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**Civil and Transportation Engineering**

January 11, 2019

Ms. Diane Dittmar  
Project Manager  
Palo Alto Housing  
2595 E. Bayshore Road  
Suite 200  
Palo Alto, CA 94303

RE: 950 El Camino Real, Mountain View; Traffic Analysis

Dear Diane,

At your request I have prepared a preliminary traffic impact analysis for the proposed apartment development located at 950 El Camino Real in the City of Mountain View. The analysis did not reveal anything that would require traffic mitigation.

Should you have any questions regarding the analysis please contact me at your convenience at 650-212-0837 or by e-mail to [rhopper@rkhengineering.com](mailto:rhopper@rkhengineering.com).

Sincerely,

**RKH**

A handwritten signature in black ink that reads "Richard K. Hopper". The signature is written in a cursive style with a large, stylized 'H'.

Richard K. Hopper, P.E.  
Principal

Encl.

**PRELIMINARY TRAFFIC ANALYSIS  
950 EL CAMINO REAL, MOUNTAIN VIEW, CA**

**January 11, 2019**

**PROJECT DESCRIPTION**

The project consists of a single 5-story building with 71 apartment units on a 26,531 square foot lot located at 950 El Camino Real in the City of Mountain View. Figure 1, Location Map, page 2, shows the location of the development on El Camino Real situated north of Castro Street in Mountain View.

The building will be 70 studio apartments and one 2-bedroom apartment. One-hundred percent of the units are designated for low, very low, and extremely low income residents.

**ANALYSIS OBJECTIVE**

The objective of this analysis is to estimate the vehicular generation and distribution and to identify any intersections that will require a detailed analysis.

**VEHICULAR TRAFFIC GENERATION**

The vehicle trip generation rates as presented in *Trip Generation*<sup>1</sup> for conventional residential developments are without regard to the income levels of the residents. This development is classified as a mid-rise apartment, land use code 221, in *Trip Generation*. For a mid-rise apartment building with 71 dwelling units *Trip Generation* predicts the afternoon peak hour vehicle trip generation of 32 trip ends.

There is little data on the traffic generation of low or very low income residential developments. The tables on the next page show a relationship between household income and household person trips. These two independent sources of household travel by income level are remarkably similar in their findings. The accessibility to privately operated vehicles (POV) diminishes as income is reduced and persons with lower income tend to use alternative transportation modes such as public transit, bicycles and walking. Table C on page 4 shows the estimated vehicle trip generation for this development based on ITE data moderated by income level. It is recognized that household incomes in Santa Clara County are much higher than the national average, but the tables are representative of the relative variations of household trips to household income. It is the relative differences that are important, not actual incomes.

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<sup>1</sup> Institute of Transportation Engineers, 10<sup>th</sup> Edition, © 2018



**LOCATION MAP  
FIGURE 1**

Income Range	Daily Person-Trips per Household	Percent of Average
Less than \$30,000	5.52	67%
\$30,000 to \$50,000	6.94	84%
\$50,000 to \$80,000	9.53	115%
More than \$80,000	11.16	135%
Average	8.28	

The National Household Travel Survey of 2017 (NHTS) reported person trips by household income. That information taken from its report is shown in Table B below.

Income	Average Daily Person Trips per Household	Percent of Average
<\$15,000	6.07	71%
\$15-\$24,999	6.79	79%
\$25-34,999	7.56	88%
\$35-\$49,999	8.16	95%
\$50-\$74,999	8.69	101%
\$75-\$99,999	9.55	111%
\$100,000+	11.05	128%
Average	8.60	

In addition to the information above, the 2017 NHTS data revealed that for households with income below \$25,000 the number of daily vehicle trips per household was 61% of average. See table in the Appendix.

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<sup>2</sup> Puget Sound Regional Council, June 2009

<sup>3</sup> U.S. DOT, 2017 National Household Travel Survey, Summary of Travel Trends, Table 8

Table C: 950 El Camino Real, Mountain View Vehicle Trip Generation									
LAND USE	SIZE	UNITS	AM PEAK HOUR			PM PEAK HOUR			AWDT
			IN	OUT	TOTAL	IN	OUT	TOTAL	
Mid-Rise Apartment	71	DU	4	12	16	13	8	21	250

AWDT = Average Weekday Traffic (24-hr. volume)  
 The estimates of vehicle trip generation are taken at 65% of those calculated from *Trip Generation* (ITE, 10<sup>th</sup> Edition © 2018) based on Tables A and B, page 3. See detailed trip generation table in the Appendix.

**VEHICLE TRIP DISTRIBUTION**

The distribution of vehicle trips generated by the apartments is dependent upon the purpose of the trip. The 2017 NHTS has quantified trip purpose as a percentage total trips. This is shown in Table D below.

