

A P P E N D I X I

F O C U S E D T R A F F I C S T U D Y







April 5, 2022

Ms. Sonia Urzua, AICP  
Alameda County Community Development Agency  
Planning Department  
224 West Winton Avenue, RM. 111  
Hayward, CA 94544-1215

## **Focused Traffic Study for the Mosaic Project**

Dear Ms. Urzua;

As requested, W-Trans has prepared a focused traffic analysis for the proposed Mosaic Project to be located at 17015 Cull Canyon Road in unincorporated Alameda County (Castro Valley). The purpose of this letter is to evaluate the project's potential traffic impacts, site access and adequacy of parking.

### **Existing Conditions**

The study area consists of Cull Canyon Road, which runs along the frontage of the project site. Cull Canyon Road generally runs north-south and is classified as a local road. Along the project frontage, the road has one ten-foot lane in each direction. The portion of Cull Canyon Road near the project site does not have sidewalks or bike lanes. Machine counts conducted on Cull Canyon Road on Friday, March 8, 2019, and Monday, March 11, 2019 indicate that the roadway is carrying an average of about 210 daily vehicles in both directions, for a total of 420 vehicles per day.

### **Site Description**

The existing site is comprised of a 1,200 square-foot home, 7,500 square-foot garage building, and 970 square-foot barn. The property is served by two driveways on Cull Canyon Road. A gravel parking area is located adjacent to the northern driveway. A gravel roadway connects the various structures on the site as well as the two driveways. Buses and other vehicles would enter the site via the northerly driveway and exit the site from the southerly driveway. Cull Creek runs through the property, generally parallel and west of Cull Canyon Road. An existing 12-foot-wide bridge spans Cull Canyon Creek and leads to a developed area which includes the garage building, paved patio, and driveways with drainage swales. The remainder of the site is steep bay and oak woodlands on an east-facing slope.

### **Project Description**

The proposed project consists of an outdoor program overnight camp for 4<sup>th</sup> and 5<sup>th</sup> grade students. Three classes of 4<sup>th</sup> or 5<sup>th</sup> grade students (85-100 students maximum) would be transported to the camp by bus from their schools for a five-day, four-night program in nature. Students are anticipated to arrive by bus at 11:30 a.m. Monday morning and depart at 1:30 p.m. Friday afternoon. The Mosaic Project currently operates a program seasonally during the school year with six-week camp sessions from September to October and from late April to June at a different location. The intent is to expand the program from its existing location to the new Cull Canyon site. During initial operation at the new Cull Canyon site the Outdoor Program would continue to operate under the same schedule as the existing program. However, the goal is to expand the program to operate year-round, with more sessions during the school year, thereby serving more students per year.

As proposed, the project would remove the existing garage and construct new structures to provide ten student cabins, two teacher cabins, one residential unit, and one restroom and shower building, and a multi-use building.

The existing home would be converted to a caretaker unit. The existing barn is proposed to remain in place. The proposed project site plan is enclosed.

Vehicles would park in the gravel area adjacent to the driveways. Students would disembark/board buses from the driveway area and walk across the bridge to the lodging area. Only staff service vehicles would use the bridge to access the multipurpose building and facilities on the east side of Cull Creek.

## Operational Analysis

Operating conditions along Cull Canyon Road on a typical Monday and Friday were evaluated to capture the highest potential impacts for the proposed project. The Monday period between 10:00 a.m. and 12:00 p.m. reflects conditions during bus drop-off and staff arrival, while the Friday period between 1:00 and 3:00 p.m. reflects bus pick-up and staff departure.

## Trip Generation

Trip generation estimates are typically developed using standard rates published by the Institute of Transportation Engineers (ITE) in the most recent edition of the *Trip Generation Manual*. However, standard rates are not applicable to the proposed project since the manual does not specify rates for overnight education or youth camps. Thus, the trip generation potential for the Monday drop-off and Friday pick-up hours was developed based on anticipated staffing, student participants, and teachers present for each weekly camp session.

During operational months of the Mosaic Project, 85 to 100 students are anticipated to attend camp each week. Two to three buses, and occasionally one or two vans/shuttles, will transport all students, teachers, and aids. Occasionally, one to two teachers or aids will travel by personal vehicle.

Mosaic Project staff are anticipated to spend the week while camp is in session living on-site, so would generate no additional trips during the week. It is assumed that staff who drive in a personal vehicle to camp would travel outside of the arrival and departure hours of the students as they would be on-site for set-up prior to student arrival and would remain to clean up and were therefore not included in the peak hour analysis.

