Appendix D

Traffic Study

Penfield & Smith

111 East Victoria Street
Santa Barbara, CA 93101

tel 805-963-9532
fax 805-966-9801

www.penfieldsmith.com

Santa Barbara
Camarillo
Santa Maria
Lancaster

Civil Engineering

Land Surveying

Land Use Planning

Construction
Management & Inspection

Traffic & Transportation
Engineering

Transportation Planning

18113.01

July 10, 2008

Mr. Michael Ip, PE
Boyle Engineering Corporation
5851 Thille Street, Suite 201
Ventura, CA 93003

Subject: Preliminary Traffic Analysis, California State University Channel Islands Campus Entrance Road Project, CSUCI Project No. CI-45

Dear Mr. Ip:

Penfield & Smith (P&S) has prepared the following preliminary traffic analysis for the proposed Cal State University, Channel Islands (CSUCI) Campus Entrance Road based on the land uses and student population proposed in the 2000 Campus Master Plan Environmental Impact Report (EIR)[1]. Additional project information was obtained from this report and is incorporated by reference.

The following analysis summarizes the proposed project land uses, roadways, and parking, presents the project trip generation and distribution and evaluates the potential traffic conditions on the proposed Entrance Road and surrounding intersections.

Project Description

The CSUCI campus is located in southern Ventura County, approximately 1.5 miles south of the City of Camarillo and northeast of the intersection of Lewis and Potrero Roads. Primary access to the campus is provided via Lewis Road (State Route 34) from the north and south. Regional access is provided by U.S. Highway 101 to the north and Hueneme Road and State Route 1 from the southwest.

Proposed Land Uses

The Campus Master Plan includes a variety of facilities related to the University and its academic programs. Specifically, the 2000 Campus Master Plan EIR evaluated a project with 11,750 full time equivalent (FTE) students at the campus, 900 dwelling units, a K-8 school with 600 students,

1. California State University, Channel Islands Final Supplemental Environmental Impact Report, Revised Campus Plan Master Plan, Rincon Consultants, June 5, 2000.

and 350,000 square feet of research and development space. These land uses have been used to evaluate the proposed Entrance Road as part of this study.

Proposed Roadways

The proposed Campus Entrance Road would provide primary access from the realigned Lewis Road to the Academic Core of the campus. The road is proposed as a divided roadway, separated by a 20-foot wide median, with curbs and gutters provide on each side of the road. Approximately halfway between Lewis Road and the Academic Core, the primary access road would intersect with a future secondary road intended to serve the West Campus.

The West Campus arterial will be a two-lane road with median. As provided in the 2000 Master Plan, an extension of Santa Barbara Avenue would extend parallel to Long Grade Canyon channel and connect with the new West Campus arterial. Both the primary access road and the West Campus arterial would require a new crossing of Long Grade Canyon channel. The new access road would also require a new bridge crossing over Calleguas Creek to connect with the realigned Lewis Road.

Proposed Parking Lots

In addition to the new Entrance Road and West Campus arterial, a new surface parking lot (West Parking Lot) is proposed south of the Entrance Road, east of the West Campus arterial and north of the Long Grade Canyon channel. Additional surface parking is proposed on the northeast side of the Entrance Road (East Parking Lot). P&S is currently completing the schematic design of the parking lots.

Project Trip Generation

In order to determine the amount of traffic that would be generated on the new Entrance Road, P&S reviewed the project trip generation rates from the 2000 Campus Master Plan EIR. The project trip generation rates from this report are presented in Table 1.

Table 1
Project Trip Generation Rates

Land Use	ADT Rate	A.M. Peak Rate			P.M. Peak Rate		
		In	Out	Total	In	Out	Total
University	2.38	0.1680	0.0420	0.21	0.0630	0.1470	0.21
Single Family Housing	9.57	0.1875	0.5625	0.75	0.6363	0.3737	1.01
Apartments	6.72	0.1020	0.4080	0.51	0.4030	0.2170	0.62
Condominiums-Townhouses	5.86	0.0748	0.3652	0.44	0.3484	0.1716	0.52
School	1.29	0.2310	0.1890	0.42	NA	NA	NA
R&D	8.11	1.0292	0.2108	1.24	0.1620	0.9180	1.08

Based on the trip generation rates presented in Table 1, the project is estimated to generate 33,932 average daily trips, 3,205 AM peak hour trips and 3,045 PM peak hour trips. The project trip generation is summarized in Table 2.

Table 2
Project Trip Generation

Land Use	Size	ADT Trips	A.M. Peak Trips			P.M. Peak Trips		
			In	Out	Total	In	Out	Total
University	11,750	27,965	1,974	494	2,468	740	1,727	2,468
Subtotal		27,965	1,974	494	2,468	740	1,727	2,468
Mixed Use/Internal[a]		-1,939			-212			-195
Total Academic		26,026	1,804	451	2,256	682	1,591	2,273
Single Family Housing	175	1,675	33	98	131	111	65	177
Apartments	360	2,419	37	147	184	145	78	223
Condominiums-Townhouses	365	2,139	27	133	161	127	63	190
School	600	774	139	113	252	0	0	0
R&D	350,000	2,839	360	74	434	57	321	378
Subtotal		9,845	596	566	1,161	440	527	968
Mixed Use/Internal*		-1,939			-212			-195
Total Non-Academic		7,906	487	463	949	352	421	773
Total External Trips		**33,932**	**2,291**	**914**	**3,205**	**1,033**	**2,012**	**3,045**

a. Mixed Use/Internal trips taken from 2000 Campus Master Plan EIR. Calculations not provided.

