetlights would be installed as appropriate according to the City's design standards for type, location, and spacing. Storm drains would also be installed as appropriate along the expanded roadway to include catch basins and low impact development improvements.

Construction would commence as early as January 2021 and require approximately 16 months to complete. Construction activities would include site preparation, demolition of existing roadway, grading, installation of drainage and utilities, retaining walls, and paving. During construction, material such as vegetation, soil, old asphalt and concrete may be exported from the site and material such as soil, aggregate, asphalt and concrete may be imported to the site.

2.0 ENVIRONMENTAL SETTING

2.1 NOISE AND SOUND LEVEL DESCRIPTORS AND TERMINOLOGY

All noise level or sound level values presented herein are expressed in terms of decibels (dB), with A-weighting (dBA) to approximate the hearing sensitivity of humans. Time-averaged noise levels are expressed by the symbol L_{EQ}, with a specified duration. The Community Noise Equivalent Level (CNEL) is a 24-hour average, where noise levels during the evening hours of 7:00 p.m. to 10:00 p.m. have an added 5 dBA weighting, and sound levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. have an added 10 dBA weighting. This is similar to the Day Night sound level (L_{DN}), which is a 24-hour average with an added 10 dBA weighting on the same nighttime hours but no added weighting on the evening hours. Sound levels expressed in CNEL are always based on dBA. The maximum sound level (L_{MAX}) is the maximum level during a measurement period or noise event. These metrics are used to express noise levels for both measurement and municipal regulations, as well as for land use guidelines and enforcement of noise ordinances.

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a hearing organ, such as a human ear. Noise is defined as loud, unexpected, or annoying sound.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver contribute to the sound level and characteristics of the noise perceived by the receiver. The field of acoustics deals primarily with the propagation and control of sound.

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes

more conveniently expressed in kilohertz (kHz), or thousands of Hertz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

The amplitude of pressure waves generated by a sound source determines the loudness of that source. A logarithmic scale is used to describe sound pressure level (SPL) in terms of dBA units. The threshold of hearing for the human ear is about 0 dBA, which corresponds to 20 micro Pascals (mPa).

Because decibels are logarithmic units, SPL cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3 dBA increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dBA higher than one source under the same conditions.

2.2 NOISE AND VIBRATION SENSITIVE LAND USES

Noise-sensitive land uses (NSLUs) are land uses that may be subject to stress and/or interference from excessive noise, such as residential dwellings, schools, transient lodging (hotels), hospitals, educational facilities, exterior recreational facilities, and libraries. Noise receptors are individual locations that may be affected by noise. There are no NSLUs adjacent to the project. The nearest NSLUs are two hotels along Jefferson Avenue, Marriott SpringHill Suites and Hampton Inn Suites, located approximately 1,000 feet and 700 feet from the project site east of Murietta Creek. Industrial and commercial land uses are generally not considered sensitive to noise. Land uses in the vicinity of the project site consist of industrial and commercial developments to the west and south, Murrieta Creek to the northeast, and mostly undeveloped land to the north. The undeveloped lands in the project vicinity are part of the City's Uptown Specific Plan: Murietta Creek Recreation and Open Space District and are therefore not planned for development.

Land uses in which ground-borne vibration could potentially interfere with operations or equipment, such as research, manufacturing, hospitals, and university research operations (California Department of Transportation [Caltrans] 2013) are considered "vibration-sensitive." The degree of sensitivity depends on the specific equipment that would be affected by the ground-borne vibration. In addition, excessive levels of ground-borne vibration of either a regular or an intermittent nature can result in annoyance to residential uses or schools. The nearest land uses in the project area that are subject to annoyance from vibration include the two hotels along Jefferson Avenue, Marriott SpringHill Suites and Hampton Inn Suites, located approximately 1,000 feet and 700 feet from the project site east of Murietta Creek. The nearest residental uses include single-family residences located 0.5-mile east of the project site along Ynez Road.

