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MEMORANDUM

Date: February 8, 2008

To: Rudy Nasol, San Jose/Evergreen Community College District

From: Jason Nesdahl, P.E.
Robert Eckols, P.E.

Subject: Existing Conditions for San Jose City College

SJ07-951

This memorandum documents the existing conditions of the roadway system surrounding San Jose City College and the campus parking demand during the Spring and Fall (Registration) 2007 semesters. Traffic counts were conducted on May 10, 2007 and September 25, 2007, when classes were in regular session. Parking occupancy counts were also conducted in May and 2007 when classes were in regular session, and during the first week of classes (registration) in September 2007.

San Jose City College is bordered by Moorpark Avenue to the north, Bascom Avenue to the west, Leigh Avenue to the east, and a residential neighborhood to the south. Access to the community college is provided by driveways on all four sides of the campus. Parking lots are located throughout campus, and several of these parking are connected via an internal roadway network.

ON-CAMPUS PARKING AND CIRCULATION

Fehr & Peers, in conjunction with Traffic Data Service, conducted a parking inventory and parking occupancy counts in May and September 2007. The existing parking facilities on the San Jose City College campus consist of several paved surface lots, one unpaved lot (which was later paved for the Fall semester), a four-story garage, and on-street parking along two internal roadways. The parking facilities are designated for specific uses (student, staff, etc.). Parking is available on the public roadways surrounding the campus, but on-street parking was not analyzed as part of this study.

Parking Inventory

Based on the initial inventory conducted in May 2007, there are approximately 1,750 parking spaces located on campus. Of these, approximately 1,200 are designated for students, 420 for staff, and 55 for the disabled. All parking space types and locations are listed in Table 1. The on-campus parking facilities are shown on Attachment A.

Modifications to Lots K and O were made for Fall 2007, and new Lot T was constructed. The Fall 2007 parking changes are outlined in Table 2.

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TABLE 1
EXISTING ON-SITE PARKING SUPPLY

Parking Designation	Number of Spaces						
	Student	Staff	Handicap	Motorcycle	School Vehicle	Short Term	Total
A	16	0	5	6	0	0	*27*
B	22	0	5	8	0	1	*36*
C	62	42	9	0	0	0	*113*
D[1]	30	0	0	0	0	0	*30*
E	0	78	8	0	0	0	*86*
F	0	27	4	0	5	0	*36*
G	13	31	3	0	7	0	*54*
H	0	61	1	0	8	0	*70*
I	347	3	2	0	0	3	*355*
J[2]	0	20	0	0	0	5	*25*
K	60	0	0	0	0	0	*60*
L	2	0	0	0	6	0	*8*
M	0	160	6	0	1	5	*172*
N[1]	0	0	0	0	3	0	*3*
O[3]	50	0	0	0	0	0	*50*
P	599	0	13	7	1	0	*620*
Q[1]	0	0	0	0	0	4	*4*
Total	***1,201***	***422***	***56***	***21***	***31***	***18***	***1,749***

Notes:

1 Spaces are not delineated by markings. The number of available spaces may vary.

2 Short-term spaces are not delineated by markings. The number of available spaces may vary.

3 Lot configuration and spaces are not delineated by markings. The number of available spaces is equal to the maximum number of parked vehicles observed during the parking occupancy counts.

Sources: Fehr & Peers, 2007; Traffic Data Service, 2007.

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TABLE 2
ON-SITE PARKING SUPPLY CHANGES FOR FALL 2007

Parking Designation	Number of Spaces			
	Student	Handicap	Total	Net Change
K	56	0	56	*-4*
O	97	4	101	*+51*
T	136	0	136	*+136*
Total	***289***	***4***	***293***	***+183***

Sources: Fehr & Peers, 2007; Traffic Data Service, 2007.

Parking Occupancy

Spring 2007 Semester

Parking occupancy counts were conducted for all on-campus facilities on Wednesday, May 9, and Thursday, May 17, 2007, to account for variations in class schedules. The counts were taken at half-hour intervals from 7:30 AM to 7:30 PM. Attachment B contains the parking counts.

