



MEMORANDUM

Date: December 15, 2022
To: Kathy Layendecker, Castilleja School
From: Alexandra Lee-Gardner, Elynor Zhou, and Robert Eckols, Fehr & Peers
Subject: Castilleja School TDM Monitoring Counts, October 2022

SJ22-2183

INTRODUCTION

As required by the City of Palo Alto, Castilleja School has implemented a Transportation Demand Management (TDM) program. This memorandum summarizes the results of the TDM monitoring counts (mode share, vehicle trips, and parking occupancy) conducted by Fehr & Peers at Castilleja School on September 27th and October 4th, 2022. Castilleja's new Conditional Use Permit approved in June 2022 set an upper limit of 383 vehicle trips during the AM peak arrival hour and 1,198 average daily trips (ADT).

The Fall 2022 enrollment is 416 students with an average daily headcount on campus of around 415 students. All students are currently attending classes in-person on-campus.

The September/October 2022 monitoring results show that Castilleja is generating AM peak hour trips below the threshold of 383 vehicle trips with an average of 337 vehicle trips. The AM peak hour occurs between 7:45 AM and 8:45 AM. Castilleja is also meeting their average daily trip threshold of 1,198 vehicle trips with an average of 985 vehicle trips per day. **Table 1** shows the trip capacity thresholds established by the Conditions of Approval (COA) and Castilleja's compliance based on Fall 2022 monitoring.

DATA COLLECTION

Driveway vehicles counts and parking occupancy counts were conducted on Tuesday September 27th and Tuesday October 4th, 2022, during the morning (7:00 – 9:00 AM) and afternoon (2:00 – 4:00 PM) peak periods. Driveway counts were conducted at school driveways on Emerson Street, Kellogg Avenue, and Bryant Street. The following items were observed:



Table 1: Compliance Matrix

	CUP COA Vehicle Trip Threshold	Sept/Oct 2022 Vehicle Trip Counts	Compliance
Average Daily Trips (ADT)	1,198	985	Yes
AM Peak Hour Trips	383	337	Yes

Source: Castilleja, October 2022

- Number of vehicles entering and exiting the school at each driveway, and vehicle occupancy
- Number of Castilleja students exiting or entering each vehicle (drop-offs & pickups)
- Number of student bicyclists and pedestrians entering and exiting the campus
- Estimated number of riders on each shuttle entering or exiting the campus

Parking occupancy counts were conducted in on-campus parking lots and on adjacent segments of the following streets: Emerson Street, Kellogg Avenue, and Bryant Street. In addition, on-street parking counts were conducted on Melville Avenue, Waverley Street, and blocks of Kellogg, Emerson and Bryant between Alma Street, Waverley Street and Churchill Avenue.

In Fall 2022, the class start time is 8:30 AM and end time is 3:15 PM. Field observations were made on Tuesday September 27th, 2022, during the morning and afternoon peak periods. Drop-off activities began around 7:55 AM for Bryant and Kellogg driveways, which was consistent with the scheduled arrival times for students. The two driveway loops peak around 8:15 AM and traffic dies down by 8:30 AM. No queue spill back was observed onto Bryant Street or Kellogg Avenue. There was residential construction on Bryant Street across from the campus, on Bryant Street a block north of the school, and on Emerson Street across from the staff lot where the shuttles park. However, no construction trucks were observed parked along the school frontages.

In the PM peak period, pick-up activities begin around 3:00 PM, which is consistent with the scheduled end times for the school day. As pick-up activity began to increase, there was some spillover of vehicles onto Kellogg Avenue for less than a minute at 3:20 PM. By 3:40 PM traffic had died down.



VEHICLE COUNTS AND MORNING TRIP RATE

Peak Hour Analysis

Castilleja currently operates under an upper limit of 383 AM peak hour trips as required by the City of Palo Alto. On two typical school days in September and October 2022, an average of 337 total vehicle-trips were observed during the AM peak hour (7:45 AM – 8:45 AM), resulting in an average trip rate of 0.81 vehicle trips per student.

Vehicle trips include all vehicles that arrive and park on campus, drop-off students in school driveways and parking lots. Field observation were made on nearby streets and no on-street drop-offs were observed. During the AM peak hour, approximately 186 individual vehicles accessed the campus, generating a total of 337 vehicle trips.

MODE SHARE

Student arrival mode share was calculated from observations of inbound vehicles, pedestrians, and bicycles during the morning school arrival period (7:00 AM-9:00 AM) on Tuesday September 27th and Tuesday October 4th, 2022. The final mode share is an average of findings from both days of counts weighted to the total student population.

As shown in **Table 2**, a large portion of students (43 percent) were dropped off at Castilleja. During the 7:00 – 9:00 AM arrival period, 6 percent of Castilleja students drove to campus by themselves or with other students and parked on campus. In total, 49 percent of students arrived on campus in private vehicles.