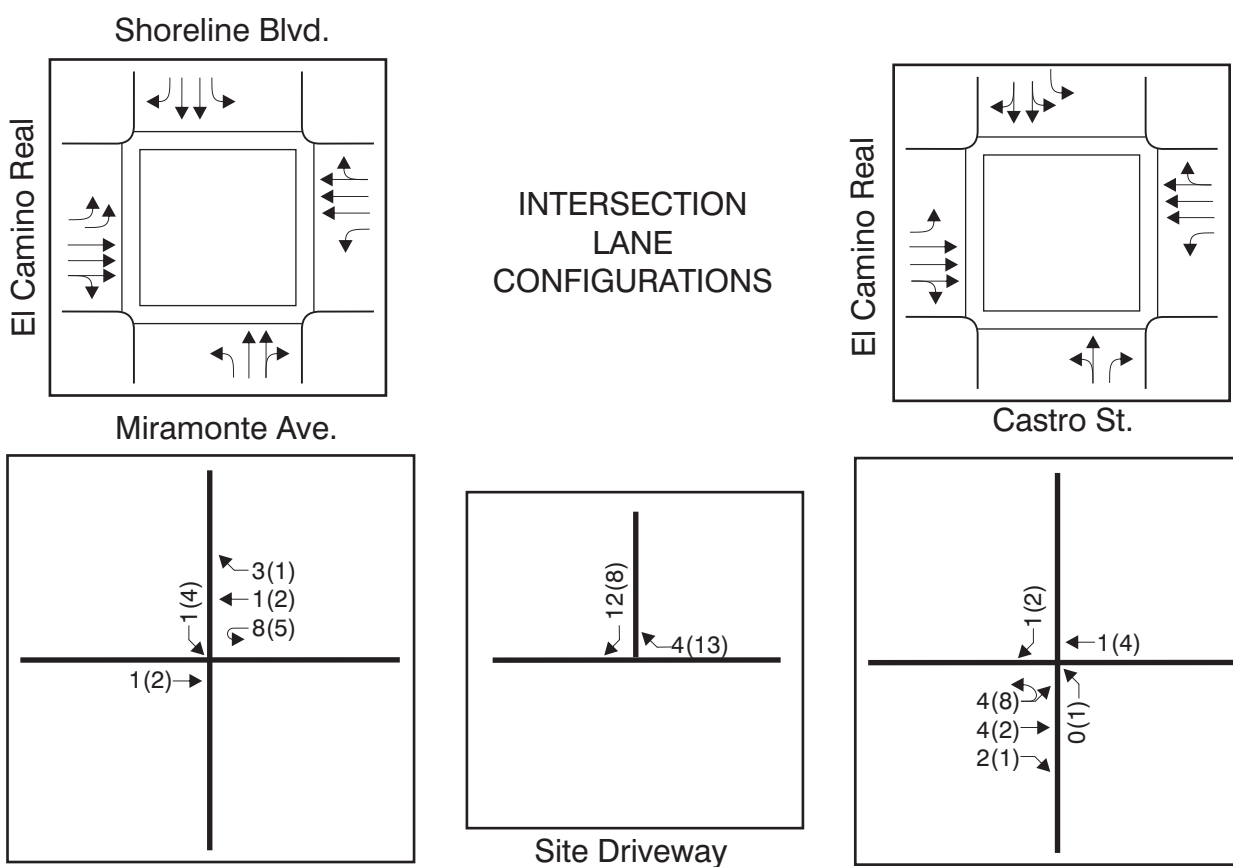
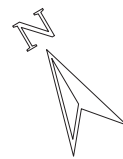
Table D: Trips by Trip Purpose <sup>4</sup>	
Trip Purpose	% of Total
To/From Work	24.1%
Work-Related Business	2.0%
Shopping	19.9%
Other Family/Personal Business	20.9%
School/Church	5.2%
Medical/Dental	2.4%
Visit Friends/Relatives	5.7%
Other Social/Recreational	15.8%
Other	4.0%
Total	100.0%

The project site is located between two major intersections on El Camino Real. Traffic into and out of the site is right-turn only as the street is median divided. Figure 2, Project Only Peak Hour Traffic Volumes, page 5, shows the intersection lane configurations and the distribution of project generated peak hour trip ends through these two intersections.

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<sup>4</sup> National Household Travel Survey, Table 8.7





**PROJECT ONLY PEAK HOUR TRAFFIC VOLUMES**

**PROJECT ONLY PEAK HOUR  
TRAFFIC VOLUMES  
FIGURE 2**



The City of Mountain View's criteria for determining whether an intersection will require detailed evaluation is 10 project generated vehicle trip ends per approach lane during peak traffic hours. The distribution of project generated vehicle trips does not trigger the requirement for detailed analysis of these two intersections.