The counts indicate that the parking facilities receive moderate use throughout the day beginning at 8:30 AM. The overall (two-day average) occupancy rates range from a low of 17 percent (301 spaces) at 7:30 AM to a high of 73 percent (1,278 spaces) at 11:30 AM. A smaller evening peak occurs at 7:00 PM when occupancy reaches 64 percent (1,117 spaces).

The overall occupancy rates of the student spaces mirror the total on-site parking occupancy rates. The rates range from a low of 15 percent (183 spaces) at 7:30 AM to a high of 77 percent (921 spaces) at 11:30 AM, with a rate of 71 percent (858 spaces) at 7:00 PM.

The overall occupancy rates of the staff spaces are similar to the total on-site parking occupancy rates. The rates range from a low of 23 percent (95 spaces) at 7:30 AM to a high of 72 percent (303 spaces) at 11:30 AM, with a rate of 50 percent (213 spaces) at 7:00 PM.

The total counts from the two survey days were compared to identify any notable differences between parking patterns. The parking patterns on the individual count dates generally correspond to the calculated two day average. There was a small difference in when the morning peak occurs. Peak demand was 75 percent (1,310 spaces) at 11:30 AM on May 9, while it was 72 percent (1,262 spaces) at 11:00 AM on May 17. This difference in the peak may be explained by differences in the class schedules on these two days. The occupancy percentages by day are illustrated on Figure 2.

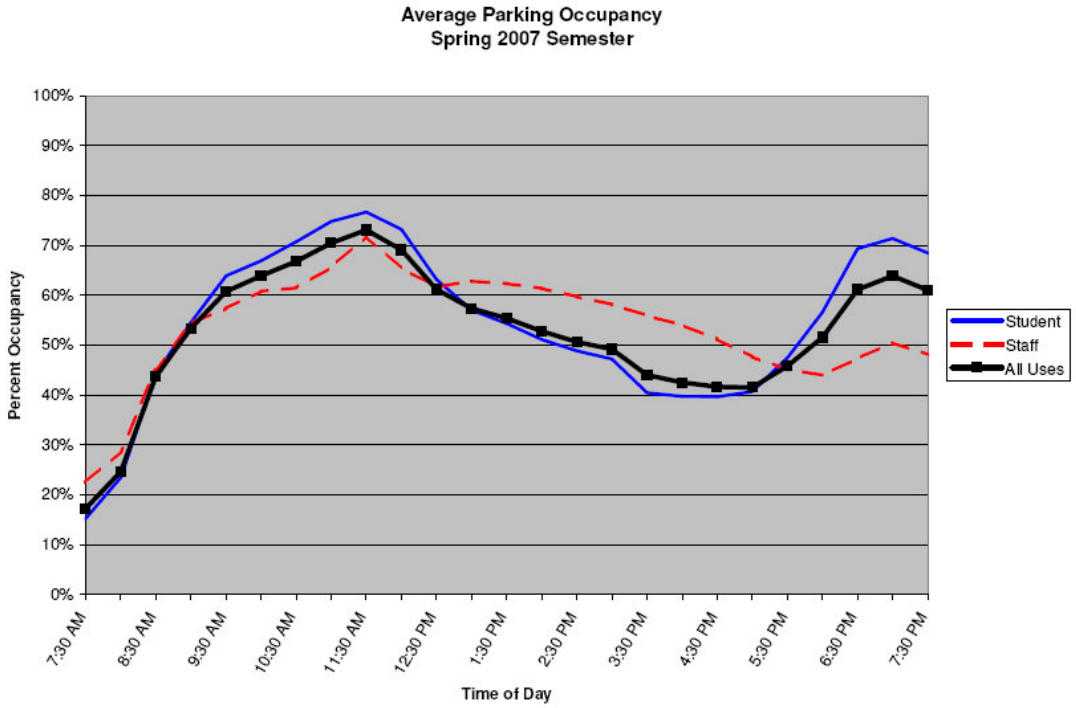

Figure 1 Parking Percent Occupied by Type of Space (Spring)