Another 32 percent of students used the school's Caltrain shuttle or school buses to get to campus. The school bus service provides service between designated pick-up locations. There are currently three school bus routes that serve Los Altos, San Carlos, Woodside, Stanford Hills, and Burlingame. The school Caltrain shuttle routes provide service between the Palo Alto University Avenue Caltrain Station and campus and are timed based on the scheduled arrival (AM peak) and departure (PM peak) times. There are additional three shuttle routes that serve Menlo Park, East Palo Alto, Portola Valley.



Table 2: Castilleja School Morning Arrival Mode Share

Mode	Students ¹	Percent
Drop-Off	169	43%
<i>Single Student</i>	127	32%
<i>Carpool</i>	43	11%
Drive & park on Campus	23	6%
<i>Drive alone</i>	17	4%
<i>Carpool</i>	6	2%
Drive and Park on Street	0	0%
Walk	31	8%
Bike	43	11%
Shuttle / Bus	124	32%
Total	341	100%

Notes:

1. Average of student arrivals counted during the 7:00 AM – 9:00 AM arrival period and may be different than total enrollment on any given day.

Source: Fehr & Peers, 2022.

On average, approximately 8 percent of students entered the campus on foot and 11 percent of students rode bicycles to campus on the two monitoring days. Castilleja provides 100 bike parking spaces throughout the campus. The monitoring counts showed an average of 43 people who bike to school in the AM peak period therefore, the bike demand is below the school’s parking supply. The school also provides bicycle repair resources to encourage bicycle use and increase convenience.

PARKING OCCUPANCY

Peak parking demand typically occurs in the middle of the day, when the majority of faculty, staff, students, and visitors are on site. The staff and visitor parking lot on Bryant Street was at its highest occupancy (44 percent occupied) at 4:00 PM. The staff/utility parking lot on Kellogg was at its highest occupancy (87 percent occupied) at 2:00 PM. The student (senior) parking lot on Emerson Street reached was at its highest occupancy (94 percent occupied) at 12:00 PM.

Parking demand at the school was determined based on the combined peak occupancy of the three on-campus parking lots and street frontages bordering the school. The total number of parked vehicles (108 vehicles) was divided by the student enrollment (416 students) to determine the aggregate parking demand rate of 0.260 vehicle per student. **Table 3** summarizes parking demand



for both the on-campus and on-street spaces observed during this round of counts. The aggregate peak parking demand rate (on-campus and on-street) remains slightly below the rate in May 2012 (0.314 vehicle/student) when we first conducted the Castilleja parking counts.

On-street parking demand is currently evaluated for two data collection areas:

- Adjacent Streets (Frontages)– Counts are taken on Emerson Street between Embarcadero Road and Kellogg Avenue, on Kellogg Avenue between Emerson Street and Bryant Street, and on Bryant Street between Embarcadero Road and Kellogg Avenue. Parking occupancy on the blocks along the perimeter of the school is included in the demand estimate.
- Expanded Study – Counts for Melville Avenue, Waverley Street, and blocks of Kellogg Avenue, Emerson Street and Bryant Street between Alma Street, Waverley Street and Churchill Avenue were added to the data collection area.

The on-street parking demand rates include all vehicles parked on the side of the street closest to Castilleja School. No attempt is made to assess whether the parked vehicles are driven by Castilleja students, staff, or visitors. As a result, total parking and parking demand rates reflect the neighborhood’s general parking demand as well as demand generated by Castilleja School. **Figure 1** shows the block faces included in the parking occupancy and demand calculations (labeled *Adjacent Block Faces*).

Including the expanded study area (labeled *Expanded Study Area* on **Figure 1**), 144 vehicles were counted during the parking demand peak hour.

Table 3: Castilleja School Daily Peak Parking Demand¹

	On-Campus	On-Street	Aggregate
Parked Vehicles	60	49	108
Demand Rate – vehicles per student	0.194	0.117	0.311

Notes:

1. School parking lots and block faces adjacent to school

Source: Fehr & Peers, 2022

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- Adjacent Block Faces
- Expanded Study Area
- Castilleja High School
- Parks



Figure 1
Castilleja High School On-Street Parking



DAILY VEHICLE COUNTS

Data Collection

Daily vehicle trips were counted to establish baseline conditions considering that the City has proposed to do daily monitoring under Castilleja 2022 CUP. The data was collected via loop detectors over four weekdays: Wednesday, September 21, 2022; Thursday September 22, 2022; Tuesday October 4, 2022; and Thursday October 6, 2022, from 7:00 AM to 7:00 PM.

Daily vehicle counts were collected at the following seven Castilleja School driveways:

1. Bryant Street loop driveway,
2. Bryant Street Admin Lot driveway,
3. Emerson Street Senior Lot driveway,
4. Emerson Street exist only driveway,
5. Kellogg Avenue loop driveway,
6. Kellogg Avenue Staff Lot east driveway, and
7. Kellogg Avenue Staff Lot west driveway.