The *Highway Capacity Manual* (2010) stipulates that all truck trips shall be converted into passenger car equivalents (PCE) for analyzing capacity. For rolling terrain, one truck or bus should be converted to 2.5 PCE. Applying this equivalency conversion to the three proposed buses would equate to 8 PCE.

During the analysis periods of Monday 10:00 a.m. to 12:00 p.m. and Friday 1:00 p.m. to 3:00 p.m., the site would generate round trips by three buses and two vans as well as either two inbound or two outbound trips by private vehicle. After translating the bus trips to equivalent passenger car trips, the proposed project is anticipated to generate an average of 22 trips on Monday during the drop-off period and Friday during the pick-up period; these new trips represent the increase in traffic associated with the project.

Additionally, one to two deliveries of food and supplies are anticipated throughout the week during the operational months of the camp. These deliveries would occur during off-peak times and as part of a normal delivery route for the supplier, so these trips were not included in the peak hour analysis. Project trips are summarized in Table 1.

**Table 1 – Trip Generation Summary**

Persons	Transportation	Maximum Daily Trips	Monday Drop-Off			Friday Pick-Up		
			Trips	In	Out	Trips	In	Out
Students	3 Buses	16*	16	8	8	16	8	8
Students	2 Vans/Shuttles	4	4	2	2	4	2	2
Teachers/Aids	2 Private Vehicles	2	2	2	0	2	0	2
Mosaic Staff**	12 Private Vehicles	24	0	0	0	0	0	0
Delivery**	1 Truck	5**	0	0	0	0	0	0
<b>Total</b>		<b>51</b>	<b>22</b>	<b>12</b>	<b>10</b>	<b>22</b>	<b>10</b>	<b>12</b>

Notes: \* 1 truck/bus = 2.5 PCE's (Passenger Car Equivalents); \*\* All staff trips and deliveries were assumed to occur outside peak hour for student arrivals

The project site is expected to generate a peak of 51 daily trips, which is only anticipated to occur on a Monday or Friday. On weekends and Tuesday, Wednesday, and Thursday, less than 10 daily trips are expected.

**Recommendation** – It is recommended that truck deliveries be scheduled to occur on Tuesday, Wednesday or Thursdays to avoid conflicts with student arrival or departure.

### Trip Distribution

The trip distribution was assumed to be 100 percent to/from Cull Canyon Road south of the site. Cull Canyon Road terminates about 3.5 miles north of the project site, and there is limited potential for the project to generate trips to/from the north.

### Roadway TIRE Index

The average daily traffic (ADT) volume on Cull Canyon Road near the project site was determined based on machine counts conducted on Friday, March 8 and Monday, March 11, 2019. The volumes used for the analysis represent the average of the two-day count. Roadway segment counts are enclosed.

The potential effect of adding project-related traffic on residential streets near the project site was evaluated based on the Traffic Infusion on Residential Environment (TIRE) index. The TIRE index is a tool that measures the residents' perception of the effect of increasing the ADT on residential streets. TIRE index values range from 0.0 to 5.0 depending on daily traffic volume. An index of 0.0 represents the least infusion of traffic and 5.0 the greatest, and thereby the poorest residential environment. A TIRE index of 3.0 represents the threshold at which the character of a residential street changes. Residential streets with a TIRE index above this mid-range point of 3.0 typically exhibit higher traffic volumes, while streets with a TIRE index below 3.0 are usually more suitable for residential activities. According to this methodology, an impact occurs on the residential street when the difference in index between no project and project conditions is 0.10 or more.

It is estimated that 100 percent of the project-generated traffic would access the project via Cull Canyon Road. This represents 51 trips per day. To change the TIRE index calculation by 0.1 (or greater), 94 daily trips would be necessary. The number of daily trips needed is much higher than the 51 project-generated trips that are anticipated to use Cull Canyon Road.

**Finding** – The increase of daily traffic on Cull Canyon Road is insufficient to increase the TIRE index by 0.1. Thus, the addition of these trips would result in a less-than-significant impact.

## Collision History

The collision history for the study area was reviewed to determine any trends or patterns that may indicate a safety issue. Based on records available from the California Highway Patrol as published in their Statewide Integrated Traffic Records System (SWITRS) reports, no collisions were reported in the project vicinity from January 1, 2012 through December 31, 2017. Two run-off-the-road collisions occurred during the same time period approximately one mile south of the project site.