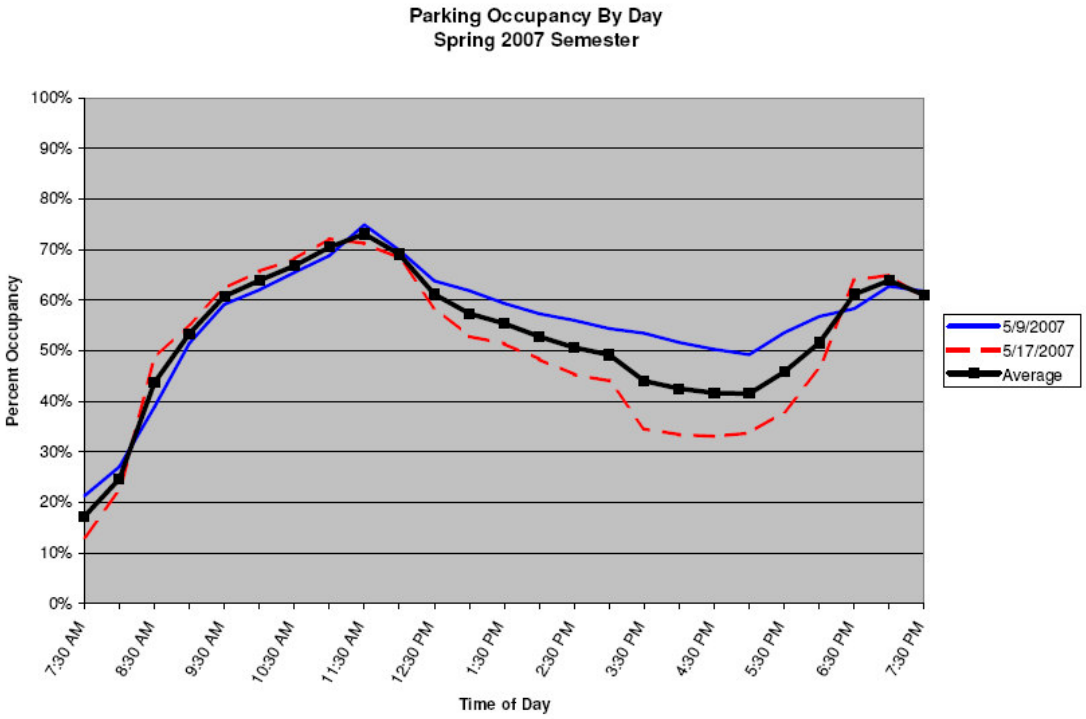

Figure 2 Parking Percent Occupied by Day (Spring)

Fall 2007 Semester (Registration)

Parking occupancy counts were also conducted for all on-campus facilities on Wednesday, September 4, 2007 and 5, 2007. This time period coincides with the registration time period for the Fall semester. The counts were taken at half-hour intervals from 7:30 AM to 7:30 PM. Attachment B contains the parking counts.

The counts indicate that the parking facilities receive moderate use throughout the day beginning at 8:30 AM. The overall (two-day average) occupancy rates range from a low of 23 percent (439 spaces) at 7:30 AM to a high of 93 percent (1,797 spaces) at 10:30 AM. A smaller evening peak occurs at 6:30 PM when occupancy reaches 87 percent (1,681 spaces).

The overall occupancy rates of the student spaces are similar to the total on-site parking occupancy rates. The rates range from a low of 23 percent (317 spaces) at 7:30 AM to a high of 98 percent (1,346 spaces) at 10:30 AM, with a rate of 71 percent (1,287 spaces) at 6:30 PM.

The overall occupancy rates of the staff spaces are similar to the total on-site parking occupancy rates. The rates range from a low of 22 percent (95 spaces) at 7:30 AM to a high of 90 percent (378 spaces) at 11:00 AM, with a rate of 81 percent (342 spaces) at 6:30 PM.

Figure 3 presents the overall occupancy percentages for all parking facilities, student spaces, and staff spaces throughout the day. The occupancy percentages by day are illustrated on Figure 4.

