

# Memorandum



Kimley-Horn  
and Associates, Inc.

**To:** Gail Likens and Shahla Yazdy (Palo Alto Staff), College Terrace Traffic Calming PAC  
**From:** Jim West and Michael Mowery  
**Re:** College Terrace Traffic Calming After Study  
*Meeting Discussion Item Summary Memorandum*  
**Date:** 8 April 2008

## OVERALL PROJECT BACKGROUND

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The College Terrace neighborhood, located between Stanford University and Stanford Research Park, has historically been affected by cut-through traffic and speeding for more than 20 years. The area consists primarily of residential housing except for a small amount of commercial uses bordering El Camino Real.

Unlike neighboring streets with curvilinear alignments or disconnected superblocks, College Terrace has a grid street layout with long straight roadways interrupted by stop signs. Consequently, many drivers use the neighborhood as a cut-through route, and residents and non-residents exceed the posted speed limits. Past efforts to manage traffic included street closures that were effective for the treated streets, but resulted in traffic shifts and additional impacts on adjacent routes. Over the years, particularly since 1999, traffic has increased noticeably, thus placing further pressures on the remaining streets open to traffic.

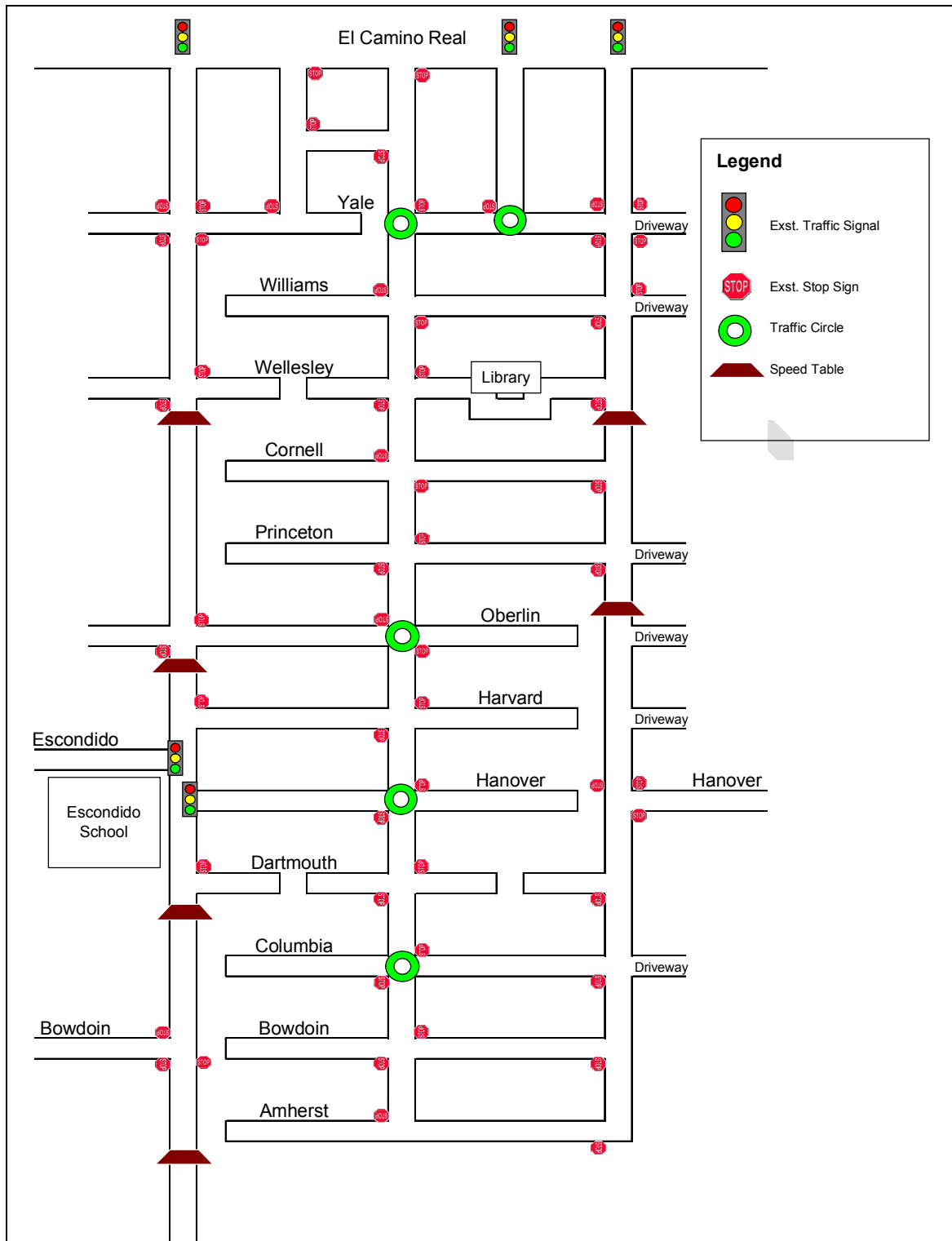
In an effort to request assistance from the city to address speeding and traffic volume concerns, over 225 College Terrace residents signed a petition to the City Council in September 1999. College Terrace residents identified improved traffic management and mitigation as important neighborhood issues. Preparation of a traffic management study was also part of the mitigation requested by the city and ultimately included in Santa Clara County's list of mitigations required of Stanford University for its December 2000 General Use Permit.