2.3 REGULATORY FRAMEWORK

Applicable noise standards for the proposed project are codified in the following City regulations:

2.3.1 City of Temecula General Plan Noise Element

The Noise Element of the City's General Plan provides noise standards for land use compatibility in Temecula as shown in Table 1, *City of Temecula Land Use Noise Standards*. The standards represent the maximum acceptable exterior noise level, as measured at the property boundary, which is used to determine the project's noise impacts. The conditionally acceptable exterior noise level in Temecula for a multi-family residential land use is 70 CNEL. The interior noise standard is 45 CNEL. Exterior noise

sources must be attenuated to approximately 60 CNEL in order to attain interior noise levels of 45 CNEL for residential uses. Feasible noise mitigation techniques would be incorporated to reduce noise levels if necessary.

Table 1
TEMECULA LAND USE NOISE STANDARDS

Land Use Zone	Land Use Designation	Maximum Exterior Noise Level (CNEL)	
		Interior	Exterior
Residential	Hillside Rural Very Low Low Low Medium	45	65
	Medium	45	70[1]
	High	45	70[1]
Commercial and Office	Neighborhood Community Highway Tourist Service	-	70
	Professional Office	50	70
Light Industrial	Industrial Park	55	75
Public/Institutional	Schools	50	65
	All others	50	70
Open Space	Vineyards/Agriculture	-	70
	Open Space	-	70

Source: Temecula General Plan Noise Element, Sound Level Limits
[1] Maximum exterior noise levels up to 70 CNEL are allowed for Multiple-Family Housing.

2.3.2 City of Temecula Municipal Code

The City's Municipal Code regulates noise produced by construction activities. Municipal Code, Chapter 9.20, Noise, Section 9.20.060, Special Sound Sources Standards, prohibits construction activity, when the construction site is within one-quarter mile of an occupied residence, between the hours of 6:30 p.m. and 7:00 a.m., Monday through Friday. Construction activities are only allowed between 7:00 a.m. and 6:30 p.m. on Saturdays. No construction activity shall be undertaken on Sunday or nationally recognized holidays unless exempted by Section 9.20.070 of the Temecula Municipal Code. Furthermore, public works projects of any federal, state or local entity or emergency work by public utilities are exempt from the provisions of this subsection.

2.4 EXISTING CONDITIONS

2.4.1 Surrounding Land Uses

The approximately 2.2 linear mile project site is bordered by Rancho California Road to the south, vacant land to the north, and Murrieta Creek to the east. Land uses in the vicinity of the project site consist of industrial and commercial developments to the west and south, Murrieta Creek and public walking/biking pathways to the northeast, and mostly undeveloped open space land to the north. The

nearest NSLUs are two hotels along Jefferson Avenue, Marriott SpringHill Suites and Hampton Inn Suites, located approximately 1,000 feet and 700 feet from the project site east of Murrieta Creek.

2.4.2 Existing Noise Conditions

2.4.2.1 Ambient Noise Survey

Two short-term ambient noise measurements were conducted during a site visit on October 20, 2020, along Diaz Road. The measured noise levels and related environmental conditions are shown in Table 2, *Noise Measurement Results*. See Appendix A, *Site Survey Measurement Sheets*, for survey notes.

Table 2
NOISE MEASUREMENT RESULTS

Measurement 1	
Date:	Tuesday, October 20, 2020
Conditions:	Temperature: 80°F. Wind Speed: 5 mph. 26 percent humidity.
Time:	10:33 a.m. – 10:48 a.m.
Location:	Northeast side of Diaz Road, approximately 40 feet to roadway centerline.
Measured Noise Level:	62.3 dBA L_{EQ}
Measurement 2	
Date:	Tuesday, October 20, 2020
Conditions:	Temperature: 80°F. Wind Speed: 5 mph. 26 percent humidity.
Time:	11:12 a.m. to 11:27 a.m.
Location:	Northeast side of Diaz Road, approximately 40 feet to roadway centerline.
Measured Noise Level:	64.1 dBA L_{EQ}

dBA = A-weighted decibel; L_{EQ} = time-averaged noise level

Traffic counts were recorded for automobiles, medium-size trucks (double-tires/two axles), and heavy trucks (three or more axles)[1]. Traffic counts for the timed measurement and the one-hour equivalent volume are shown in Table 3, *Recorded Traffic Volume and Vehicle Mix*.