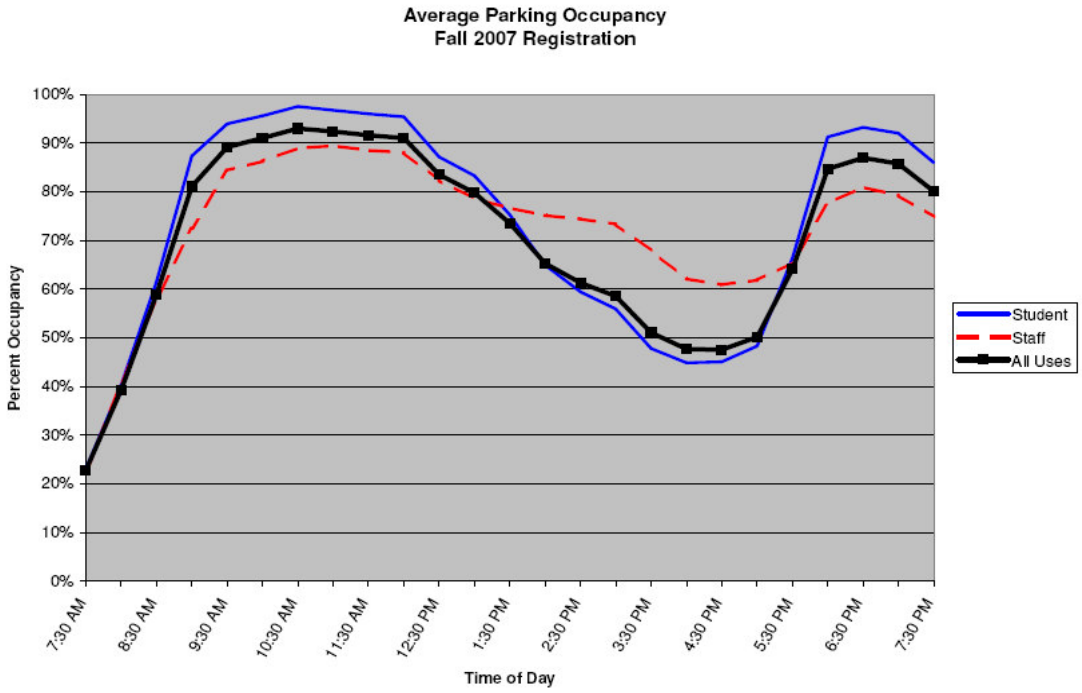

Figure 3 Parking Percent Occupied by Type (Fall Registration)

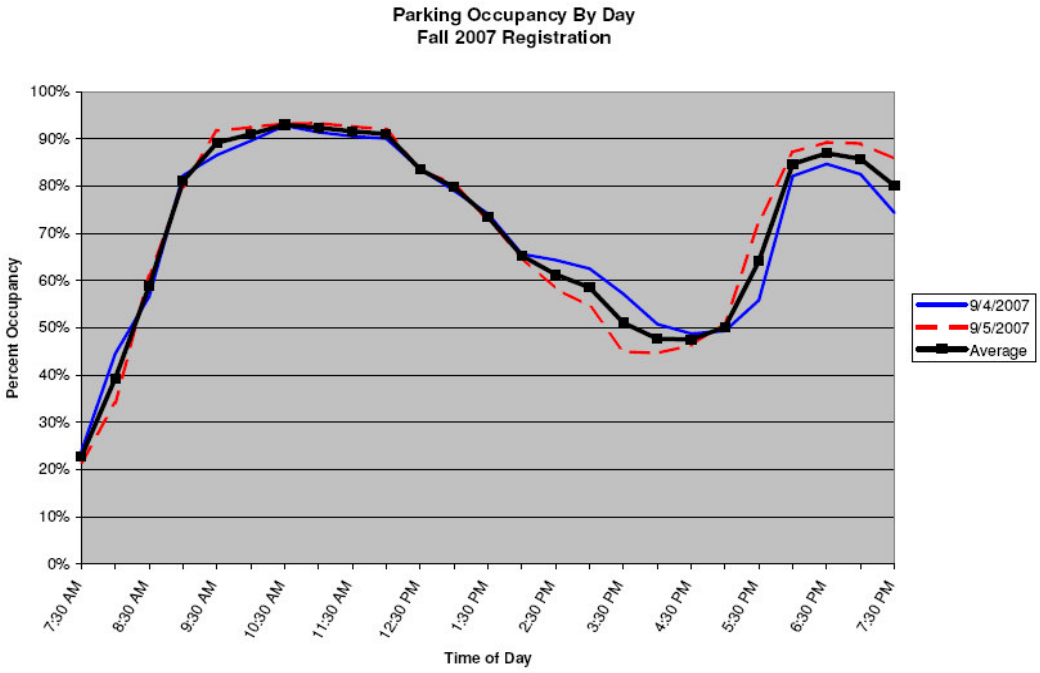

Figure 4 Parking Percent Occupied by Day (Fall Registration)