## Pedestrian Facilities

Given the remoteness of the proposed project site, it is reasonable to assume that all visitors will travel to and from the site by private automobile or bus. Therefore, the project is not anticipated to generate pedestrian traffic.

**Finding** – Although there are no pedestrian facilities serving the site, pedestrian trips are not expected.

## Bicycle Facilities

Within the study area, bicyclists ride in the roadway on Cull Canyon Road. Existing roadway shoulders do not provide adequate access for bicyclists. The *Alameda County Bicycle and Pedestrian Plan for Unincorporated Areas* published in April 2012 does not specify or recommend any future bike lanes in the project vicinity. Visitors are not anticipated to travel to the project site by bicycle.

**Finding** – Shared use of local streets near the project site will provide adequate access for bicyclists, since visitors are not anticipated to arrive by bicycle.

## Transit Facilities

There are no transit facilities serving the site; however, given the nature of the project, no demand is anticipated for the project. Schools sending students to the camp provide bus transportation for students and teachers.

**Finding** – Although transit facilities do not serve the project site, none are expected to be needed as visitors will arrive solely by a private vehicle (bus or automobile).

## Access Analysis

Buses and other vehicles are expected to enter the site via the northerly driveway and exit the site from the southerly driveway. The two driveways are located approximately 240 feet apart on Cull Canyon Road. Vehicles would park on-site in the gravel area adjacent to these driveways.

## Sight Distance

Sight distances along Cull Canyon Road at the project driveways were evaluated based on sight distance criteria contained in the *Highway Design Manual* published by Caltrans. The recommended sight distance at minor street approaches that are a driveway is based on stopping sight distance, which uses the approach travel speeds as the basis for determining the recommended sight distance.

Sight distance at the proposed driveways were field measured as well as reviewed on available online aerial photographs. At the northerly driveway, the clear sight distance is about 420 feet to the north and 460 feet to the south, which is adequate for speeds up to 45 miles per hour and 50 miles per hour, respectively. At the southerly driveway sight lines are about 315 feet to the north and 240 feet to the south, which is adequate for speeds up to

40 miles per hour and 30 miles per hour, respectively. Based on the posted speed limit of 30 miles per hour, the sight distances at both the northerly and southerly driveways are adequate.

**Finding** – Sight distances for both project driveways are expected to be adequate based on existing conditions.

### **Site Circulation**

On-site circulation was evaluated to determine if the layout would provide adequate circulation and room for vehicles maneuvering through the property. Based on a review of the site plan, the internal drive aisles are expected to provide acceptable circulation for motorized vehicles.

School bus and fire truck turning template analyses were conducted to evaluate whether a 38-foot-long school bus and a 31-foot-long fire truck would be able to enter, maneuver within and exit the site. The enclosed exhibits demonstrate that a school bus and fire truck would have sufficient space to enter from the northerly driveway, maneuver within the project site, and exit from the southerly driveway without striking any permanent fixtures.

**Finding** – School bus and fire truck access would be adequate since they would be able to enter, exit, and maneuver through the site.

### **Left-Turn Lane Warrant**

The need for a left-turn lane on Cull Canyon Road at the project driveway was evaluated based on criteria contained in the *Intersection Channelization Design Guide*, National Cooperative Highway Research Program (NCHRP) Report No. 279, Transportation Research Board, 1985, as well as an update of the methodology developed by the Washington State Department of Transportation and published in the *Method For Prioritizing Intersection Improvements*, January 1997. The NCHRP report references a methodology developed by M. D. Harmelink that includes equations that can be applied to expected or actual traffic volumes to determine the need for a left-turn pocket based on safety issues.

Under existing conditions with the additional of project-related trips, a left-turn lane is not warranted on Cull Canyon Road at the project driveway during Monday drop-off or Friday pick-up.

### **Parking**

The project would provide a maximum of ten parking spaces at various locations around the site.

The project was analyzed to determine whether the proposed parking supply would be sufficient for the anticipated parking demand. The maximum number of parking spaces needed on-site would be during the mid-week period, after student drop-off and prior to student pick-up, and does not include the buses or vans that would drop students and staff off and then leave the site. During this time, there would typically be 12 Mosaic Staff on site. Assuming one employee per vehicle, in addition to the two teacher and aid private automobiles, the estimated parking demand would be 14 spaces. The proposed parking supply would have a deficit of four spaces.

If parking demand exceeds parking supply, motorists would be anticipated to park on the shoulder of Cull Canyon Road or park in tandem with other vehicles on-site. Parking on the shoulder of Cull Canyon Road would be expected to limit sight distance, posing a safety issue. Tandem parking could limit circulation and obstruct emergency vehicle access.