In 2003, Kimley-Horn was retained by the City of Palo Alto to undertake the College Terrace Neighborhood Traffic Management Plan (NTMP) to identify solutions for the traffic impacts identified through traffic data collection in the neighborhood as well as the residents' experience. Improvements were focused on enhancing traffic safety, fostering travel within, and to/from the neighborhood by bicycle and on foot, and reducing excessive motor vehicle speeds, cut through motor vehicle travel, and traffic noise. The intent of the College Terrace Neighborhood Traffic Management Plan was to tailor solutions to specific locations and to help residents and non-residents recognize that a comprehensive traffic management plan can benefit everybody through improved safety and livability. Throughout the development of the NTMP, meetings were held at critical project stages with a representative Project Advisory Committee and three public meetings were held at Escondido Elementary School

with the neighborhood to develop a preferred NTMP. The residents of College Terrace were surveyed on their approval of the preferred NTMP option and had a response rate of 41%, with more than 71% of those respondents accepting the preferred plan.

Following Council approval, traffic circles, speed tables and other traffic management measures were installed in late 2006 on the border and interior streets of the College Terrace neighborhood. The one-year trial of the College Terrace Plan is now complete, and this after study has been commissioned by the City to assess the effectiveness of the measures, both in terms of traffic management as well as meeting neighborhood expectations.