Project Trip Distribution

The 2000 Campus Master Plan EIR provides assumptions on where the project-added traffic will be coming from and going to within the campus road network. The traffic was broken down by "Academic" related trips and Non-Academic" related trips. In general, the project traffic was distributed as follows.

Table 3
Project Trip Distribution[a]

Roadway	Percent of Academic Traffic	Percent of Non-Academic Traffic
New Entry Road	70%	30%
Camarillo Dr. (Existing Access)	30%	70%

a. Trip Distribution assumptions obtained from 2000 Campus Master Plan EIR.

As part of this analysis, P&S made additional assumptions regarding the distribution of incoming/outgoing traffic at the proposed parking lot driveways. The trip distribution percentages are presented in Exhibit 1.

Project Impact Analysis

Based on the trip distribution percentages presented in Table 3 and illustrated on Exhibit 1, the project traffic was distributed on the proposed road network. The project-added volumes are presented in Exhibit 2.

As shown below, the project is estimated to add 20,590 average daily trips, 1,864 AM peak hour trips, and 1,240 PM peak hour trips to the proposed Entrance Road. As proposed, the Entrance Road is anticipated to have sufficient capacity to support the projected daily traffic at Buildout of the Campus Master Plan.

Table 4
Project Volumes on New Entry Road

ADT	A.M. Peak			P.M. Peak		
	In	Out	Total	In	Out	Total
20,590	1,409	455	1,864	583	1,240	1,823

Additionally, eight intersections located along the proposed Entrance Road and West Campus arterial road were evaluated with the project-added traffic for the AM and PM peak hours. To identify the operating condition at the study intersections, a level of service (LOS) ranking scale was used. This scale identifies impacts of traffic volumes versus roadway capacity and assigns a letter value to this relationship. The letter scale ranges from A to F with LOS A representing free flow conditions and LOS F representing congested conditions. The intersection levels of service were calculated using the Highway Capacity Software (HCS-2000) and are based on the delay of the worst minor approach. The level of service criteria is summarized in Table 5.

Table 5
Intersection Level of Service Criteria[2]

LOS	Unsignalized Intersections (Sec. of delay)	Definition
A	≤ 10	Conditions of free unobstructed flow, no delays and all signal phases sufficient in duration to clear all approaching vehicles.
B	> 10 and ≤ 15	Conditions of stable flow, very little delay, a few phases are unable to handle all approaching vehicles.
C	> 15 and ≤ 25	Conditions of stable flow, delays are low to moderate, full use of peak direction signal phases is experienced.
D	> 25 and ≤ 35	Conditions approaching unstable flow, delays are moderate to heavy, significant signal time deficiencies are experienced for short durations during the peak traffic period.
E	> 35 and ≤ 50	Conditions of unstable flow, delays are significant, signal phase timing is generally insufficient, congestion exists for extended duration throughout the peak period.
F	> 50	Conditions of forced flow, travel speeds are low and volumes are well above capacity. This condition is often caused when vehicles released by an upstream signal are unable to proceed because of back-ups from a downstream signal

2. Highway Capacity Manual, HCM2000, Transportation Research Board, Washington D.C.

The results of the LOS calculations are presented in Table 6. As shown below, two of the study intersections are forecast to operate at LOS D during the morning peak hour and one intersection is forecast to operate at LOS D during the afternoon peak hour with the project-added traffic. It should be noted that the level of service calculations represent the delay of the worst minor approach. Seven of the eight intersections, operate at LOS A to LOS C overall, during both peak hours. The exception is Intersection #7, which operates at an overall LOS D during the morning peak hour.

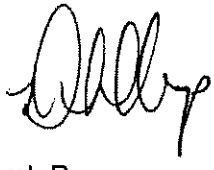
Table 6
Projected Level of Service – Worst Minor Approach

Intersection[a]	Traffic Control	AM Peak Hour LOS	PM Peak Hour LOS
1.	One-Way Stop	8.6/LOS A	9.1/LOS A
2.	Two-Way Stop	**26.9/LOS D**	16.5/LOS C
3.	Two-Way Stop	14.7/LOS B	12.8/LOS B
4.	Two-Way Stop	13.2/LOS B	**26.4/LOS D**
5.	Two-Way Stop	11.0/LOS B	17.3/LOS C
6.	One-Way Stop	13.8/LOS B	21.9/LOS C
7.	Two-Way Stop	**32.7/LOS D**	21.4/LOS C
8.	One-Way Stop	9.5/LOS A	9.2/LOS A

a. Refer to Exhibit 2 for intersection locations.

