APPENDIX H

Fire Response Technical Memorandum

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FIRE RESPONSE TECHNICAL MEMORANDUM

To:	
From:	Dudek Fire Protection Planning Team, Michael Huff, Principal
Subject:	Hughes Circuits Fire and Medical Response Analysis
Date:	January 5, 2023
cc:	N/A
Attachment(s):	1. Hughes Circuits Project Location Exhibit 2. Hughes Circuits Project Site 3. San Marcos Fire Department Fire Station 1 Modeled Response Time 4. San Marcos Fire Department Fire Station 2 Modeled Response Time

The following technical memorandum provides a summary of Dudek's fire service response analysis for the Hughes Circuit Project (Project) in San Marcos, California. This letter provides a preliminary summary of the existing San Marcos Fire Department's (SMFD) nearby resources, their modeled travel time responses into the Project, and their existing call volumes. The goal is to determine the potential impact of the Project on the SMFD.

1 Assignment

Dudek's assignment was to:

- Conduct evaluation of existing, nearby SMFD fire station travel times to the project site;
- Acquire existing call volumes for nearby stations to determine their current work load;
- Analyze generated information to determine if any of the Project site cannot be reached within the City's response time goal; and
- Analyze call volume information to determine if the Project's projected call load would significantly impact the ability of existing stations to provide response to the Project.

2 Project Description

The proposed Project is the development of a vacant fourteen-acre site located at on the northeast corner of South Pacific Street in the western central region of the City of San Marcos, California (Figure 1, Project Location). The Project site is located on the 7.5-minute San Marcos quadrangle map on Township 12 South, Range 3 West of the San Bernardino Base and Meridian. It comprises Tax Assessor parcel numbers – APN 219-223-20-00 and 219-

223-22-00. The site is General Plan designated LI-Light Manufacturing and Zoned PD-LI – Planned Development – Light Manufacturing.

The Project includes a Plot Plan and Design Review to construct a 67,410 square-foot building comprised of a 56,310 square foot manufacturing/warehouse space on the first floor, a 11,100 square foot office on the mezzanine, and 72 parking spaces. An ingress/egress driveway will provide access to the Project off South Pacific Street.

The Project is located within the jurisdiction of the SMFD. The fire department provides structural fire protection and advanced life support-level emergency medical services within the City limits; unincorporated territory adjacent to the city's northern boundary (Project Area); discontinuous, unincorporated areas between the City of San Marcos and the City of Escondido; and the community of Lake San Marcos. The fire department operates two Fire Stations (Stations 1 and 2) that would respond to an incident at the proposed Project site, although primary response would be from Station 2, with Station 1 responding as necessary. Table 1 presents a summary of the location, equipment, and staffing levels for the two SMFD stations responding to the site.

Table 1
SMFD Responding Fire Stations Summary

Fire Station	Location	Equipment	Staffing
Station 1	180 W. Mission Road San Marcos, California 92069	Paramedic Engine Co. Paramedic Truck Co. Wildland Fire Engine Paramedic Ambulance Battalion Chief Vehicle	On duty: 9
Station 2	1250 S. Rancho Santa Fe Rd San Marcos, California 92069	Paramedic Engine Co. Paramedic Ambulance	On-duty: 5

3 Methods

3.1 Travel Time Response Modeling

Dudek conducted a GIS-based travel time coverage modeling effort in order to determine if the project meets the SMFD's response goal. The SMFD indicates "the average initial total response standard in the City of San Marcos is to arrive within seven minutes for 90% of the emergency calls received, and within 10 minutes for 90% of the non-emergency calls received[1]."

[1] 2021 Call volume, response standard, and fire station statistics provided by Jason Nailon, SMFD Fire Marshal, via e-mail communication. July 12, 2018.

Travel time is one part of the overall response time and is based largely on the distance from the fire station to the project. The analysis that follows evaluates travel time and assumes the dispatch and turnout times as a constant i.e., 2 minutes and 30 seconds, total.

3.2 GIS Response Travel Time Modeling

Following compilation of all necessary data layers received from project applicant and acquired via publicly available sources, Dudek verified that all data layers were in the correct State Plane Zone coordinate system with units in feet. A network data set was then created utilizing ESRI's Network Analyst extension in the Arc Catalog module. The data set was created by merging the existing centerline street layer with the proposed Sunrise Project centerline street data, provided by project applicants, and assigning parameters to the created data set. Several parameters are available during the creation of a network data set and include elevation constraints, U-turn capabilities, curb approach direction and travel impedance.