On each of the four weekdays, the number of vehicles entering and exiting each Castilleja driveway was recorded at 15-minute intervals. The average number of vehicles from the two other days were used for this time period in our analysis.

Daily Vehicle Count Results

Table 4 summarizes the total daily trips of all driveways recorded for each survey day and the three-day average value. **Figure 2** graphically presents the daily inbound (bottom) and outbound (top) vehicle trips for each survey day and the four-day average number of inbound and outbound vehicles.

The highest number of daily trips was recorded on Wednesday, September 21st (1,002 trips) while the lowest number of daily trips (970 trips) was recorded on both Tuesday, October 4th and Thursday October 6th. The four-day average value for the total daily trips is 985 which is below the 1,198 trips threshold. The four-day average number of daily inbound vehicle trips is 483 (51 percent of the daily total) and the four-day average number of daily outbound vehicle trips is 487 (49 percent of the daily total), which results in an approximately fifty-fifty split between inbound and outbound volume.

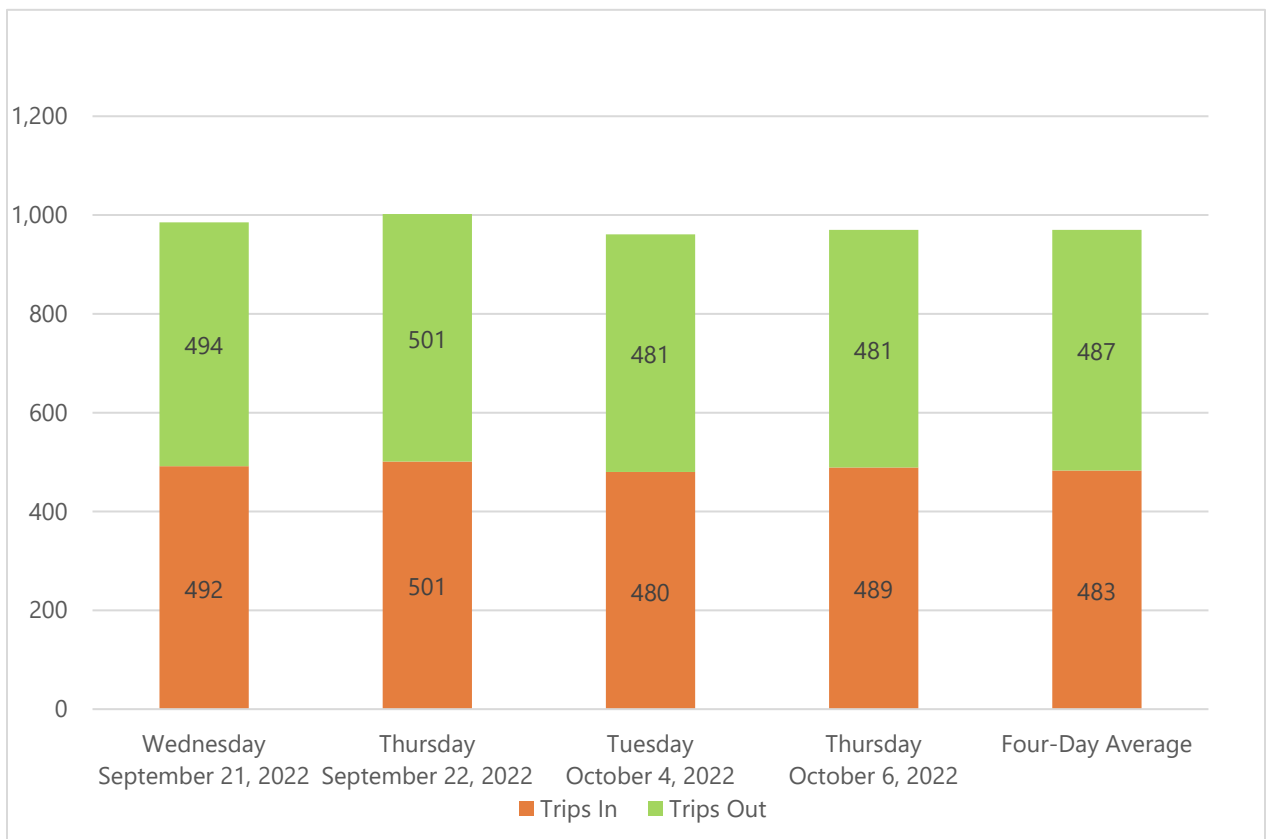


Table 4: Castilleja School Total Daily Trips by Survey Day and Four-Day Average

	Wednesday, Sept 21, 2022	Thursday, Sept 22, 2022	Tuesday, October 4, 2022	Thursday, October 6, 2022	Four-Day Average
Total Daily Trips	1,002	961	970	970	985

Source: Fehr & Peers, 2022.

Figure 2: Castilleja Daily Inbound & Outbound Vehicle by Survey Day and Four-Day Average



Source: Fehr & Peers, 2022.