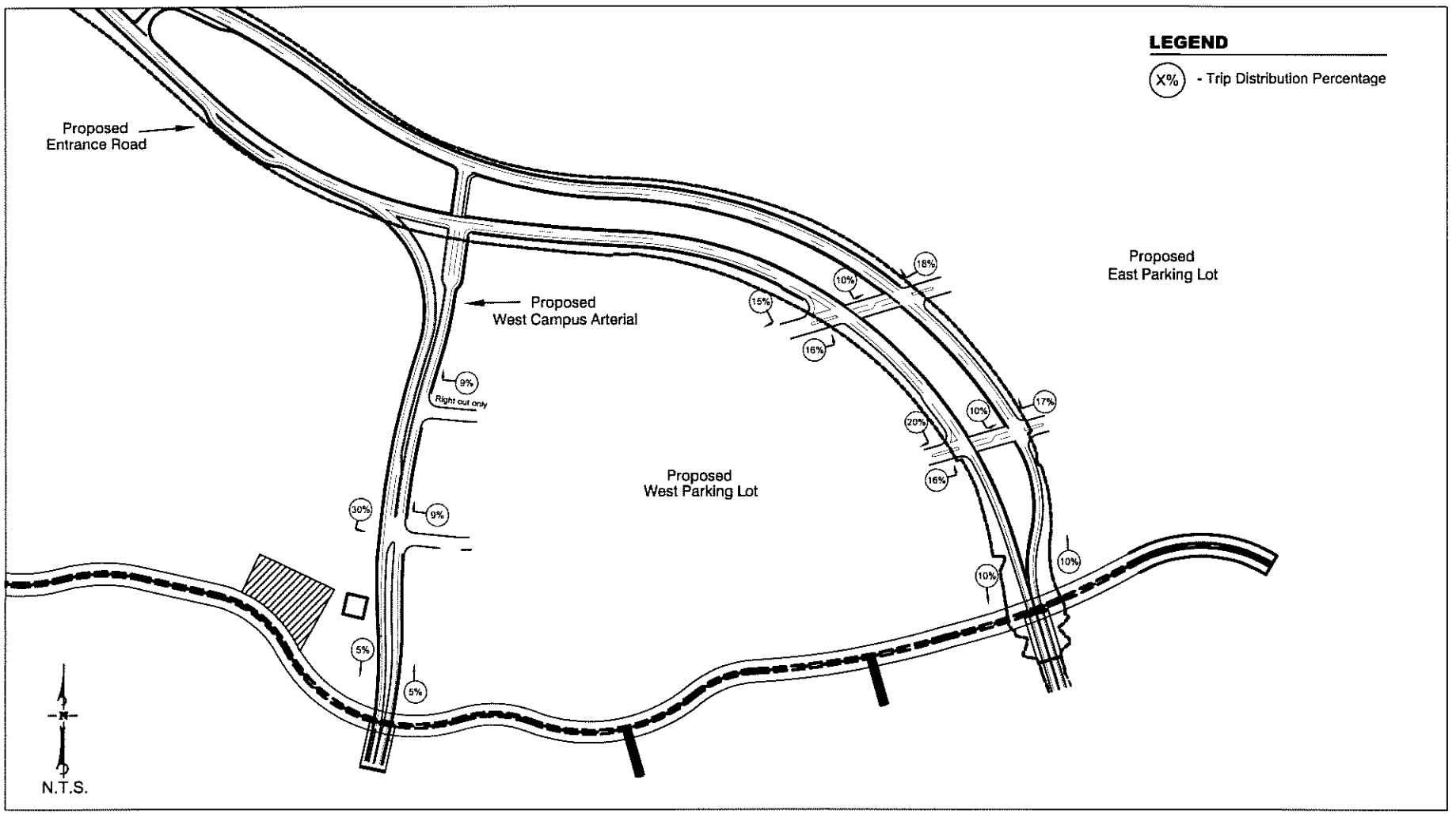
This concludes our preliminary traffic analysis of the proposed Entrance Road. Please don't hesitate to contact me if you have any questions regarding the information presented above. If you wish to contact me directly, I can be reached at (805) 963-9532, x157 or via email at dbr@penfieldsmith.com.