Due to the emergency nature of the response scenarios modeled in this analysis, U-turns were permitted on every road. Curb approach determines on which side of the street the vehicle needs to approach and includes three options, left, right, or either. The 'either' option was selected for all roads in this analysis based on the emergency nature of the response situations. Finally, travel impedance was utilized to include the effect of speed limits on response travel time. A custom impedance value was created for each road segment and was a function of road segment distance (miles) divided by speed (mph). This value was utilized in Network Analyst calculations for both modeling types and reflected the time necessary for a vehicle to cover the distance of the road segment. Speed was set at 35 mph, consistent with National Fire Protection Association (NFPA) 1142 Table C.11(b) and the Insurance Services Office (ISO) travel time formula (T=0.65 +1.7D).

Once the network data set parameters were finalized, the route analysis was run using the Network Analyst extension in ArcGIS 10.2.2. This function determines the best route between a minimum of two points based on the parameters chosen. The analysis includes response from SMFD Fire Stations 1 and 2, which are the closest stations to the Sunrise Project. A route analysis procedure was then run using Network Analyst with each respective fire station as the starting point, and a remote location within the Project as the destination. The maps depicting each Station travel time coverage area are presented in Attachments 3 and 4.

3.3 Modeling Results

As indicated in Table 2 and Attachments 2 and 3, response to the project site from the closest existing SMFD fire station (Station 2) would arrive at the Project's entrances between 3:37 and 3:50 minute travel time (6:07 to 6:40 minute total response time). This results in up to 53 seconds to drive within the Project site to the most remote unit, which is achievable based on the Project site's roads and smaller overall size. This analysis indicates that the first arriving paramedic engine and ambulance from Station 2 can respond within SMFD's seven minute total response goal (including one minute for dispatch and 1.5 minutes for turnout) to an estimated 100% of the project site. The other modeled SMFD Fire Station (Station 1) is further away from the site and would have travel times of 4:52 to 5:02 minutes and total response times ranging from 7:22 to 7:32 minutes.

Table 2
SMFD Fire Station Time Response to Project

Call Response Times	Estimated Percent of Hughes Circuit Project Achievable			
	Fire Station 1		*Fire Station 2*	
	Travel Time	*Total Response Time*	*Travel Time*	*Total Response Time*
Less than 5 minutes	10% to 15%	10% to 15%	100%	100%

3.4 Response Time Capability Assessment

The project includes construction of a new light-industrial building and associated parking. The proposed building would employ approximately 60 workers. Service level requirements could, in the absence of fire facilities and resources improvements, cause a decline in the SMFD response times and capabilities for existing residents in the surrounding area. However, it is clear that from a response time perspective, the project does comply with the City's total response time standard.

4 Call Volume Analysis

4.1 Estimated Calls and Demand for Service from the Project

The SMFD estimates approximately 11,486 total annual calls (Nailon, J. 2021) and a City population of approximately 95,000 (SMFD 2021). The per capita call volume is roughly .12 for the City of San Marcos. The Project plans for 60 employees to cover 16 hours of operation 5 days per week. As a conservative approach, this analysis assumes a population of 60 people on-site 16 hours per day and therefore, bases anticipated emergency calls on a 2/3rd day and 5/7th year timeframe since there would not be employees on site during the overnight hours (8 hours per day) or on weekends (104 days per year). Therefore, the annual calls generated by the site's population are calculated on an annual basis and then discounted to more accurately represent the part-time status.

A population of approximately 60 would generate approximately 7 calls per year if they were associated with a residential development. As a conservative approach, this analysis ignores the overnight depopulation and focuses on the absence of workers on weekends. Subtracting the 104 weekend days from 365 total days, there are people on site 261 days per year. This represents 72% of the year. Discounting the 7 calls per year generated from a full-time population by 28% results in a projected 5 calls per year, most of which are expected to be medical-related calls, consistent with typical emergency call statistics.

The closest SMFD fire station, Station 2 currently responds to roughly 17.8 calls per day (6,502 calls per year) in its primary service area. This is a busy fire station and adding calls can cumulatively create an impact and result in longer response times or stacked calls requiring assistance from more distant fire stations. It is anticipated that

the Project's contributions, along with other projects' contributions to fire service and availability fees through property taxes and/or other avenues provide funding needed to augment service capabilities such that an impact is not experienced. Despite the current busy call load, an addition of 5 calls per year, or 1 call every 2.5 months, is not expected to significantly impact service level requirements.