## **VEHICULAR PARKING GENERATION**

The development proposes to provide 32 ground level parking spaces for vehicles based on a parking ratio of 0.45 spaces per dwelling unit plus two spaces for motorcycles. See Figure 3, Site Plan, page 7. If this were a conventional apartment building with 71 units of the mix proposed, the City of Mountain View Zoning Code would require 71 resident parking spaces. Because this project is 100% designated for low and very low income residents, State requirements for parking override local zoning requirements for parking. AB744 enacted by the State legislature and signed by the Governor in 2015 mandates that the required parking per dwelling unit shall not exceed 0.5 spaces per dwelling unit.

In a report to the City Council from the Community Development Department dated March 22, 2016, it was recommended that a parking ratio of 0.45 spaces per dwelling unit be applied to an affordable housing project based on a study by traffic consultant CDM Smith. Parking ratios based on actual nearby studies of similar developments are far superior to the data contained in publications such as ITE's *Parking Generation*, 4<sup>th</sup> Edition. Because the project is located on El Camino Real, the availability and proximity of public transit services is much more intense. VTA operates bus routes #22, 52, and 522 on W. El Camino Real in the vicinity of the project site. The Mountain View Transit Center (Caltrain and LRT) is less than a mile from the project site.

A parking ratio of 0.45 per dwelling unit is appropriate for this development and is in line with the requirements of AB744.



**W EL CAMINO REAL**

**SITE PLAN  
FIGURE 3**





## CONCLUSIONS AND RECOMMENDATIONS

Because of the extremely high density (117 DU/AC) and the 100% designation for low and very low income residents, this development is estimated to generate only 16 vehicle trip ends in the morning peak hour, 21 trip ends in the afternoon peak hour, and 250 total trip ends daily during the week.

Given the nature of this development, this project does not have any quantifiable impacts on traffic and parking, and, therefore, no measures of mitigation are recommended.

*Richard K. Hopper*

Richard K. Hopper, P.E.  
Principal



**APPENDIX**

950 El Camino Real, Mountain View  
 Vehicle Trip Generation Table  
 December 12, 2018

LAND USE	LU CODE	SIZE	UNITS	TRIP GENERATION RATE*						TRIP GENERATION VOLUME													
				A.M. PEAK HOUR			P.M. PEAK HOUR			A.M. PEAK HOUR			P.M. PEAK HOUR										
				IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL	AWDT							
Mid-Rise Apartment	221	71	DU	0.09	0.26	0.34	0.27	0.18	0.45	5.43	6	18	24	19	12	32	385						
Mid-Rise Apartment - Low Income				65% of published rates and volumes													4	12	16	13	8	21	250

\*Sources: ITE, Trip Generation, 10th Edition © 2018, using fitted curve equations

\*\*AWDT = Average Weekday Traffic (24-hr. vol.)

2017 NHTS SUMMARY

Income	Households		Travel Day		Average Daily Person		Travel Day		Travel Day		Percent of Average		Vehicles per Household		Percent of Average	
	Households	Person Trips	Person Trips	Household	Trips per Household	Household	Household	Household	Household	Household	Household	Household	Household	Household	Household	Household
<\$10,000	8607	19515	19515	2.3	72%	7506	0.9	46%	6863	0.8	42%					
\$10-\$14,999	6900	14818	14818	2.1	68%	7528	1.1	58%	7167	1.0	55%					
\$15-\$24,999	11202	27751	27751	2.5	78%	15521	1.4	74%	14845	1.3	70%					
\$25-\$34,999	11471	31619	31619	2.8	87%	18890	1.6	88%	18000	1.6	83%					
\$35-\$49,999	14169	42213	42213	3.0	94%	27100	1.9	102%	25748	1.8	96%					
\$50-\$74,999	18953	60126	60126	3.2	100%	38000	2.0	107%	38986	2.1	109%					
\$75-\$99,999	14091	49144	49144	3.5	110%	30807	2.2	116%	31643	2.2	119%					
\$100-124,999	10749	41602	41602	3.9	122%	25441	2.4	126%	26382	2.5	130%					
\$125-\$149,999	6131	24684	24684	4.0	127%	14855	2.4	129%	15480	2.5	134%					
\$150-199,999	5976	24426	24426	4.1	129%	14480	2.4	129%	14984	2.5	133%					
\$200,000+	6304	26905	26905	4.3	135%	15275	2.4	129%	16264	2.6	137%					
	114553	362803	362803	3.2	100%	215403	1.9		216362	1.9						
<\$25,000				2.3	73%		1.1	61%		1.1	57%					