The project site plan does not propose any accessible parking spaces. The *ADA Standards for Accessible Design* (2010) sets forth requirements for the minimum number of accessible parking spaces based on the total number of parking spaces provided. For parking facilities with 25 or less parking spaces, one van accessible parking space is required.

**Finding** –The proposed parking supply for the project would not accommodate the anticipated mid-week parking demand or comply with ADA standards.

**Recommendation** – It is recommended that the site plan be modified to accommodate 13 parking spaces plus one van accessible parking space, for a total of 14 parking spaces.

## Vehicle Miles Traveled (VMT) Evaluation

Senate Bill (SB) 743 established the increase in Vehicle Miles Traveled (VMT) because of a project as the basis for determining transportation impacts of development projects. As of the date of this analysis, Alameda County has not yet established thresholds of significance related to VMT. Thus, the project-related VMT impacts were assessed based on guidance provided by the California Governor’s Office of Planning and Research (OPR) in the publication *Transportation Impacts (SB 743) CEQA Guidelines Update and Technical Advisory*, 2018. Guidance provided in this document recommends the use of screening thresholds to quickly identify when a project should be expected to cause a less-than-significant impact in terms of VMT without conducting a detailed study. This document indicates that small projects that generate or attract fewer than 110 trips per day may be assumed to cause a less-than-significant transportation impact.

The proposed project is expected to generate 51 daily trips which satisfies OPR’s guidance for consideration as a small project. As a small project, the impact on vehicle miles traveled can be assumed to be less-than-significant.

**Finding** – The proposed project is anticipated to result in a less-than-significant impact on vehicle miles traveled.

## Conclusions and Recommendations

- The proposed project is anticipated to generate an average of the equivalent of 22 peak hour trips (considering buses as equivalent to 2.5 cars) on Monday during the drop-off period and Friday during the pick-up period. At maximum (Mondays and Fridays only), the project is anticipated to generate the equivalent of 51 daily trips. Truck deliveries should be scheduled during midweek to avoid conflicts with drop-off and pick-up activities.
- Per the TIRE index, the addition of project-related trips on Cull Canyon Road is expected to result in a less-than-significant impact.
- Pedestrian, bicycle, and transit facilities are not provided. However, these facilities are deemed unnecessary for the site because visitors and staff are expected to travel by bus and private automobile.
- Sight distance to the north and south of both driveways would be adequate based on the posted speed limit of 30 miles per hour. A left-turn lane at the project driveway is not warranted.
- Maneuverability throughout the site is adequate for school bus drop-off and pick-up, as well as fire truck access.
- The site should provide 14 parking spaces, including one van accessible space, to accommodate demand.
- The proposed project would have a less-than-significant transportation impact on vehicle miles traveled.

We hope this information is adequate to address the potential traffic and parking impacts associated with the proposed project. Thank you for giving W-Trans the opportunity to provide these services. Please call if you have any questions.

Sincerely,



Kenneth Jeong, PE  
Senior Traffic Engineer



Mark Spencer, PE  
Senior Principal

MES/kbj/ALX035.L1



Enclosures: Site Plan, Roadway Segment Counts, Site Circulation Diagrams

**LEGEND**

- EXISTING TREE
- PROPOSED FIRE HYDRANT
- EXISTING FIRE HYDRANT
- EXISTING WELL
- EXISTING EASEMENT
- EXISTING PROPERTY LINE
- EXISTING TOP OF BANK
- EXISTING TOE OF BANK
- EXISTING ROADWAY
- EXISTING BUILDING
- CONTIGUOUS DEVELOPMENT ENVELOPE
- PROPOSED 25' SETBACK
- PROPOSED 50' SETBACK
- PROPOSED 100' SETBACK
- PROPOSED 150' SETBACK
- PROPOSED WATER
- PROPOSED ROADWAY
- PROPOSED AC PAVING
- PROPOSED CONCRETE
- PROPOSED PEROUVIOUS PAVING
- PROPOSED VEGETATIVE STRIP

