FINAL REPORT #3

STANFORD UNIVERSITY 2004 TRAFFIC MONITORING REPORT

Prepared for:

Santa Clara County Department of Planning Development



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Prepared by:



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FOREWORD FROM THE COUNTY OF SANTA CLARA PLANNING OFFICE

Background

The purpose of this report is to compare traffic volumes entering and exiting Stanford campus during the inbound AM peak and the outbound PM commute peak to a traffic baseline. This comparison is completed on an annual basis. The requirements for establishment of the traffic baseline and performing annual comparisons to the baseline are contained within the December 2000 Stanford Community Plan/General Use Permit (GUP)/Environmental Impact Report (EIR) and within the 2000 Stanford General Use Permit. These documents can be reviewed at the County website or at the County Planning Office. Essentially, Stanford is required to attain a "no net new commute trip" standard as defined in the GUP and EIR.

The Process

Following the adoption of the GUP by the County Board of Supervisors in December 2000, the County Planning Office selected Korve Engineering (KORVE) to conduct the monitoring process outlined in the conditions of approval. Because of the type of data to be collected (particularly license plate numbers), the data could not be collected until after the start of daylight savings time in Spring 2001. The data collection involved three, 2-week periods in the Spring and one, 2-week period in the Fall 2001.

Condition of Approval G.7 outlines the process for establishing the baseline counts and for continuing monitoring in subsequent years. The process can be summarized as follows:

- Peak hour traffic is counted at least three times per year for a two-week period each time. The three counts shall be averaged to determine the annual traffic level.
- All counts are recorded at the 16 campus entry and exit points forming a cordon around the campus.
- License plate numbers are recorded for each entering and exiting vehicle to determine the amount of non-campus traffic.
- Cordon volumes are adjusted for parking lots within the cordon used by the hospital (these volumes are subtracted from the cordon line counts) and parking lots outside the cordon used by the university (these volumes are added to the cordon line counts).
- A peak hour is then established for the campus based on the counts, adjusted for cut through and parking lot location.

Board of Supervisors: Donald F. Gage, Blanca Alvarado, Pete McHugh, James T. Beall Jr., Liz Kniss **County Executive:** Peter Kutras, Jr.



Condition of Approval G.6 defines the peak commute directions as entering the campus in the morning peak commute period and leaving the campus in the evening commute period. The peak commute period is defined as the one-hour period of time between 7 AM and 9 AM and again between 4 PM and 6 PM with the highest volume of traffic, as defined by the counts. Therefore, the two peak hours are considered to be independent events. For example, an increase in AM peak traffic for two out of three years would trigger the additional elements of the monitoring program without a change, or even a decrease, in PM peak traffic, or the reverse. Also, a significant increase during one year in the AM and a sufficient increase in the PM for the following year would not trigger additional mitigation.

Activities Related to Traffic Baseline and Annual Monitoring Counts to Date

Stanford University Traffic Monitoring Report -- 2001 GUP Baseline

The 2001 Baseline Report was originally issued on July 3, 2002. An update to that report was issued on October 15, 2003. Per the provisions of the GUP, this original Traffic Baseline Report established the standard for measuring future traffic impacts to the "no net new commute" standard.

The following were the count dates of the 2001 Baseline Report:

- Week of April 2, 2001
- Week of April 9, 2001
- Week of April 23, 2001
- Week of April 30, 2001
- Week of May 7, 2001
- Week of May 14, 2001
- Week of October 22, 2001
- Week of October 29, 2001

The following were the results of the 2001 Baseline Monitoring:

| Inbound AM: | |
|------------------------------|---------|
| Average Count | 3,319 |
| 90% Confidence Interval | +/- 120 |
| Significant Traffic Increase | 3,439 |
| 1% Increase Trigger | 3,474 |



| Outbound PM: | |
|------------------------------|---------|
| Average | 3,446 |
| 90% Confidence Interval | +/- 109 |
| Significant Traffic Increase | 3,555 |
| 1% Trigger | 3,591 |

Stanford University Traffic Monitoring Report – 2002 Monitoring Report

The 2002 Monitoring Report was originally issued in July 2003. The count dates for the 2002 Monitoring Report were as follows:

- Week of April 15, 2002
- Week of April 22, 2002
- Week of April 29, 2002
- Week of May 6, 2002
- Week of May 13, 2002
- Week of May 20, 2002
- Week of October 14, 2002
- Week of October 21, 2002