Table 3
RECORDED TRAFFIC VOLUME AND VEHICLE MIX

Measurement	Traffic	Autos	MT[1]	HT[2]
Measurement 1	15-minute Count	225	5	1
	One-hour Equivalent	900	20	4
	Percent	**98%**	**1%**	**1%**
Measurement 2	15-minute Count	260	4	0
	One-hour Equivalent	1,040	16	0
	Percent	**99%**	**1%**	**0%**

[1] Medium Trucks (double tires/two axles)
[2] Heavy Trucks (three or more axles)
Note: Values have been rounded to nearest whole number.

[1] This measurement was taken during the COVID-19 pandemic, which led to reduced traffic throughout the region. Because of this, vehicular traffic during the measurement was likely lower than normal levels, and noise levels are therefore likely lower than what would be expected.

3.0 ANALYSIS METHODOLOGY AND ASSUMPTIONS

3.1 METHODOLOGY AND EQUIPMENT

The following equipment was used to measure existing noise levels at the project site:

- Larson Davis System LxT Integrating Sound Level Meters
- Larson Davis Model CAL250 Calibrator
- Windscreen and tripod for the sound level meter
- Digital camera

The sound level meter was field-calibrated immediately prior to the noise measurements to ensure accuracy. All sound level measurements conducted and presented in this report were made with a sound level meter that conforms to the American National Standards Institute (ANSI) specifications for sound level meters (ANSI SI.4-1983 R2006). All instruments were maintained with National Institute of Standards and Technology traceable calibration per the manufacturers' standards.

Project construction noise was analyzed using the Roadway Construction Noise Model (RCNM; USDOT 2008), which utilizes estimates of sound levels from standard construction equipment.

3.2 ASSUMPTIONS

3.2.1 Construction

Construction would require the use of equipment throughout the site for the full term of construction. Construction activities would include site preparation, demolition, grading, drainage/utilities/subgrade, and paving. Equipment anticipated to be used on site includes excavators, backhoes, loaders, generators, pavers, and rollers. The most likely source of vibration during project construction would be a vibratory roller, which may be used to achieve soil compaction as part of fill compaction. Table 4, *Construction Equipment Assumptions*, presents a summary of the assumed equipment that would be involved in each stage of construction.

Table 4
CONSTRUCTION EQUIPMENT ASSUMPTIONS

Phase	Equipment	Number
Grubbing/Land Clearing	Crawler Tractors	1
	Excavators	2
	Signal Boards	5
Grading/Excavation	Crawler Tractors	1
	Excavators	3
	Graders	2
	Rollers	2
	Rubber Tired Loaders	1
	Scrapers	2
	Signal Boards	5
	Tractors/Loaders/Backhoes	4
Drainage/Utilities/Sub-grade/Retaining Wall	Air Compressors	1
	Generator Sets	1
	Graders	1
	Plate Compactors	1
	Pumps	1
	Rough Terrain Forklifts	1
	Scrapers	1
	Signal Boards	5
	Tractors/Loaders/Backhoes	3
Paving	Pavers	1
	Paving Equipment	1
	Rollers	2
	Signal Boards	5
	Tractors/Loaders/Backhoes	3

Source: HELIX 2020

3.2.2 Operation

Vehicular Traffic Volumes

The Traffic Impact Analysis (TIA) was prepared for the project (Linscott, Law, & Greenspan Engineers[LLG] 2020) to describe the existing roadway and intersection functions under current conditions and to analyze future roadway and intersection functions following implementation of the proposed project, which involves improving Diaz Road from two lanes to four lanes between Cherry Street and Rancho California Road. The traffic volumes are shown in Table 5*, Traffic Volumes*. Anticipated future traffic noise levels are based on the long-term traffic volumes.