Sincerely,
PENFIELD & SMITH



Derek Rapp
Transportation Department Manager
Principal Engineer, TR 2026

Enclosures



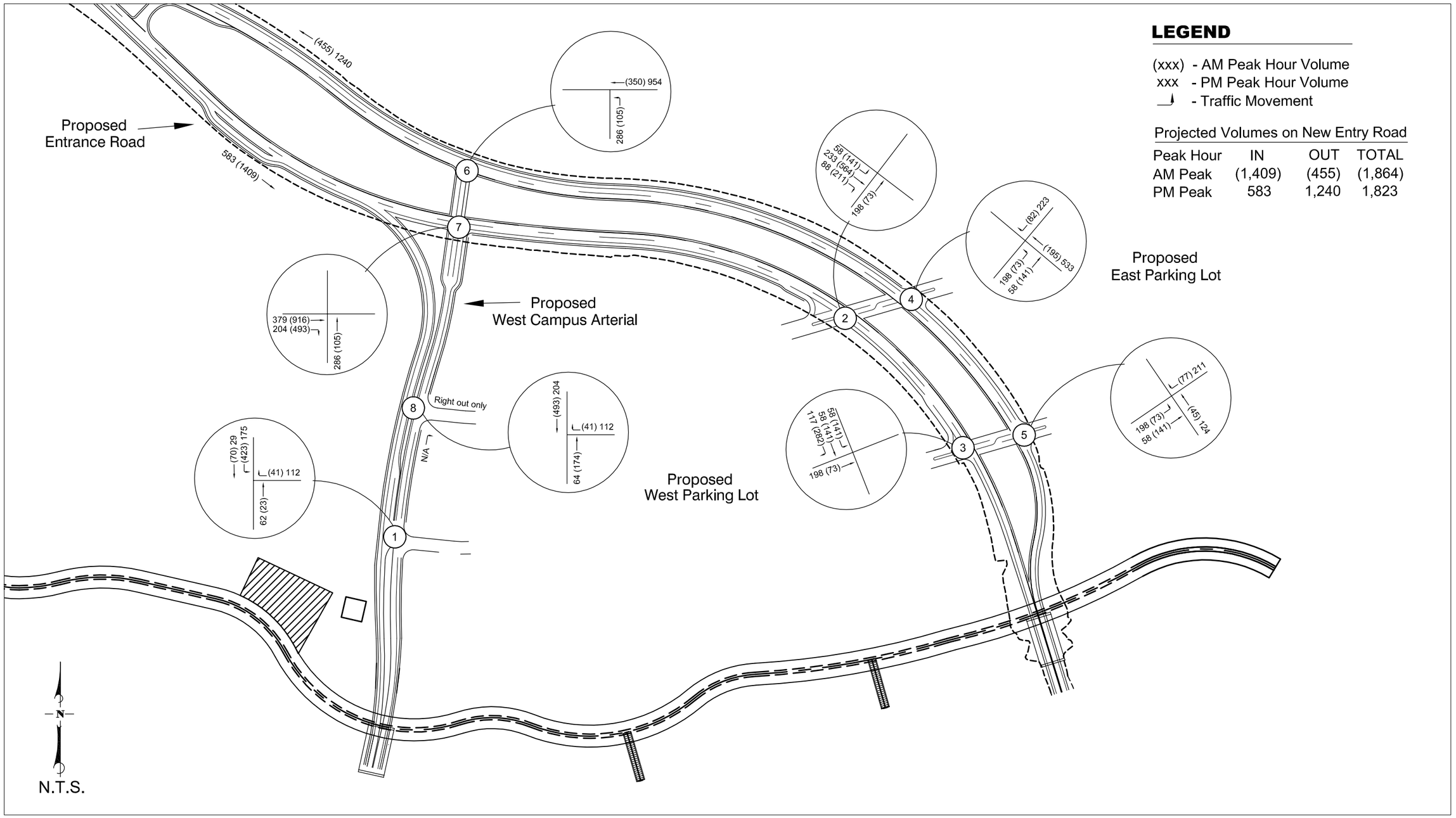
Penfield & Smith
Engineering · Surveying · Planning
· Construction Management ·

EXHIBIT 1

PROJECT TRIP DISTRIBUTION

CAL STATE CHANNEL ISLANDS

W.O. 18113.01 1811.3TRAFFIC.DWG



LEGEND

(xxx) - AM Peak Hour Volume
xxx - PM Peak Hour Volume
- Traffic Movement

Projected Volumes on New Entry Road

Peak Hour	IN	OUT	TOTAL
AM Peak	(1,409)	(455)	(1,864)
PM Peak	583	1,240	1,823

Penfield & Smith
Engineering · Surveying · Planning
· Construction Management ·

EXHIBIT 2

PROJECT TRIP GENERATION
CAL STATE CHANNEL ISLANDS

W.O. 18113.01 18113TRAFFIC.DWG

December 19, 2008 08125.01L01.wpd

Steve Svete
Rincon Consultants
790 East Santa Clara Avenue
Ventura, CA 93001

TRAFFIC ANALYSIS FOR THE CALIFORNIA STATE UNIVERSITY CHANNEL ISLANDS RECREATIONAL OPEN SPACE PROJECT, VENTURA COUNTY

Associated Transportation Engineers (ATE) has prepared the following traffic study for the California State University Channel Islands (CSUCI) Recreational Open Space Project. The study addresses potential traffic impacts associated with the project within the Ventura County area adjacent to the CSUCI campus.

Project Description

The project is proposing to transfer the existing Camarillo Regional Park open space area, located adjacent to the CSUCI campus, from Ventura County to the University. The open space area is currently a passive recreation area that includes hiking trails, an airstrip used for model airplanes, and a pond used for remote control boats. The project is proposing to remove the existing model airplane airstrip and remote control boat pond and improve the trail head area and the hiking trails. The University also proposes to use the area to provide educational environmental activities that would be attended by CSUCI students and staff and would also be occasionally used by visiting grade (K-12) schools. The project does not include any other new uses for the open space area. Access to the park would be provided via the existing roadway connection from University Drive. Figure 1 shows the location of the project within the County.