The 2002 Monitoring Report concluded that the adjusted AM inbound count totaled 3,390 vehicles. This represented an increase of 71 vehicles, which fell within the 90% confidence interval and did not represent a significant AM inbound traffic increase. The PM outbound count totaled 3,678 vehicles which was an increase of 232 vehicles from the baseline, which was higher than the 90% confidence interval. This count exceeded the 1% trigger of 3,591 vehicles by 87. The following is a summary of the results of the 2002 Monitoring Report as contained in the July 2003 document.

| Inbound AM: | |
|--|---------|
| Adjusted Average 2002 Count | 3,390 |
| Baseline-established 90% Confidence Interval (2001) | +/- 120 |
| Baseline-established Significant Traffic Increase (2001) | 3,439 |
| Baseline-established 1% Increase Trigger (2001) | 3,474 |
| Result (Falls below the 1% Trigger by 84) | -84 |
| Outbound PM: | |
| Adjusted Average 2002 Count | 3,678 |
| Baseline-established 90% Confidence Interval (2001) | +/- 109 |
| Baseline-established Significant Traffic Increase (2001) | 3,555 |
| Baseline-established 1% Increase Trigger (2001) | 3,591 |
| Result (232 increase in vehicles exceeds the trigger by 87 vehicles) | +87 |
| | |



Adjustment 1 to 2002 Monitoring Report

An update to the original 2002 Monitoring Report was issued on October 15, 2003. Following the publication of the July 2003 report, Stanford and the County separately analyzed traffic data for the Stanford Homecoming Week. Based on consultation with Stanford and independent analysis of County consultant traffic data, the County determined that data collected for the week of Homecoming should not be included in the comparison data set. The rationale for this decision was that this event (Homecoming) had been ongoing for years, was not included in the baseline count, and would continue to be an annual event. The County communicated to Stanford that other future "large events" would not be excluded from future counts. The revised report substituted the week of October 28, 2002 for the previously counted week of October 14, 2002. The following are the results of the Revised 2002 Monitoring Report.

| Inbound AM: | |
|---|---------|
| Adjusted Average 2002 Count | 3,287 |
| Baseline-established 90% Confidence Interval (2001) | +/- 120 |
| Baseline-established Significant Traffic Increase (2001) | 3,439 |
| Baseline-established 1% Increase Trigger (2001) | 3,474 |
| Result (Falls below the 1% Trigger by 187) | -187 |
| Outbound PM: | |
| Adjusted Average 2002 Count | 3,598 |
| Baseline-established 90% Confidence Interval (2001) | +/- 109 |
| Baseline-established Significant Traffic Increase (2001) | 3,555 |
| Baseline-established 1% Increase Trigger (2001) | 3,591 |
| Result (152 increase in vehicles exceeds the trigger by 7 vehicles) | +7 |
| | |

Adjustment 2 to the 2002 Monitoring Report

Subsequent to the first adjustment to the 2002 Monitoring Report, Stanford informed the County that additional Marguerite shuttle runs had been introduced to campus since the completion of the baseline count, and thus counted in the Year 1 (2002) comparison counts. This resulted in an increase of 12 vehicles in each peak hour. County staff determined that these new bus lines should be subtracted from the comparison count. This provided an end result as follows:

| Inbound AM: | |
|--|---------|
| Adjusted Average 2002 Count | 3,275 |
| Baseline-established 90% Confidence Interval (2001) | +/- 120 |
| Baseline-established Significant Traffic Increase (2001) | 3,439 |
| Baseline-established 1% Increase Trigger (2001) | 3,474 |
| Result (Falls below the 1% Trigger by 199) | -199 |



| Outbound PM: | |
|--|---------|
| Adjusted Average 2002 Count | 3,586 |
| Baseline-established 90% Confidence Interval (2001) | +/- 109 |
| Baseline-established Significant Traffic Increase (2001) | 3,555 |
| Baseline-established 1% Increase Trigger (2001) | 3,591 |
| Result (Falls below the 1% Trigger by 5 vehicles) | -5 |

Stanford University Traffic Monitoring Report – 2003 Monitoring Report

This report represents the 2003 Monitoring Report. The count dates for the 2003 Monitoring Report were as follows:

• Week of April 7, 2003

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- Week of April 21, 2003
- Week of April 28, 2003
- Week of May 5, 2003
- Week of May 12, 2003
- Week of May 19, 2003
- Week of September 29, 2003
- Week of October 20, 2003