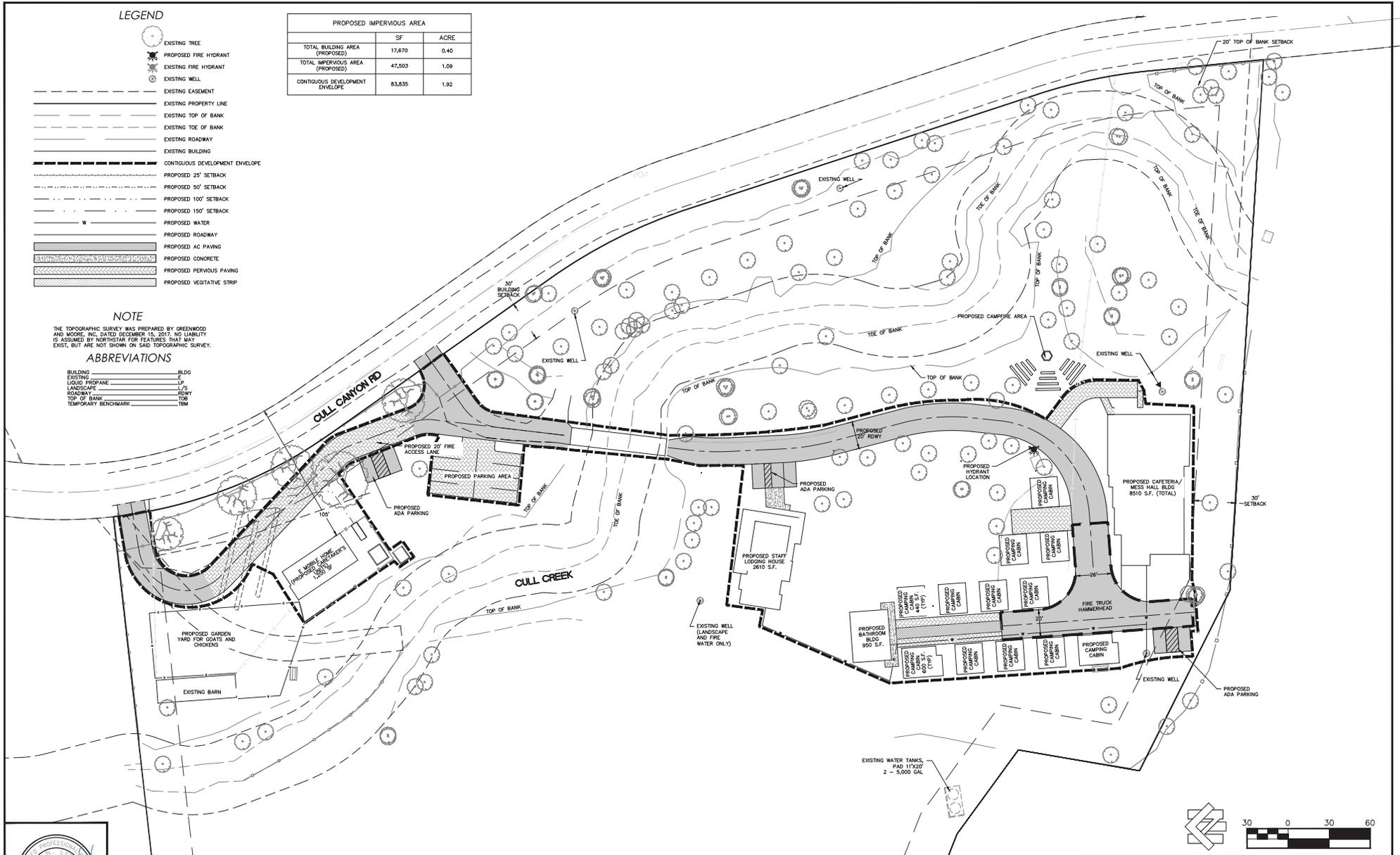
PROPOSED IMPERVIOUS AREA		
	SF	ACRE
TOTAL BUILDING AREA (PROPOSED)	17,670	0.40
TOTAL IMPERVIOUS AREA (PROPOSED)	47,503	1.09
CONTIGUOUS DEVELOPMENT ENVELOPE	83,835	1.92

**NOTE**

THE TOPOGRAPHIC SURVEY WAS PREPARED BY GREENWOOD AND MOORE, INC. DATED DECEMBER 15, 2011. NO LIABILITY IS ASSUMED BY NORTHSTAR FOR FEATURES THAT MAY EXIST, BUT ARE NOT SHOWN ON SAID TOPOGRAPHIC SURVEY.