EXISTING CONDITIONS

Street Network

The project site is served by a network of highways, arterial streets and collector streets, as illustrated in Figure 1. The following text provides a brief discussion of the major components of the study-area street network.

Lewis Road, located west of the project site, has been expanded to a four-lane arterial roadway between the City of Camarillo on the north and University Drive on the south. Lewis Road provides the primary regional access connection to the existing park facility and the CSUCI campus via its connection to University Drive. Lewis Road extends south of University Drive as a two-lane road to Portrero where it becomes Hueneme Road. Within the study-area Lewis Road, is signalized at the Cawelti Road and University Drive intersections.

Cawelti Road, located north of the project site, is a two-lane road that extends from Lewis Road to Las Posas Road on the west. Within the study-area, Cawelti Road is signalized at the Lewis Road and Las Posas Road intersections.

University Drive, located west of the project site, is two-lane road that extends easterly from Lewis Road and serves the CSUCI campus. An roadway connection (Old Dairy Road) to University drive provides access to the project site. Within the study-area, University Drive is signalized at the Lewis Road intersection.

Roadway Operations

Existing average daily traffic (ADT) volumes for the study-area roadways are illustrated in Figure 2. In determining the operational characteristics of the roadway segments, "Levels of Service" (LOS) A through F are applied, with LOS A indicating free flow conditions and LOS F indicating severe congestion. Ventura County has adopted LOS D as the minimum operating standard for County thoroughfares and State Highways located within the County.

Levels of service for the study-area roadway segments were determined based on a the roadway capacities adopted by Ventura County (see capacity table in the Technical Appendix). Table 1 presents the existing ADT volumes and levels of service for the study-area roadways.

Table 1
Existing Average Daily Traffic

Roadway Segment	Classification/Geometry	Existing ADT	LOS
Lewis Road n/o Cawelti Road	Class I / 4-Lane	13,200 ADT	LOS A
Cawelti Road w/o Lewis Road	Class I / 2-lane	1,800 ADT	LOS A
Lewis Road n/o Potrero Road	Class I / 4-Lane	6,700 ADT	LOS A

The data presented in Table 1 indicate that the study-area roadways currently operate at LOS A which is considered acceptable based on Ventura County standards.

Intersection Operations

Given the existing roadway volumes and operations (LOS A) and the recent improvements that have been made to Lewis Road (i.e. widening to 4-lanes and installation of traffic signals at the Cawelti Road and University Drive intersections) it is estimated that the intersections currently operate in the LOS A - B range during the A.M. and P.M. peak hour periods. These operations would be considered acceptable based on the County's LOS D standard.

Project Trip Generation

As noted in the project description, the existing 279-acre Camarillo Regional Park contains a model airplane facility and a remote control boat pond that will be removed from the park as part of the environmental restoration of the area. Removal of these facilities would result in reductions in traffic generated at the site. The University is not proposing to increase staff or faculty as a result of acquiring the regional park, thus there would be no traffic increases related to the staffing and maintenance of the park. Traffic generated by the proposed educational activities would be from CSUCI students and staff that are on the existing campus and would not utilize County roadways to access the site.

The project does include some enhancements to facilitate public access to the open space area that could increase traffic traveling to and from the site. There would also be occasional trips made from area schools to visit the site.

Trip generation estimates were developed for the existing Camarillo Regional Park facility based on the rates contained in the SANDAG Traffic Generators report for parks. Table 2 shows the trip generation estimates developed for the existing park. Given that some of the existing recreational uses will be removed from the site, it is not anticipated that the overall traffic generation at the park will change measurably as a result of the project.

However, in order to provide a conservative assessment of future traffic, it is assumed that

traffic generated at the park could increase by 5% as a result of the proposed public access improvements and the off-site school visits. This traffic increase is also shown in Table 2.

Table 2
Project Trip Generation

Land-Use	Size	ADT		A.M. Peak Hour		P.M. Peak Hour	
		Rate	Trips	Rate	Trips	Rate	Trips
Existing Open Space	279 Acres	1.0 (a)	279	0.04 (a)	11	0.08 (a)	22
Future Traffic Added 5% Increase	279 Acres	+14 Trips		+1 Trip		+1 Trip	

(a) SANDAG Park Rates

The data presented in Table 2 show that the future use of the park could generate 14 ADT and 1 A.M. and 1 P.M. peak hour trip.

PROJECT-SPECIFIC ANALYSIS

Roadway Operations

The addition of 14 average daily trips to the Ventura County roadways adjacent to the site would not significantly impact roadway operations. The roadways currently operate at LOS A and could continue to operate at LOS A with the addition of the 14 ADT. The project would therefore not impact the County roadway network based on Ventura County impact thresholds.

Intersection Impacts

The addition of 1 peak hour trip to the study-area intersections would not impact operations on the surrounding County roadways. The intersections currently operate in the LOS A-B range and the addition of 1 peak hour trip would not effect operations. The project would therefore not impact the adjacent intersections based on Ventura County impact thresholds.