SURROUNDING ROADWAY SYSTEM

Existing conditions were analyzed for the roadway system surrounding San Jose City College. Level of service calculations were conducted for the primary intersections bordering the campus. Bicycle and pedestrian activity were measured at the same intersections.

Study Roadways

Bascom Avenue is a north-south, six-lane arterial roadway running along the west side of campus. *Leigh Avenue* is a north-south, four-lane arterial roadway running along the east side of campus. Leigh Avenue narrows to two lanes north of Parkmoor Avenue. *Leland Avenue* is a north-south, two-lane local roadway that terminates at Moorpark Avenue. *Moorpark Avenue* is a three-lane, one-way (west to east) arterial roadway running along the north side of campus. *Parkmoor Avenue* is a two-lane, one-way (east to west) arterial roadway running parallel to and immediately north of Moorpark Avenue. West of Bascom Avenue, Moorpark and Parkmoor Avenues carry traffic in both directions.

Intersection Analysis

Intersection operations were analyzed for the following seven (7) intersections:

1. Parkmoor Avenue and Bascom Avenue
2. Parkmoor Avenue and Leland Avenue

3. Moorpark Avenue and Bascom Avenue
4. Moorpark Avenue and Leland Avenue
5. Moorpark Avenue and Leigh Avenue
6. Leigh Avenue and San Jose City College Driveway
7. Bascom Avenue and Kingman Avenue

Level of Service Methods

The operations of roadway facilities are described with the term level of service (LOS). LOS is a qualitative description of traffic flow based on such factors as speed, travel time, delay, and freedom to maneuver. Six levels are defined from LOS A, with the best operating conditions, to LOS F, with the worst operating conditions. LOS E represents "at-capacity" operations. Operations are designated as LOS F when volumes exceed capacity, resulting in stop-and-go conditions.

The City of San Jose maintains a LOS D standard for intersections. The Valley Transportation Authority (VTA) requires a minimum standard for Congested Management Program (CMP) monitored intersections of LOS E.

Signalized Intersections

The level of service methodology approved by the City of San Jose and Valley Transportation Authority (VTA) analyzes a signalized intersection's operation based on average control vehicular delay using the method described in Chapter 16 of the *2000 Highway Capacity Manual* (*HCM*) by the Transportation Research Board, with adjusted saturation flow rates to reflect Santa Clara County conditions. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The average control delay for signalized intersections is calculated using TRAFFIX analysis software and correlated to a LOS designation as shown in Table 3.

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TABLE 3
SIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	≤ 10.0
B+	Operations with low delay occurring with good progression and/or short cycle lengths.	10.1 to 12.0
B		12.1 to 18.0
B-		18.1 to 20.0
C+	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.1 to 23.0
C		23.1 to 32.0
C-		32.1 to 35.0
D+	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 39.0
D		39.1 to 51.0
D-		51.1 to 55.0
E+	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	55.1 to 60.0
E		60.1 to 75.0
E-		75.1 to 80.0
F	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.	> 80.0

Sources: *Traffic Level of Service Analysis Guidelines*, VTA Congestion Management Program, June 2003; *Highway Capacity Manual*, Transportation Research Board, 2000.

Unsignalized Intersections

Operations of the unsignalized study intersections are evaluated using the method contained in Chapter 17 of the *2000 HCM* and calculated using TRAFFIX analysis software. LOS ratings for stop-sign controlled intersections are based on the average control delay expressed in seconds per vehicle. At two-way or side-street stop-controlled intersections, control delay is calculated for each movement, not for the intersection as a whole. For approaches composed of a single lane, control delay is computed as the average of all movements in that lane. For all-way stop-controlled locations, a weighted average delay for the entire intersection is presented. Table 4 summarizes the relationship between delay and LOS for unsignalized intersections.