**Figure 1: Approved College Terrace Traffic Calming Plan**



## **AFTER STUDY DATA COLLECTION AND RESULTS**

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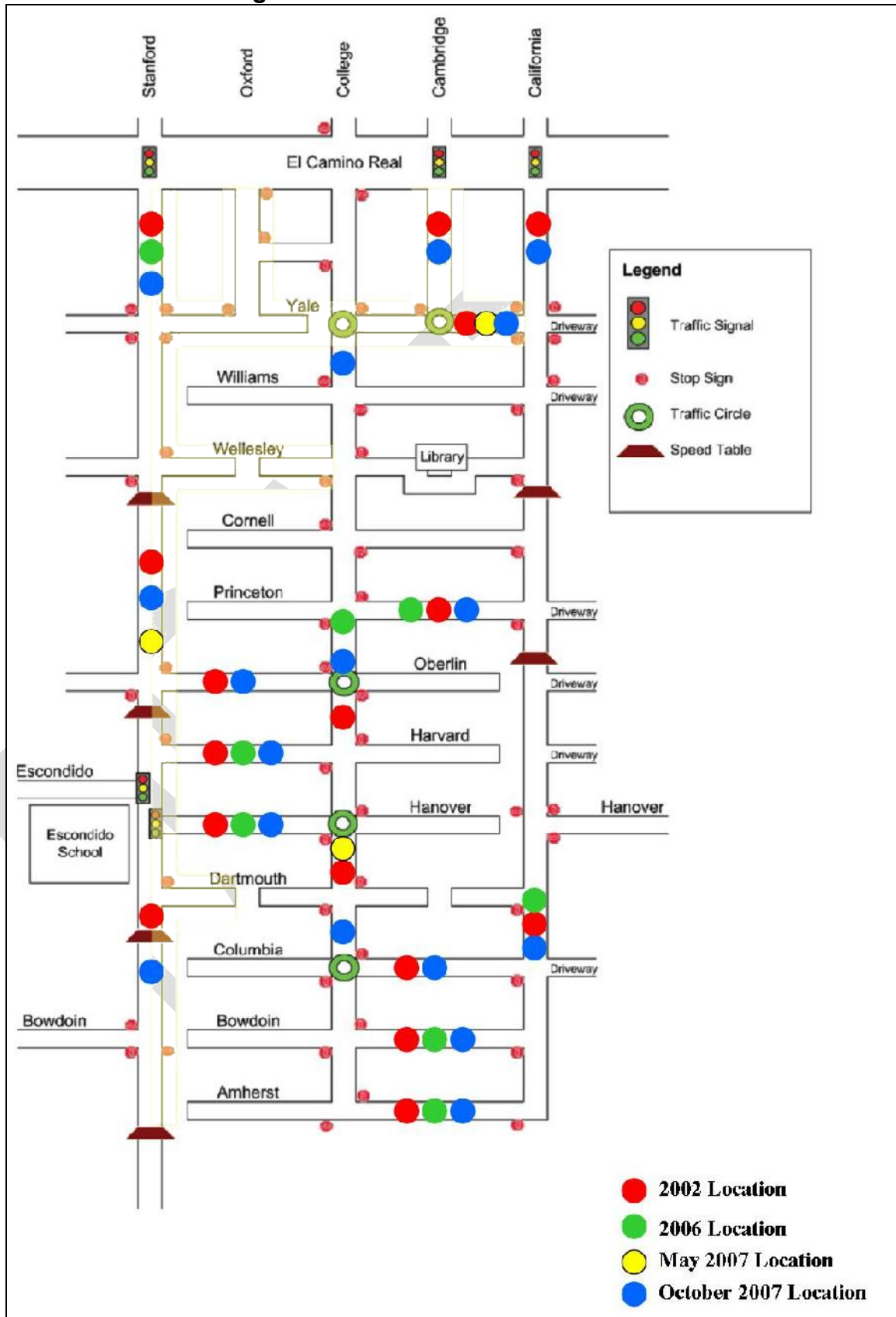
In May 2002 and May 2006, baseline speed and volume data was collected in anticipation of the roadway improvements. For this analysis, the 2002 data was used to calculate the percentage changes for vehicles traveling over 25 and 35 miles per hour, while the 2006 data was utilized to analyze average daily volumes (ADT) in the neighborhood as it was the most comprehensive and recent to when the measures were installed.

Kimley-Horn received “Before Study” and “After Study” vehicle speed and volume information from the City of Palo Alto for use in this study. The “Before Study” information was from mechanical tube counts collected in May 2006. The “After Study” information was from mechanical tube counts collected in May and October 2007. This information was used in conjunction with the May 2002 data collected for the original NTMP project to determine the before and after effects of the traffic calming measures. This memorandum summarizes the results of the comparison.

The data utilized for this analysis were collected at the following locations, which are also shown in Figure 2.