Site Access

Access to the existing park is provided via a roadway connection (Old Dairy Road) to University Drive, located just south of the Calleguas Creek bridge. The existing driveway approach at University Drive does not provide traffic control or striping that defines ingress or egress for vehicles entering and exiting the site.

It is therefore recommended that the project improve the driveway approach to provide standard intersection striping to define egress and ingress and install a stop-sign and provide a striped stop-bar at the outbound approach.

The project access road is currently controlled by a gate located approximately 130-feet east of University Drive. The existing distance of 130' between the driveway gate and University Drive provides an adequate length for vehicle storage (approximately 6 vehicles) so that traffic queues at the park gate would not extend to University Drive and potentially interfere with through traffic.

Parking

There is currently no formal centralized parking area for the park. Observations at the existing site indicate that vehicles park in various areas, such as adjacent to the model airplane strip and near the old dairy.

The project will provide a centralized parking area once the existing facilities are removed and the improvements to the area have been implemented. Thus parking will be provided in a more formalized and organized fashion at the site.

BUILDOUT ANALYSIS

Roadway Operations

Roadway volumes for the Buildout scenario were derived from the data published in the EIR completed for the CSUCI Campus Master Plan Project. The ADT volumes include traffic from buildout of the County's General Plan and completion of the CSUCI campus master plan project. Buildout ADT volumes are presented on Figure 3 and Buildout roadway operations are shown in Table 3.

Table 3
Buildout Average Daily Traffic Volumes

Roadway Segment	Classification/Geometry	Buildout ADT	LOS
Lewis Road n/o Cawelti Road	Class I / 4-Lane	34,100 ADT	LOS C
Cawelti Road w/o Lewis Road	Class I / 2-lane	12,100 ADT	LOS D
Lewis Road n/o Potrero Road	Class I / 4-Lane	41,300 ADT	LOS D

The data presented in Table 3 indicate that the study-area roadways are forecast to operate at LOS D or better under the Buildout scenario. These operations are considered acceptable based on the LOS D operating standard for roadways located in the unincorporated areas of the County.
The addition of the 14 average daily trips that could potentially be generated by the project would not generate a significant cumulative impact to the County roadways under the Buildout + Project scenario, as all of the roadways would continue to operate at LOS D or better.

Intersection Operations

The EIR completed for the CSUCI Campus Master Plan Project identified future operational deficiencies at the Lewis Road/University Drive and Lewis Road/Cawelti Road intersections. The EIR recommended that Lewis Road be widened to 4 lanes at the intersections and that traffic signals be installed at both locations in order to accommodate Buildout traffic volumes. These Buildout mitigation measures have been installed at both intersections.

The addition of one peak hour trip that could potentially be generated by the project would not generate significant cumulative impacts at the study-area intersections under the Buildout + Project scenario, as the mitigations required at the adjacent intersections to accommodate buildout of the campus have been installed.

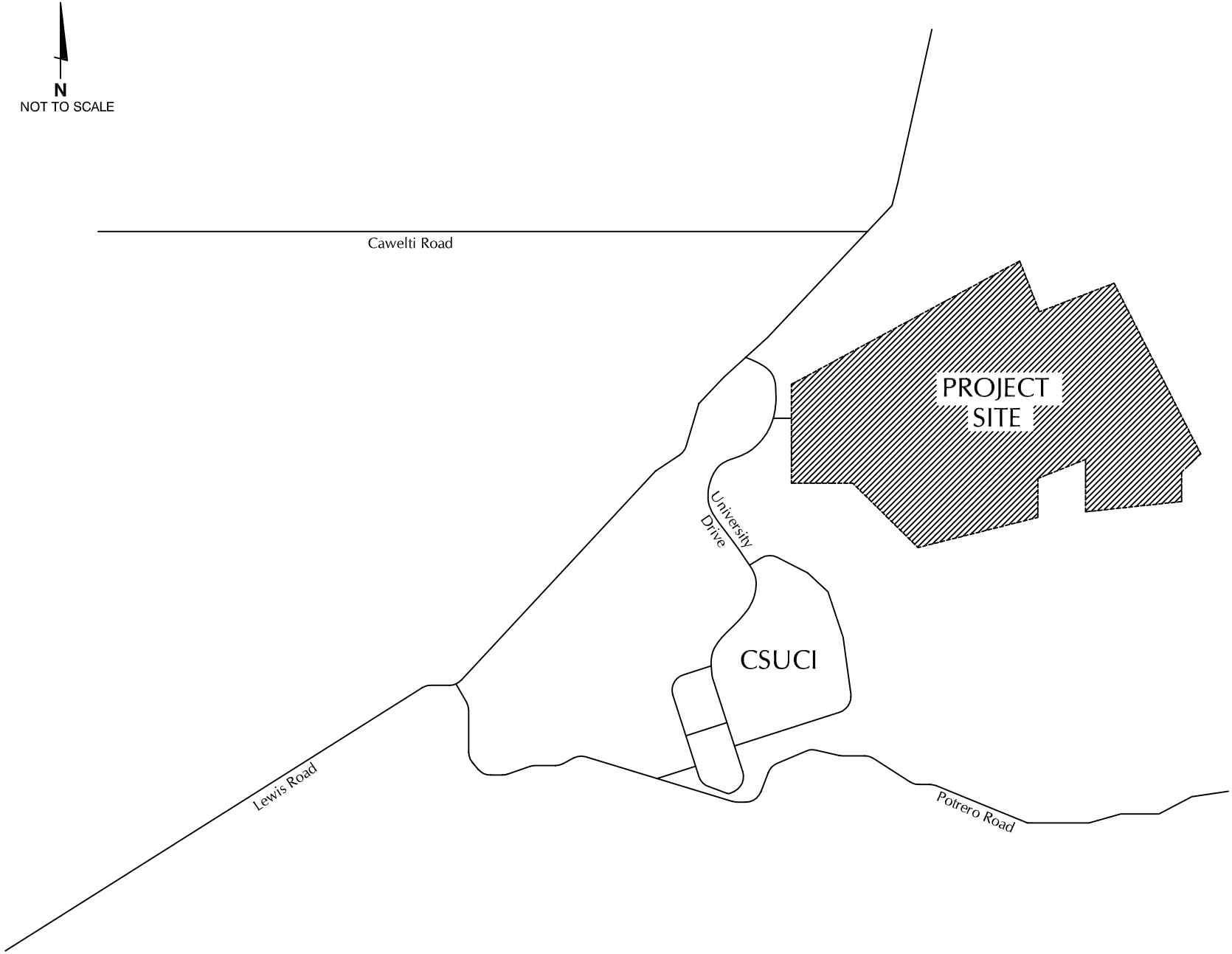
This concludes out traffic assessment for the CSUCI Recreational Open Space Project.