Table 5
TRAFFIC VOLUMES

Roadway Segment	Existing (2018)	Long-term (2040)
Diaz Road		
Rancho California Road to north of Rancho California Road	8,800	8,900
North of Rancho California Road to Via Montezuma	9,000	14,300
Via Montezuma to south of Avenue Alvarado / Overland Drive	9,100	13,400
South of Avenue Alvarado / Overland Drive to Dendy Parkway	3,700	7,000
Dendy Parkway to Cherry Street	NA	4,500

Source: LLG 2020. Project volumes are provided as average daily trips.

The posted speed limit for Diaz Road is 45 miles per hour (mph). Site visit observations, shown in Table 4, revealed relatively low numbers of heavy and medium trucks near the project site.

4.0 IMPACTS

4.1 GUIDELINES FOR THE DETERMINATION OF SIGNIFICANCE AND CONDITIONS OF APPROVAL

Implementation of the project would result in a significant adverse impact if it would exceed the following thresholds based on the City General Plan and Noise Ordinance, as applicable to the project:

Threshold 1: Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the Temecula General Plan or noise ordinance.

Impacts would be significant if the project would expose existing development to noise levels in excess of the Noise Compatibility Standards established in the City's General Plan Noise Element, provided in Table 2. For commercial uses, the exterior noise compatibility standard is 70 CNEL. For multi-family uses, the exterior noise compatibility standard is 65 CNEL.

Construction impacts would occur if the project generates construction noise that violates the limits established in the City Municipal Code, Chapter 9.20, Noise, Section 9.20.060, Special Sound Sources Standards, which prohibits construction activity, when the construction site is within one-quarter mile of an occupied residence, between the hours of 6:30 p.m. and 7:00 a.m., Monday through Saturday, and all day Sunday.

Threshold 2: Generate excessive ground-borne vibration or ground borne noise levels.

Excessive ground-borne vibration would occur if construction-related ground-borne vibration exceeds the "severe" vibration annoyance potential criteria for human receptors, as specified by Caltrans (2013), of 0.4 inches per second peak particle velocity (PPV), and 0.5 inches per second PPV for damage to older

residential structures for continuous/frequent intermittent construction sources (such as impact pile drivers, vibratory pile drivers, and vibratory compaction equipment).

Threshold 3: For a project located within the vicinity of a private airstrip or an airport land use plan, or where such a plan has not been adopted, within two miles of a public use airport or private airstrip, expose people residing or working in the project area to excessive noise.

An impact would occur if the project would expose land uses to noise levels that exceed the standards in the City's noise compatibility standard for that use.

4.2 ISSUE 1: INCREASE IN AMBIENT NOISE LEVELS

Would the project generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the Temecula General Plan or noise ordinance?

4.2.1 Exposure to Excessive Noise

The project's primary operational noise source would be vehicular traffic. According to the TIA prepared for the proposed project by LLG, the project would not result in a doubling of average daily trips (ADT; LLG 2020). A doubling of ADT would cause a doubling in noise (a 3 CNEL increase), which is often noticeable to sensitive receptors and would be perceived as a significant increase. The project would not generate nearly enough trips to result in a doubling of roadway noise. However, the project could contribute to noise increases to nearby land uses due to moving the outer roadway lanes (and corresponding vehicle noise) closer to the NSLUs. The nearest NSLUs to the project site are two hotels along Jefferson Road, Marriott SpringHill Suites and Hampton Inn Suites, located approximately 1,000 feet and 700 feet from the nearest portion of the project alignment.

Existing and future exterior noise levels were modeled using the Federal Highway Administration (FHWA) Traffic Noise Model (TNM). Existing and future traffic data is estimated based on volumes from the project's TIA (LLG 2020). The closest segment of the project alignment to a NSLU is north of Rancho California Road to Via Montezuma, at 700 feet from Hampton Inn Suites. As such, this roadway segment was modeled using TNM to analyze the project's potential change in ambient noise levels at nearby NSLUs. At a distance of 700 feet, the existing noise level with 9,000 daily trips is approximately 60.6 CNEL. As indicated in the TIA, build-out of the proposed project would increase ADT along this segment by 5,300 trips (LLG 2020). The project would result in a long-term increase to 14,300 daily trips, which corresponds to a noise level of approximately 62.4 CNEL.