The 2003 Monitoring Report concluded that the adjusted AM inbound count totaled 3,413 vehicles. This represented an increase of 94 vehicles, which fell within the 90% confidence interval and did not represent a significant AM inbound traffic increase. The PM outbound count totaled 3,476 vehicles which was an increase of 30 vehicles from the baseline, which also fell within the 90% confidence interval. The following is a summary of the results of the 2003 Monitoring Report.

| Inbound AM: | |
|--|---------|
| Adjusted Average 2003 Count | 3,413 |
| Baseline-established 90% Confidence Interval (2001) | +/- 120 |
| Baseline-established Significant Traffic Increase (2001) | 3,439 |
| Baseline-established 1% Increase Trigger (2001) | 3,474 |
| Result (Falls below the 90% Confidence Interval by 26) | -26 |
| Result (Falls below the 1% Trigger by 61 vehicles) | -61 |
| Outbound PM: | |
| Adjusted Average 2003 Count | 3,476 |
| Baseline-established 90% Confidence Interval (2001) | +/- 109 |
| Baseline-established Significant Traffic Increase (2001) | 3,555 |
| Baseline-established 1% Increase Trigger (2001) | 3,591 |



| Result (Falls below the 90% Confidence Interval by 79 vehicles) | -79 |
|---|------|
| Result (Falls below the 1% Trigger by 115 vehicles) | -115 |

Stanford University Traffic Monitoring Report – 2004 Monitoring Report

This report represents the 2004 Monitoring Report. The count dates for the 2004 Monitoring Report were as follows:

- Week of April 12, 2004
- Week of April 19, 2004
- Week of April 26, 2004
- Week of May 3, 2004
- Week of May 10, 2004
- Week of May 17, 2004
- Week of September 27, 2004
- Week of October 4, 2004

The 2004 Monitoring Report concluded that the adjusted AM inbound count totaled 3,176 vehicles. This represented a decrease of 143 vehicles, which fell within the 90% confidence interval and did not represent a significant AM inbound traffic increase. The PM outbound count totaled 3,642 vehicles which was an increase of 196 vehicles from the baseline, which is 87 vehicles above 90% confidence interval and 51 vehicles more than the 1% established trigger. The following is a summary of the results of the initial 2004 Monitoring Report.

| Inbound AM: Adjusted Average 2004 Count Baseline-established 90% Confidence Interval (2001) Baseline-established Significant Traffic Increase (2001) Baseline-established 1% Increase Trigger (2001) Result (Falls below the 90% Confidence Interval by 263) | 3,176 +/- 120 3,439 3,474 -263 |
|---|--|
| Outbound PM: | -298 |
| Adjusted Average 2004 Count Basoline-ostablished 90% Confidence Interval (2001) | 3,642 |
| Baseline-established Significant Traffic Increase (2001) | 3.555 |
| Baseline-established 1% Increase Trigger (2001) | 3,591 |
| Result (Falls above the 90% Confidence Interval by 87 vehicles) | +87 |
| Result (Falls above the 1% Trigger by 51 vehicles) | +51 |



The 2000 Stanford GUP Condition G.8 specifies that the County will recognize and "credit" Stanford off-campus trip reduction efforts within defined geographic boundaries. These credits will be applied to Stanford's attainment of the "no net new commute trip" standard. In 2003, Stanford and the County discussed potential methodologies for providing credits to Stanford. The County developed draft guidelines, which were reviewed by the Community Resource Group, and the Planning Office approved the final guidelines on October 9, 2003. These guidelines are presented in the "Stanford Traffic Cordon Count Credit Guidelines" dated October 28, 2003.

On March 2, 2005, Stanford submitted a 2004 trip credit report that was reviewed by Korve Engineering. This report documented a credit of 66 trips for the increase in the number of bus trips across the cordon points and the number of transit passengers served outside the cordon area in the PM peak hour between the 2001 baseline and 2004. Using the new Marguerite shuttle Automated Transportation Management System, the number of passengers getting on and off the shuttle at each stop was counted. Most of the trip credits claimed are for passengers (primarily Stanford Hospital employees) getting on the shuttle outside the cordon area and traveling to the Palo Alto Caltrain station. As outlined in the adopted guidelines, full credits are claimed for trips in the peak commute direction and 1/3 credit claimed for trips in the reverse direction. Pass through credits are claimed for those passengers who board outside the cordon, pass through the campus, and then alight outside the campus based on onboard surveys. As summarized below, with the trip credit of 66 trips Stanford did not exceed the no net new commute trip standard based on the 2004 monitoring program.