5 Discussion and findings

5.1 Emergency Response

As presented, Station 2 is well-within the City's time response goal for first-in fire engine and medic ambulance to the entire Project site.

5.2 Call Volume/Load

The Project would generate emergency calls, primarily medical, proportionally with its population and less than full-time on-site status. At build out, there may be as many as 0.014 calls per day generated by the on-site population. The addition of one call per 2.5 months to a station that is currently running approximately 17.8 calls per day is not considered a significant increase. Based on the information provided by SMFD, the Project's additional call volume should not cause a significant stress on the response capabilities. However, SMFD would make the final determination, based on specific fire station call volumes (which were not provided for this analysis), whether the station would incur delayed response times or an increase in call volume that could not be absorbed.

6 Recommendations

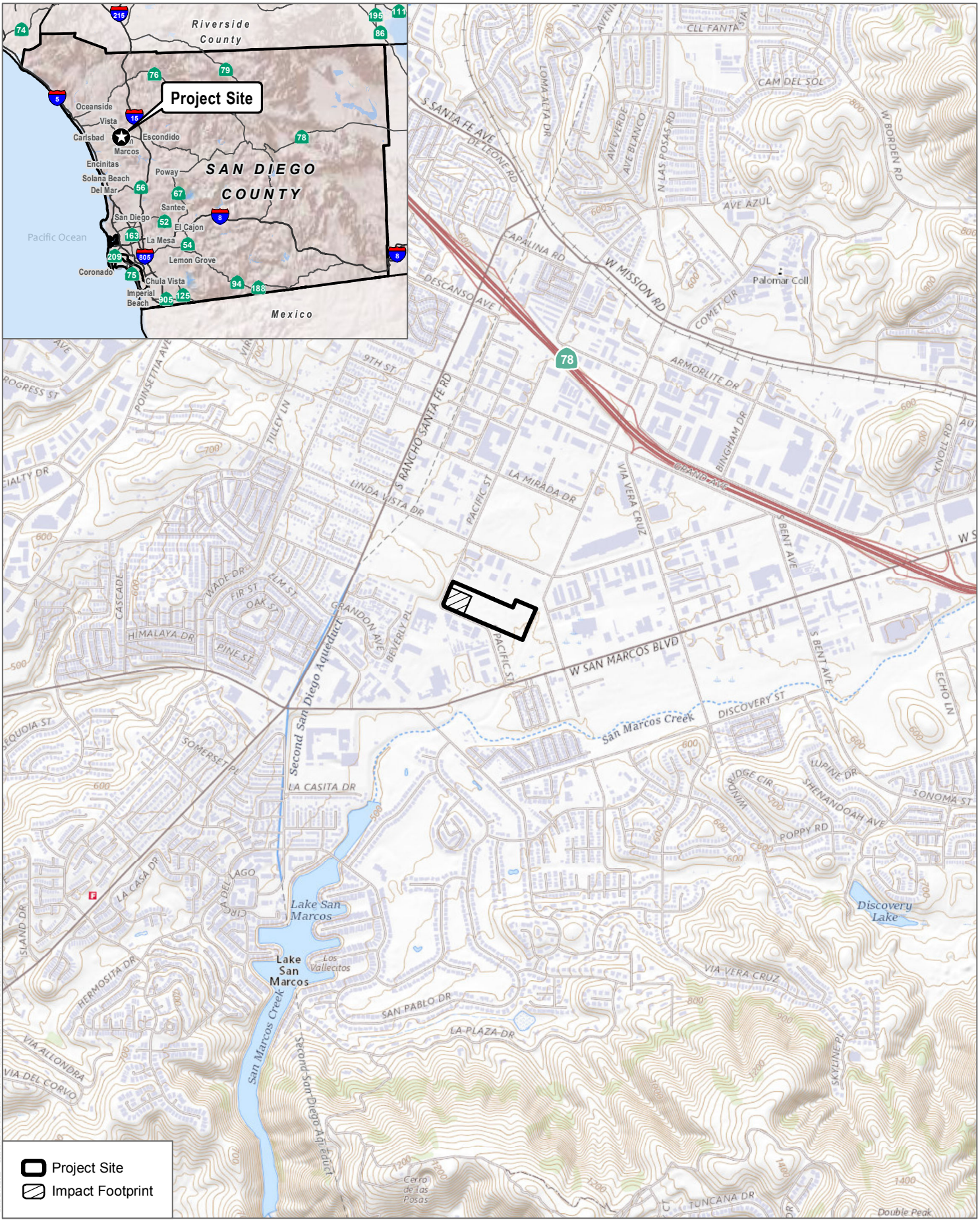
The following Recommendation is provided based on the preceding analysis:

It is recommended that SMFD provide emergency response to the proposed Project from Station 2. Factors supporting this recommendation are the absorbable number of calls that would be anticipated as the Project is built and the response time that is within range of local and national standards.