A significant increase in noise levels would occur if project-added traffic results in an increase of 3 CNEL or more. An increase of 1.8 CNEL would not exceed 3 CNEL and would not be discernable to the human ear. In addition, given the comparatively small change in distance associated with expanding the road from two lanes to four lanes, the topography and intervening distance across Murrieta Creek would contribute to the negligible change in noise levels. Since project-added trips would not increase existing noise levels by 3 CNEL, transportation noise impacts to off-site land uses would be less than significant.

4.2.2 Construction Noise

4.2.2.1 Construction Equipment

The City's Municipal Code states that construction noise limits apply to projects within one quarter mile of an occupied residence. The hotels located along Jefferson Road, Marriott SpringHill Suites and Hampton Inn Suites, located approximately 1,000 feet and 700 feet from the nearest portion of the project alignment, were conservatively analyzed as occupied residences for the purposes of this analysis. The most substantial noise increases from construction activities that may affect off-site uses would occur during the grading phase. The loudest equipment used during this phase would be a grader and excavator. The equipment would be in operation for 40 percent of a typical construction hour. At a distance of 700 feet, the grading equipment would generate a noise level of 58.1 dBA L_{EQ}. The City does not adopt noise level standards for construction noise. However, construction would not occur between the hours of 6:30 p.m. and 7:00 a.m., Monday through Saturday, and all day Sunday, as required by the Municipal Code. Therefore, noise generated by construction equipment would be less than significant.

4.2.3 Mitigation Measures

Because impacts related to Issue 1 would be less than significant, no mitigation is required.

4.2.4 Significance of Impacts After Mitigation

Impacts would be less than significant without mitigation.

4.3 ISSUE 2: EXCESSIVE GROUND-BORNE VIBRATION

4.3.1 Impact Analysis

Construction activities known to generate excessive ground-borne vibration, such as pile driving or blasting, would not be conducted by the project. A possible source of vibration during general project construction activities would be a vibratory roller, which may be used for ground compaction beneath the roadway surface. A vibratory roller would generate approximately 0.046 inch per second PPV at a distance of 100 feet (Caltrans 2013). At this distance, vibration generated by the project would be lower than what is considered a "severe" impact for humans of 0.4 inches per second PPV, and the structural damage impact to older residential structures of 0.5 inches per second PPV. Furthermore, the nearest vibration-sensitive land use, the Hampton Inn Suites Hotel, would be approximately 700 feet from the project. Therefore, given the intervening distance between where a vibratory roller may be used and the nearest vibration sensitive land uses, impacts associated with the roller (and other potential equipment) would be less than significant.

4.3.2 Mitigation Measures

Because impacts related to Issue 2 would be less than significant, no mitigation is required.

4.3.3 Significance of Impacts After Mitigation

Impacts would be less than significant without mitigation.

4.4 ISSUE 3: AIRPORT NOISE EXPOSURE

Would the project expose people residing or working in the project area to excessive noise from a nearby public use airport or private airstrip?

4.4.1 Airport Noise

The project is subject to some distant aircraft noise, though the site is not located near an active airport. The nearest airports are the Bear Creek Airport, located approximately 4 miles to the north, and the French Valley Airport, located approximately 5 miles to the northeast. At these distances, no effects related to airport noise would occur at the project site, and impacts would be less than significant.

5.0 LIST OF PREPARERS

Brendan Sullivan	Noise Analyst
Jason Runyan	Noise Analyst, Quality Assurance Reviewer

6.0 REFERENCES

California Department of Transportation (Caltrans). 2013. Transportation and Construction Vibration Guidance Manual, Environmental Engineering, Hazardous Waste, Air, Noise, Paleontology Office. September.