**ABBREVIATIONS**

- BUILDING \_\_\_\_\_ BLDG
- EXISTING \_\_\_\_\_ EX
- LIQUID PROPANE \_\_\_\_\_ LP
- LANDSCAPE \_\_\_\_\_ L/S
- ROADWAY \_\_\_\_\_ RDWY
- TOP OF BANK \_\_\_\_\_ TOB
- TEMPORARY BENCHMARK \_\_\_\_\_ TBM



Designed	DJW	Revision		Date	By
Drawn By	CNS				
Approved					
Date	JULY 2019				

**NORTHSTAR**  
— Designing Solutions —

111 WILSON STREET | SUITE 100 | CASTRO VALLEY, CA 94546  
PHONE: (925) 555-1234 | WWW.NORTHSTAR-CA.COM

**MOSAIC**  
17015 CULL CANYON  
CASTRO VALLEY, CALIFORNIA 94546

PROPOSED SITE LAYOUT				
MOSAIC				
APN Number	Job Number	Scale	N/A	Sheet 2 Of 3
085-1200-001-16	17-231	1" = 30'	Vert.	



## Volume Report Summary

---

**Location:** Cull Canyon Rd S/O 17031 Cull Canyon Rd  
**Count Direction:** Northbound / Southbound  
**Date Range:** 3/8/2019 - 3/14/2019  
**Site Code:** 01

### Volume Summary

	<b>NB</b>	<b>SB</b>	<b>Total</b>
Daily Average	209	210	419
Mid-Week Average	#DIV/0!	#DIV/0!	#DIV/0!
AM Peak Average			
PM Peak Average			

Location:  
 Count Date:  
 Site Code:

Cull Canyon Rd S/O 17031 Cull Canyon Rd  
 3/8/2019  
 01

Time	NB	SB	Total
12:00 AM	1	0	1
1:00 AM	0	0	0
2:00 AM	1	2	3
3:00 AM	0	0	0
4:00 AM	1	0	1
5:00 AM	3	1	4
6:00 AM	2	5	7
7:00 AM	8	16	24
8:00 AM	11	14	25
9:00 AM	7	12	19
10:00 AM	9	16	25
11:00 AM	10	10	20
12:00 PM	19	15	34
1:00 PM	14	13	27
2:00 PM	19	15	34
3:00 PM	21	16	37
4:00 PM	12	17	29
5:00 PM	16	18	34
6:00 PM	13	14	27
7:00 PM	10	13	23
8:00 PM	9	2	11
9:00 PM	7	3	10
10:00 PM	7	2	9
11:00 PM	0	0	0
<b>Daily Total</b>	<b>200</b>	<b>204</b>	<b>404</b>
<b>Percent</b>	<b>50%</b>	<b>50%</b>	
<b>AM Peak Hour (8:00 AM - 9:00 AM)</b>	<b>11</b>	<b>14</b>	<b>25</b>
<b>Percent</b>	<b>44%</b>	<b>56%</b>	
<b>PM Peak Hour (3:00 PM - 4:00 PM)</b>	<b>21</b>	<b>16</b>	<b>37</b>
<b>Percent</b>	<b>57%</b>	<b>43%</b>	