Please feel free to contact me if you have any questions or need any additional information. I look forward to continuing to work with you on this project's fire safety considerations.

Attachment 1

Project Location Exhibit



SOURCE: USGS 7.5-Minute Series San Marcos Quadrangle
Township 12S / Range 3W / Section 16

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0 1,000 2,000 Feet

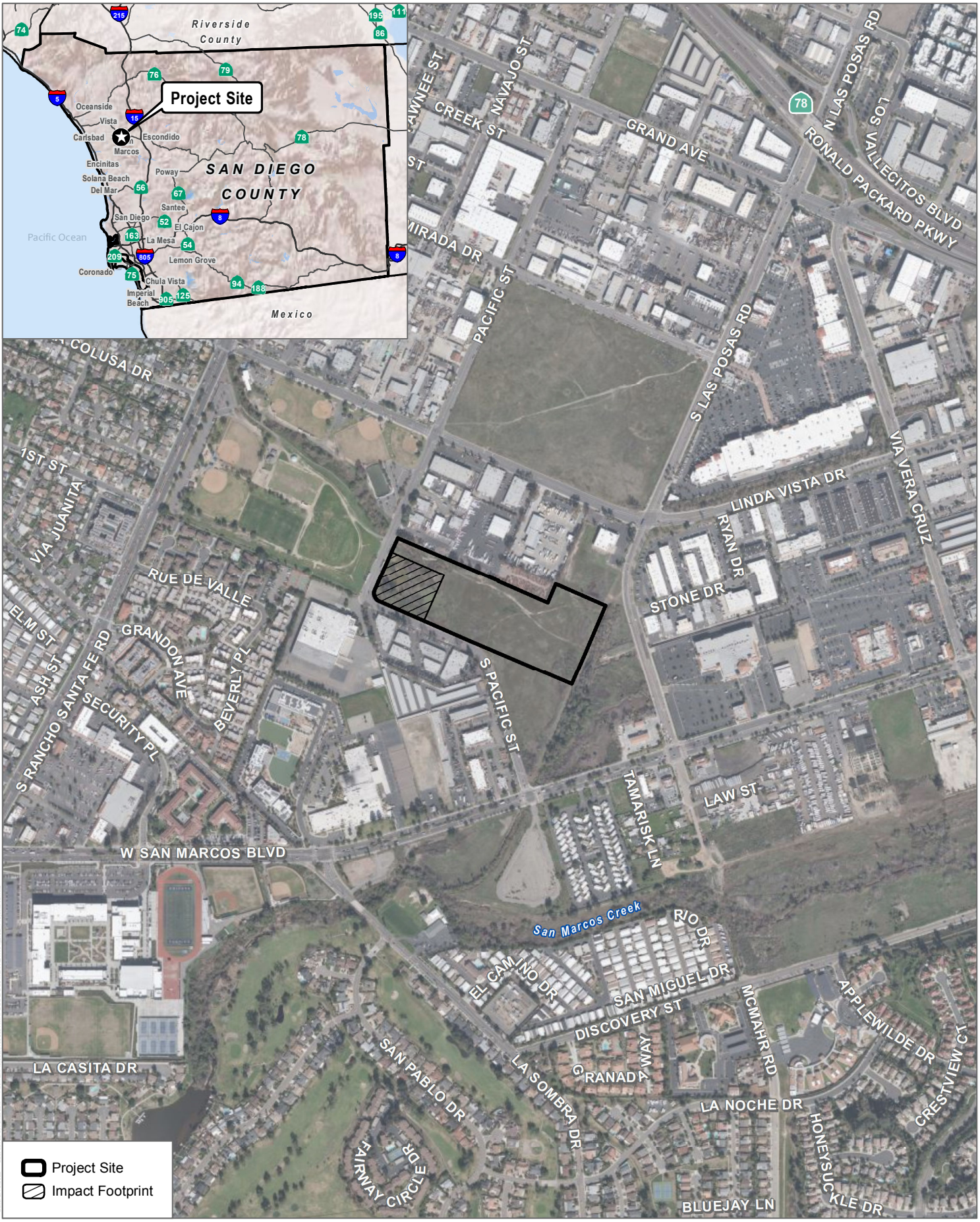
FIGURE 1