City of Temecula. 2005. Temecula General Plan. Available at: https://temeculaca.gov/345/General-Plan

Federal Transit Administration (FTA). 2018. Transit Noise and Vibration Impact Assessment Manual. September. Available at: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf

HELIX Environmental Planning, Inc (HELIX). 2020. Diaz Road Air Quality and Greenhouse Gas Assessment. October.

Linscott, Law, and Greenspan Engineers (LLG). 2020. Traffic Impact Analysis for the Diaz Road Improvements Project.

U.S. Department of Transportation (USDOT). 2008. Roadway Construction Noise Model.

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Appendix A

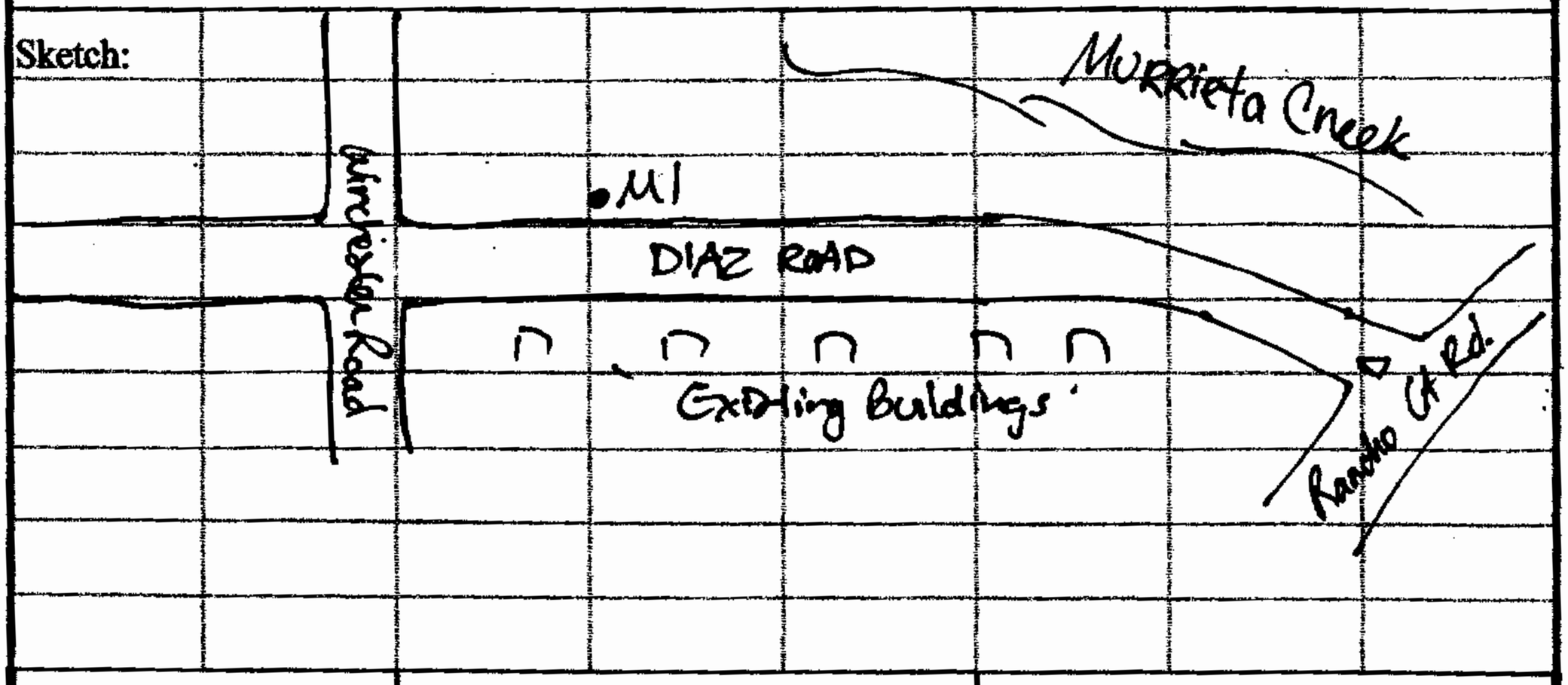
On-site Noise Measurement Sheets

Site Survey

Job # DEA-12		Project Name: Diaz Road Expansion	
Date: 10/20/20	Site #: M1	Engineer: Brendan Sullivan	
Address: Diaz Rd. Temecula, CA			
Meter: LD 831	Serial #: 1741	Calibrator: CAL250	Serial #: 2621