Associated Transportation Engineers

Scott A. Schell, AICP, PTP

SAS/MMF

Attachments

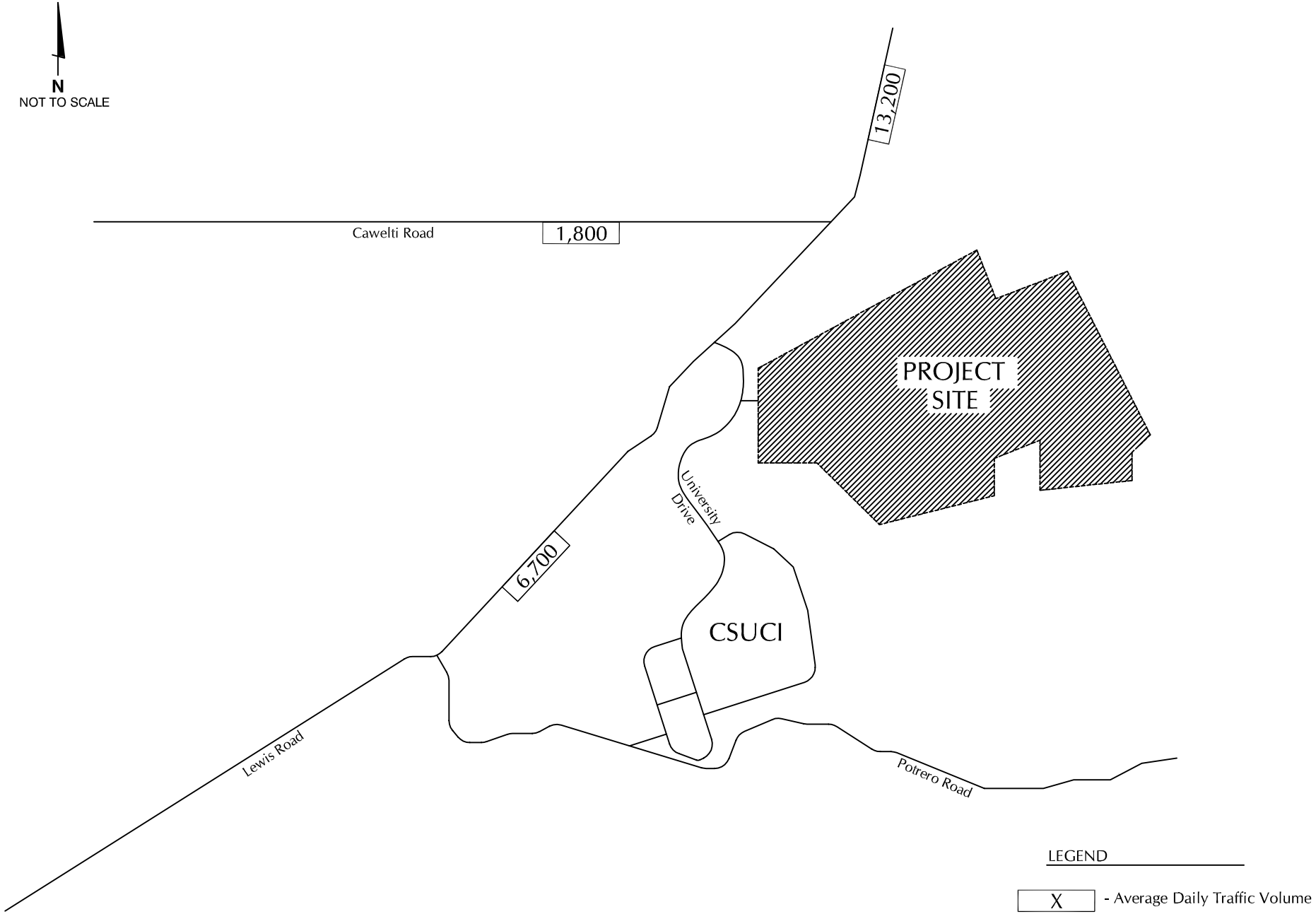


Associated Transportation Engineers

EXISTING STREET NETWORK AND PROJECT LOCATION

FIGURE 1

Initials - ATE#