Project Location

Emergency Response Analysis for the Hughes Circuits Project

Attachment 2

Hughes Circuit Project Site



SOURCE: Bing Maps 2022

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0 400 800 Feet

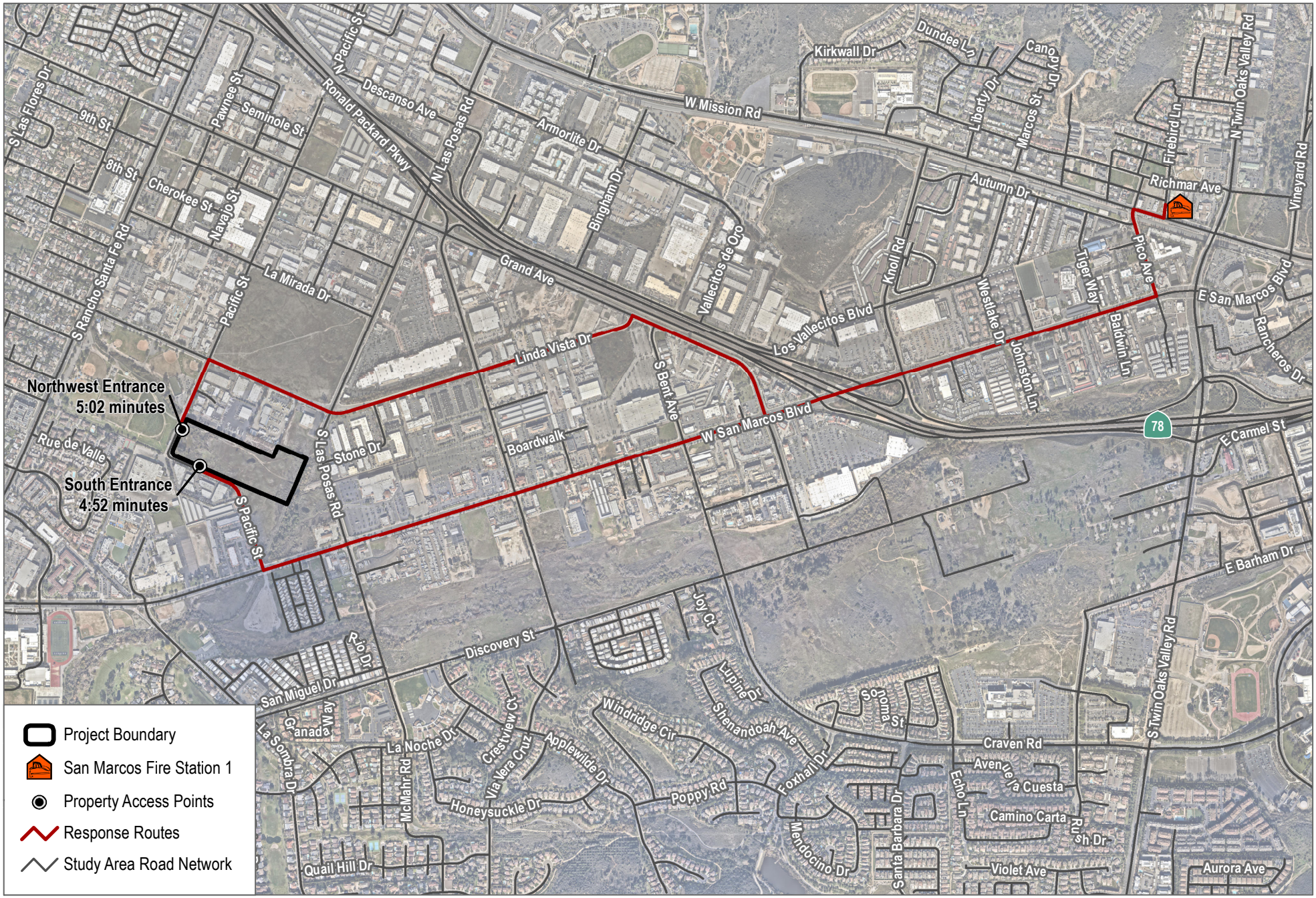
FIGURE 2

Project Site

Emergency Response Analysis for the Hughes Circuits Project

Attachment 3

Travel Time Response to Project from Existing San Marcos Fire Station 1



SOURCE: SanGIS 2019,