Notes: Light Breeze, ambient nature sounds, traffic noise from Diaz Rd and Winchester Road.

Sketch:



Temp: 80°	Wind Spd: 5 mph	Humidity: 26 %	
Start of Measurement: 10:33	End of Measurement: 10:48	62.3 dBA L_{EQ}	

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)
𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 225 cars	𝍸 5 M. trucks	I I HT

Noise Measurement for Information Only

No Through Roadways

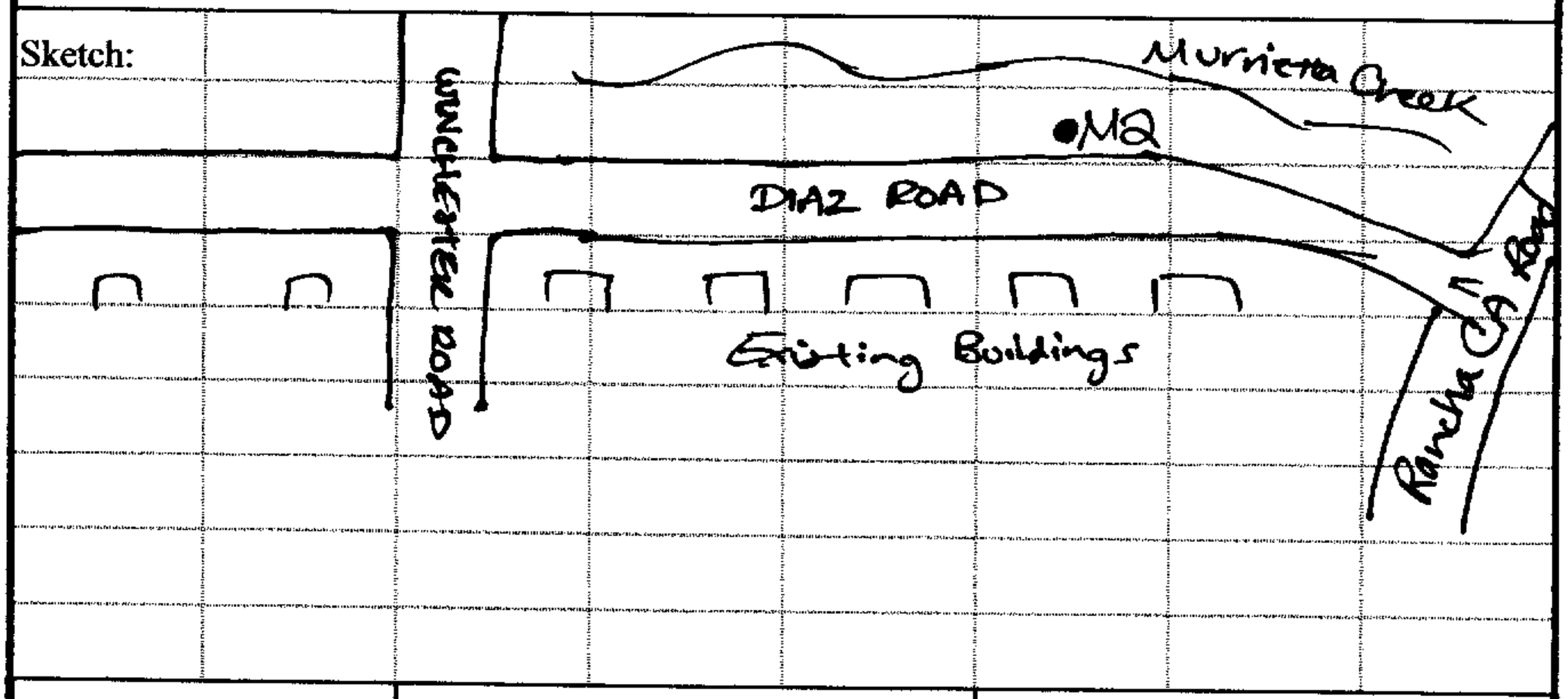
No Calibration Analysis Will Be Provided