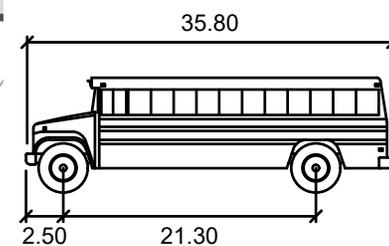
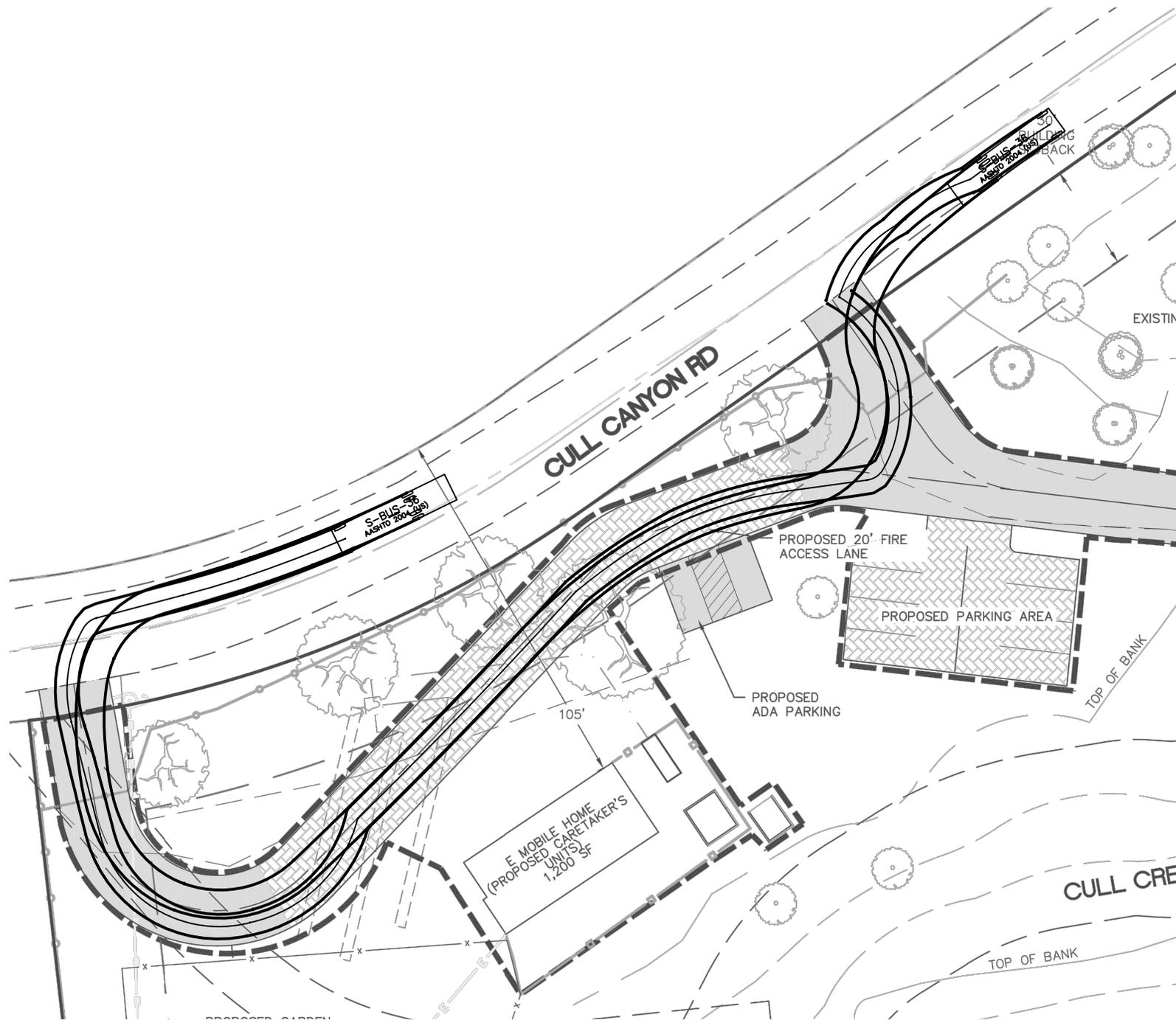
Note: Peak Hour Based on hourly time of day bins.

Location:  
 Count Date:  
 Site Code:

Cull Canyon Rd S/O 17031 Cull Canyon Rd  
 3/11/2019  
 01

Time	NB	SB	Total
12:00 AM	3	0	3
1:00 AM	1	1	2
2:00 AM	0	0	0
3:00 AM	0	0	0
4:00 AM	0	0	0
5:00 AM	2	3	5
6:00 AM	2	3	5
7:00 AM	8	16	24
8:00 AM	8	14	22
9:00 AM	6	13	19
10:00 AM	12	10	22
11:00 AM	12	13	25
12:00 PM	10	18	28
1:00 PM	27	15	42
2:00 PM	15	18	33
3:00 PM	20	12	32
4:00 PM	25	11	36
5:00 PM	15	25	40
6:00 PM	21	14	35
7:00 PM	4	16	20
8:00 PM	11	7	18
9:00 PM	6	1	7
10:00 PM	5	2	7
11:00 PM	5	3	8
<b>Daily Total</b>	<b>218</b>	<b>215</b>	<b>433</b>
<b>Percent</b>	<b>50%</b>	<b>50%</b>	
<b>AM Peak Hour (10:00 AM - 11:00 AM)</b>	<b>12</b>	<b>13</b>	<b>25</b>
<b>Percent</b>	<b>48%</b>	<b>52%</b>	
<b>PM Peak Hour (1:00 PM - 2:00 PM)</b>	<b>27</b>	<b>15</b>	<b>42</b>
<b>Percent</b>	<b>64%</b>	<b>36%</b>	

Note: Peak Hour Based on hourly time of day bins.