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0 700 1,400 Feet

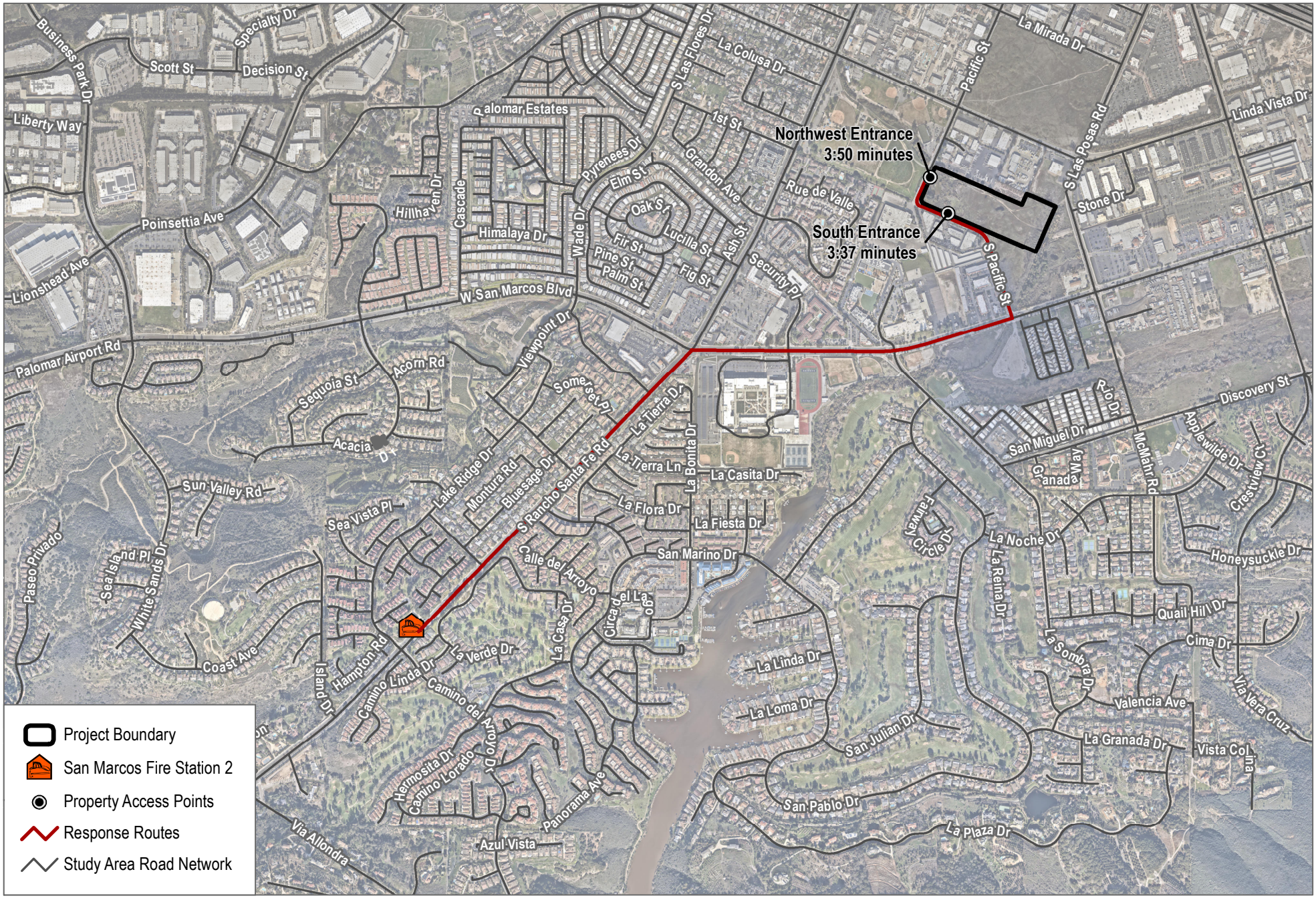
FIGURE 3

ISO Drive Times - San Marcos Fire Station 1

Hughes Circuits Project

Attachment 4

Travel Time Response to Project from Existing San Marcos Fire Station 2



SOURCE: SanGIS 2019

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0 700 1,400 Feet

FIGURE 4

ISO Drive Times - San Marcos Fire Station 2

Hughes Circuits Project