Site Survey

Job # DEA-12		Project Name: Diaz Road Expansion	
Date: 10/20/20	Site #: M2	Engineer: Brendan Sullivan	
Address: Diaz Road, Temecula, CA			
Meter: LD 831	Serial #: 1741	Calibrator: CA250	Serial #: 2621

Notes: Light breeze, ambient nature sounds, distant aircraft, and traffic noise from the Roadway.

Sketch:



Temp: 80°	Wind Spd: 5 mph	Humidity: 26 %
Start of Measurement: 11:12	End of Measurement: 11:27	64.1 dBA L_{EQ}

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)
260 CARS	4 MT	0 HT

Noise Measurement for Information Only

No Through Roadways

No Calibration Analysis Will Be Provided

Appendix B

Construction Noise Model Outputs

Equipment	Reference @ 50 ft dBA L_{MAX}	Percentage	Use per day (hours)	Ordinance Limits (Hours)	Reference @ 50 ft. Noise Levels (dBA Leq)		Measured Distance (ft)	Noise Levels at Distance (dBA Leq)		Ordinance Limit (dBA Leq)	Distance to Ordinance Limit (ft.)
Noise Sum	85.0	N/A	N/A	N/A	85.3	#	1000.0	59.3	#	70	291.8
Truck (Dump Truck, Flatbed Truck)	76.5	40%	8	8	72.5	#	1000.0	46.5	#	70	66.8
Excavator	80.7	40%	8	8	76.7	#	1000.0	50.7	#	70	108.4
Loader	79.1	40%	8	8	75.1	#	1000.0	49.1	#	70	90.2
Portable Generator	80.6	50%	8	8	77.6	#	1000.0	51.6	#	70	119.8
Welder	74.0	40%	8	8	70.0	#	1000.0	44.0	#	70	50.1
Backhoe	77.6	40%	8	8	73.6	#	1000.0	47.6	#	70	75.9
Paver	77.2	50%	8	8	74.2	#	1000.0	48.2	#	70	81.0
Grader	85.0	40%	8	8	81.0	#	1000.0	55.0	#	70	177.8

Equipment	Reference @ 50 ft dBA L_{MAX}	Percentage	Use per day (hours)	Ordinance Limits (Hours)	Reference @ 50 ft. Noise Levels (dBA Leq)		Measured Distance (ft)	Noise Levels at Distance (dBA Leq)		Ordinance Limit (dBA Leq)	Distance to Ordinance Limit (ft.)
Noise Sum	85.0	N/A	N/A	N/A	85.3	#	700.0	62.4	#	70	291.8
Truck (Dump Truck, Flatbed Truck)	76.5	40%	8	8	72.5	#	700.0	49.6	#	70	66.8
Excavator	80.7	40%	8	8	76.7	#	700.0	53.8	#	70	108.4
Loader	79.1	40%	8	8	75.1	#	700.0	52.2	#	70	90.2
Portable Generator	80.6	50%	8	8	77.6	#	700.0	54.7	#	70	119.8
Welder	74.0	40%	8	8	70.0	#	700.0	47.1	#	70	50.1
Backhoe	77.6	40%	8	8	73.6	#	700.0	50.7	#	70	75.9
Paver	77.2	50%	8	8	74.2	#	700.0	51.3	#	70	81.0
Grader	85.0	40%	8	8	81.0	#	700.0	58.1	#	70	177.8