- Stanford between El Camino Real and Yale
- Stanford between Wellesley and Oberlin
- Stanford between Dartmouth and Bowdoin (2002 only)
- College between Princeton and Harvard
- College between Hanover and Columbia (2002 only)
- Cambridge between El Camino Real and Yale (2002 only)
- California between El Camino Real and Yale (2002 only)
- California between Dartmouth and Columbia
- Yale between Cambridge and California
- Princeton between College and California
- Oberlin between Stanford and College (2002 only)
- Harvard between Stanford and College
- Hanover between Stanford and College
- Columbia between College and California (2002 only)
- Bowdoin between College and California
- Amherst between College and California

**Figure 2: Data Collection Locations**



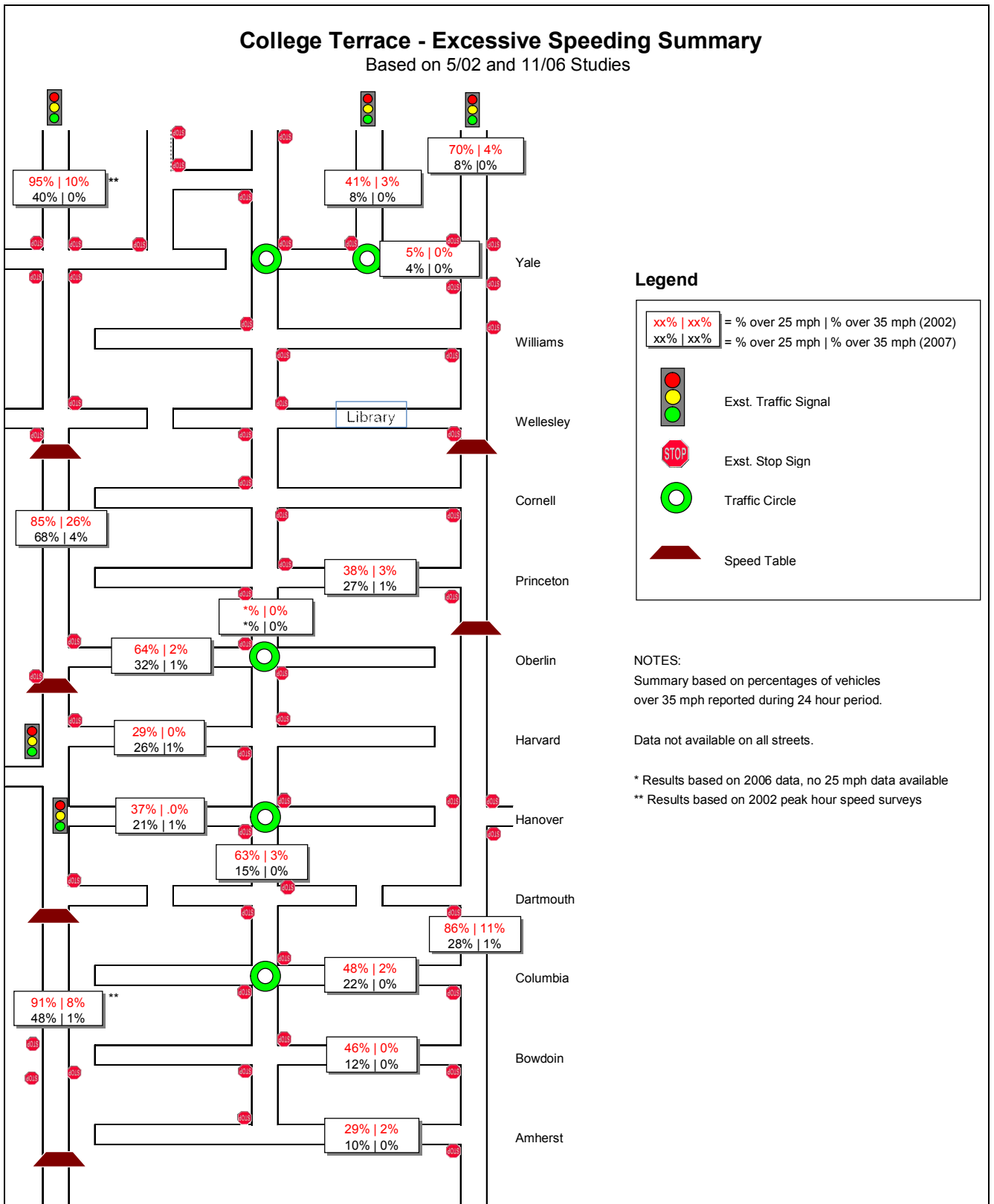
## TRAFFIC SPEED RESULTS

To best understand an expected typical weekday, 24-hour distribution of vehicular traffic volumes and speeds were conducted in the neighborhood. The studies were conducted over two and three day periods in May 2002, May 2006, May 2007 and October 2007. The locations were selected to provide the best layout of mechanical tubes to permit vehicles to travel over the tubes at a consistent and moderate speed. This methodology was used to minimize the errors in the data collection by mechanical tubes that increase when vehicles are accelerating, decelerating, or traveling at a slow travel speed over the tubes.

To analyze the efficacy of the implemented traffic calming devices, speeds were analyzed in before and after conditions. Data from May 2002 was analyzed to reflect the before conditions. Travel speeds were analyzed on a percentage basis of vehicles traveling at specific speeds and the 2002 data was chosen as it was collected at a larger number of locations that more accurately reflect areas where changes may occur after the installation of the equipment.

The percentages of vehicles exceeding 25 mph (the posted speed limit through College Terrace) and 35 mph were calculated for each of the locations shown in Figure 2. The 2002 results are shown in red, while 2007 results are shown in black.