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TABLE 4
UNSIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Little or no delay.	≤ 10.0
B	Short traffic delays.	10.1 to 15.0
C	Average traffic delays.	15.1 to 25.0
D	Long traffic delays.	25.1 to 35.0
E	Very long traffic delays.	35.1 to 50.0
F	Extreme traffic delays with intersection capacity exceeded.	> 50.0

Source: *Highway Capacity Manual*, Transportation Research Board, 2000.

Existing Intersection Volumes and Operations

The operations of the study intersections were evaluated for the highest one-hour volume during the weekday morning (AM) and afternoon (PM) peak periods. The AM and PM peak periods occur from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM, respectively. Operations were evaluated for the 7:45 to 8:45 AM and 5:00 to 6:00 PM peak hours because the highest overall traffic volumes exist during these peak hours.

New AM and PM peak-period turning movement counts were conducted at the study intersections on Tuesday, May 10, 2007, and Tuesday, September 25, 2007. The volumes were balanced through the intersections where necessary.

Existing intersection lane configurations, signal timings, and turning movement volumes were input to the TRAFFIX software program to calculate the levels of service. The results of the existing operations analysis are shown in Table 5. All study intersections currently operate at LOS D or better.

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TABLE 5
EXISTING INTERSECTION LEVELS OF SERVICE

Intersection	Stop Control	Peak Hour	Delay[1]	LOS[2]
1. Bascom Avenue and Parkmoor Avenue	Signal	AM PM	32.7 29.8	C- C
2. Parkmoor Avenue and Leland Avenue	Signal	AM PM	20.9 25.7	C+ C
3. Bascom Avenue and Moorpark Avenue*	Signal	AM PM	36.9 38.6	D+ D+
4. Moorpark Avenue and Leland Avenue	Signal	AM PM	7.1 7.2	A A
5. Moorpark Avenue and Leigh Avenue	Signal	AM PM	25.1 19.8	C B-
6. Leigh Avenue and San Jose City College Driveway[3]	Side-Street Stop	AM PM	9.2 13.5	A B
7. Bascom Avenue and Renova Drive[4]	Side-Street Stop	AM PM	15.8 33.2	C D

Notes:

1 Whole intersection weighted average control delay expressed in seconds per vehicle calculated using methods described in the *2000 HCM*, with adjusted saturation flow rates to reflect Santa Clara County Conditions. Total control delay for the worst movement is presented for side-street stop-controlled intersections.

2 LOS = Level of service. LOS calculations conducted using the TRAFFIX level of service analysis software package.

3 Delay and LOS for eastbound right-turn movement reported.

4 Delay and LOS for westbound approach reported.

* CMP intersection.

Peak-hour signal warrants[1] were conducted at the two unsignalized study intersections. The warrants are not met at either intersection.

[1] The use of peak-hour signal warrants is intended to examine the general correlation between the planned level of future development and the need to install new traffic signals. The traffic analysis presented in this document compares existing traffic volumes against a sub-set (peak-hour warrant) of the standard traffic signal warrants recommended in the Federal Highway Administration's *Manual on Uniform Traffic Control Devices* and associated State guidelines. This analysis should not serve as the only basis for deciding whether and when to install a signal. To reach such a decision, the full set of warrants should be investigated based on field-measured traffic conditions, collision data, and a thorough study of traffic and roadway conditions by an experienced engineer. The decision to install a signal should not be based solely upon the warrants because signals can lead to certain types of collisions.

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SUMMARY

Parking occupancy counts were performed for the San Jose City College campus during the Spring Semester (typical day) and Fall Semester (Registration) time periods. The peak parking demand for the typical spring semester day was 73% occurring at 11:30 am. During the Fall Registration period the peak parking demand on the campus was higher – 20% and occurred at 10:30 am.

The nearby intersections were also analyzed during the AM and PM peak hours. The results of the intersection level of service indicate that all study intersections are operating at acceptable levels of service.