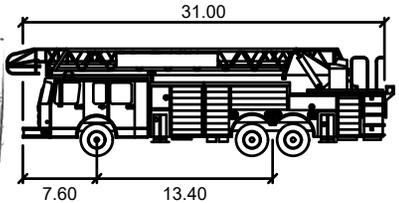
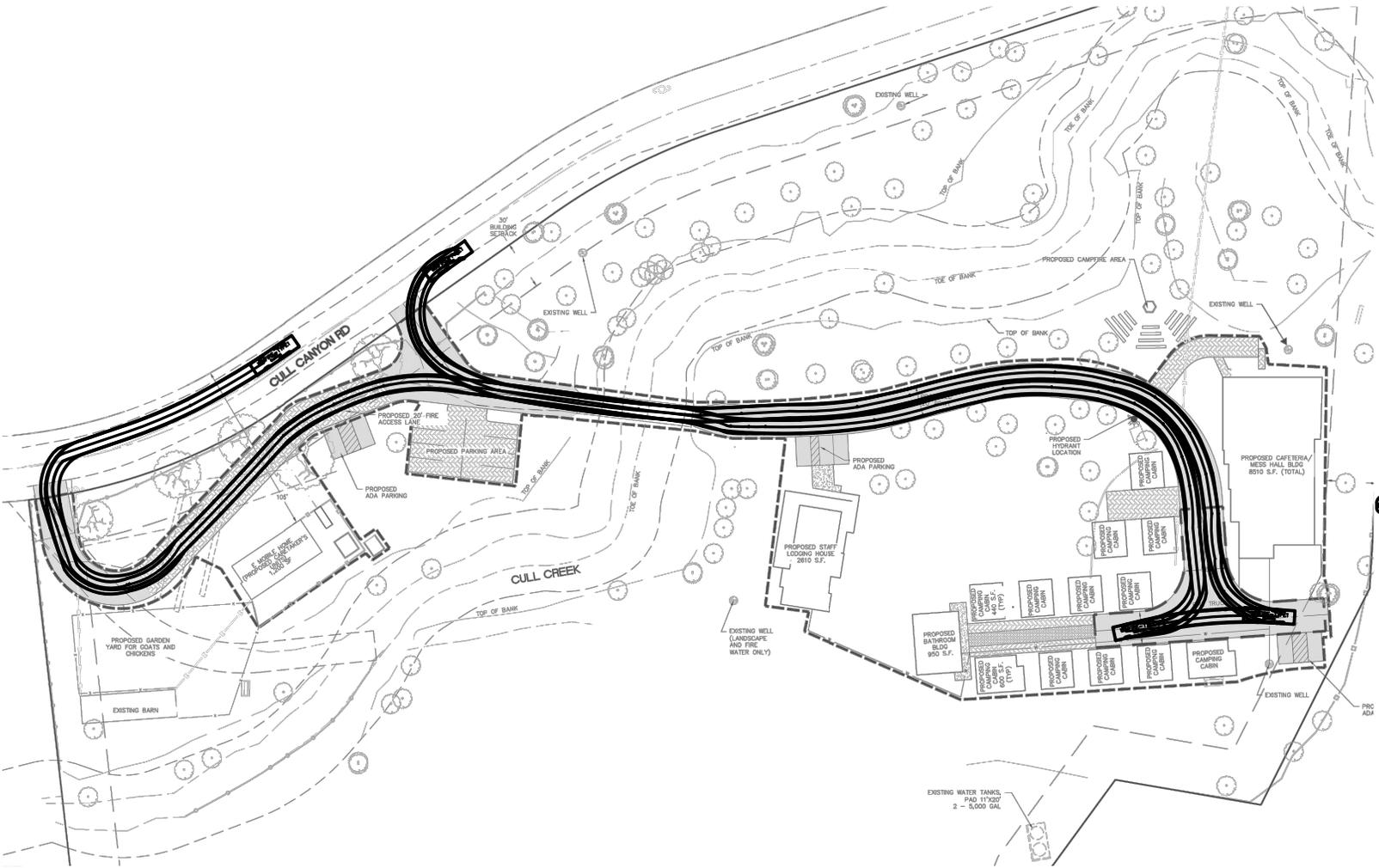


S-BUS-36

	feet
Width	: 8.00
Track	: 8.00
Lock to Lock Time	: 6.0
Steering Angle	: 37.6



SCALE: 1"=40'



WINFIRE-TYPE 1

	feet
Width	: 8.20
Track	: 8.20
Lock to Lock Time	: 6.0
Steering Angle	: 26.4



SCALE: 1"=100'