**Figure 3: After Study Vehicle Speed Summary**



## TRAFFIC VOLUME RESULTS

Average daily volumes for each direction in 2007 were compared to the data collected in 2006. The 2002 data was utilized for vehicle speed comparisons since it represented the widest range of data locations, however the 2006 before data was utilized for vehicular volume comparisons since it was collected just prior to the traffic calming devices being installed. This reduces the possibility of localized neighborhood occurrences contributing to the volume changes, which are compared as direct volume counts rather than percentage differences. Examples on localized traffic volume changes may be private business changes at the Stanford Business Park or changes in the commercial uses in the eastern section of the neighborhood. The volumes observed at the study locations are shown in the table and graphic below.

**Table A: After Study Vehicle Volume Summary**

	NB/EB Before	NB/EB After	SB/WB Before	SB/WB After
Amherst	130	127	102	83
Bowdoin	102	101	118	92
California	1041	940	683	701
Cambridge	873	608	1016	833
College	709	783	950	908
Columbia	365	317	380	269
Hanover	545	500	511	460
Harvard	199	187	188	117
Oberlin	467	455	498	300
Princeton	219	271	289	254
Stanford	5203	4636	4760	4216

Traffic volume data was collected on Oregon Expressway and El Camino Real from the County and Caltrans, respectively, to identify any overall trends of increased or decreased volumes within the study area. As seen in the table below, traffic volumes at these neighborhood vicinity locations show limited variation, meaning that changes in volumes traveling through the College Terrace neighborhood are unlikely to be affected by background conditions.

**Table B: Neighborhood Vicinity Traffic Volume Data**

Roadway	Limit 1	Limit 2	Year	AADT
Oregon Expwy	Cowper	Middlefield	2004	34133
Oregon Expwy	Cowper	Middlefield	2008	35041
El Camino	Page Mill		2002	46000
El Camino	Page Mill		2003	43500
El Camino	Page Mill		2004	43000
El Camino	Page Mill		2005	44000
El Camino	Page Mill		2006	43000

**Figure 4: Traffic Volumes in Study Area**