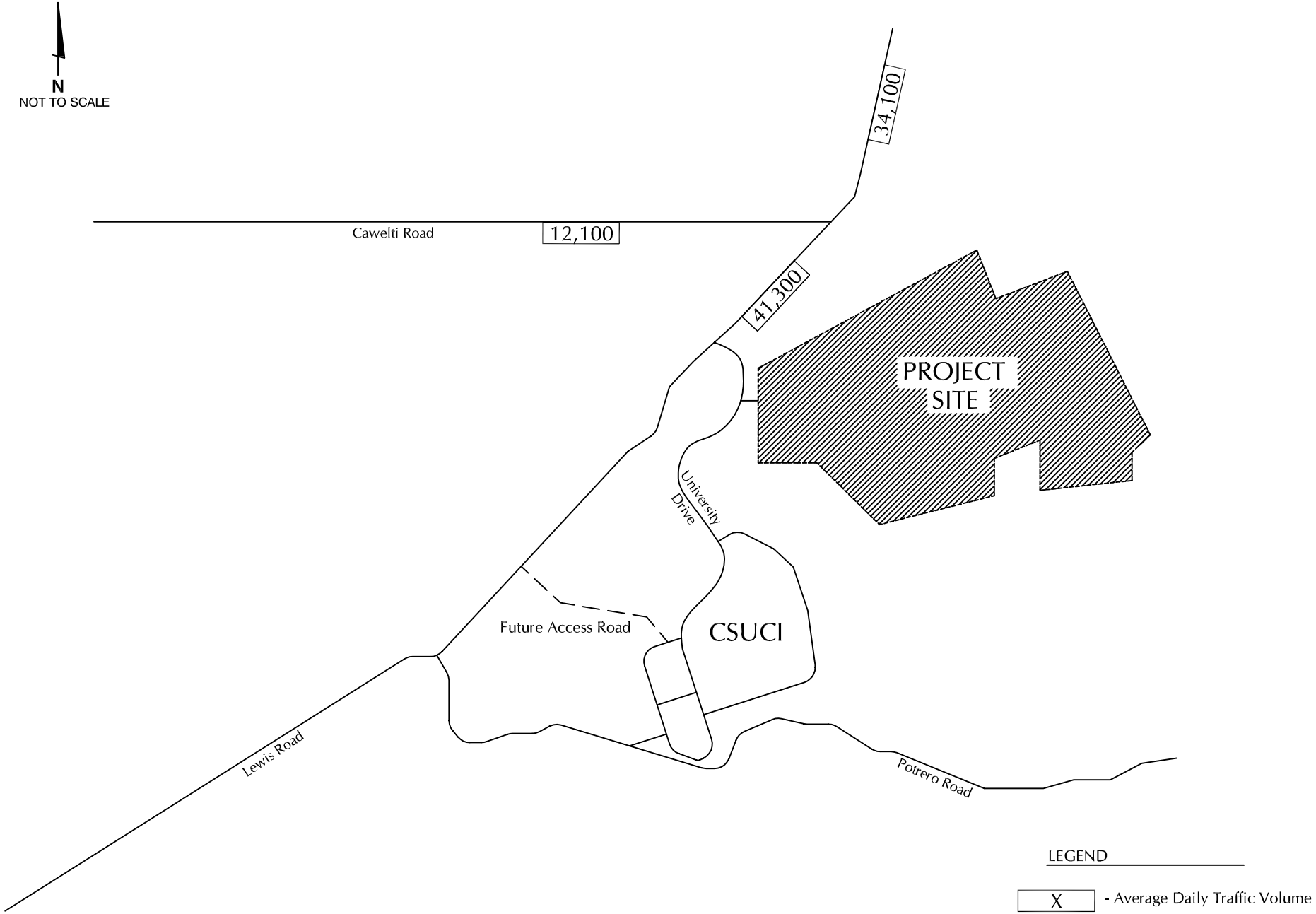


Associated Transportation Engineers

EXISTING AVERAGE DAILY TRAFFIC VOLUMES

FIGURE 2

Initials - ATE#



ASSOCIATED TRANSPORTATION ENGINEERS

BUILDOUT AVERAGE DAILY TRAFFIC VOLUMES

FIGURE 3

Initials - ATE#