Outbound PM:

| Adjusted Average 2004 Count | 3,642 |
|---|---------|
| Baseline-established 90% Confidence Interval (2001) | +/- 109 |
| Baseline-established Significant Traffic Increase (2001) | 3,555 |
| Baseline-established 1% Increase Trigger (2001) | 3,591 |
| Result (Falls above the 90% Confidence Interval by 87 vehicles) | +87 |
| Result (Falls above the 1% Trigger by 51 vehicles) | +51 |
| 2004 Trip Credit | -66 |
| Result With Trip Credit (Falls below the 1% Trigger by 15 vehicles) | -15 |

County of Santa Clara

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INTRODUCTION

This report presents the traffic and parking data that has been collected at Stanford University by Korve Engineering during the Spring and Fall monitoring periods of 2004. Traffic volumes were collected for six weeks during the Spring and two weeks during the Fall. The Spring counts were conducted the weeks of April 12, April 19, April 26, May 3, May 10, and May 17. The Fall counts were conducted for the weeks of September 27 and October 4. The data include vehicle counts at all of the access points to the campus and parking lots. Parking lot counts and cut-through percentages were used to adjust the raw traffic counts in order to determine the total amount of peak hour traffic generated by Stanford University. The parking data were used to add in campus traffic that park outside of the count area and subtract out hospital traffic from parking inside the count area. License plate surveys were used to calculate the amount of traffic that cuts through the campus and thus is not University-generated traffic. Data collection methodology is described in greater detail in Task 1. A description of the data analysis procedures is presented in Task 2. The data collected in calendar year 2004 is compared to the baseline counts collected in calendar year 2001. Differences between the two years are then analyzed to determine if traffic is increasing to a significant degree.

Task 1.0 Traffic Monitoring Data Collection Methodology

Data collection is a critical component of the traffic monitoring program. The following work elements were conducted to collect all relevant traffic data for the monitoring program.

Task 1.1 Machine Cordon Line Traffic Counts

Directional traffic counts were collected at Stanford University for eight weeks in 2004 on each of the 16 roadways that provide access to and from the campus. The location of the 16 cordon counts are listed below and shown graphically in Figures 1 and 2.

- 1. Campus Drive West, north of Junipero Serra Boulevard
- 2. Stock Farm Road, east of Sand Hill Road
- 3. Welch Road, north of Oak Road
- 4. Quarry Road, north of Campus Drive West
- 5. Palm Drive, south of Arboretum Road
- 6. Lasuen Street, south of Arboretum Road
- 7. Galvez Street, south of Arboretum Road
- 8. Serra Street, southwest of El Camino Real
- 9. Yale Street, west of Stanford Avenue
- 10. Wellesley Street, west of Stanford Avenue
- 11. Oberlin Street, west of Stanford Avenue
- 12. Olmsted Road, north of Escondido Road
- 13. Bowdoin Street, west of Stanford Avenue
- 14. Raimundo Way, west of Stanford Avenue
- 15. Santa Maria Avenue, north of Junipero Serra Boulevard
- 16. Campus Drive East, east of Junipero Serra Boulevard



Cordon Count Locations

- 1. Campus Drive West north of \Box
- □ Junipero Serra Blvd.□
- 2. Stock Farm Road east of Sand Hill Road
- 3. Welch Road north of Oak Road
- 4. Quarry Road north of Campus Drive
- 5. Palm Drive south of Arboretum Road
- 6. Lasuen Street south of Arboretum Road
- 7. Galvez Street south of Arboretum Road
- 8. Serra Street southwest of El Camino Real
- 9. Yale Street west of Stanford Avenue
- 10. Wellesley Street west of Stanford Avenue
- 11. Oberlin Street west of Stanford Avenue
- 12. Olmsted Road north of Escondido Road
- 13. Bowdoin west of Stanford Avenue
- 14. Raimundo west of Stanford Avenue
- 15. Santa Maria Avenue north of □ Junipero Serra Blvd.
- 16. Campus Drive East east of □ Junipero Serra Blvd.

NOTES

License plate survey for Location 1 and Location 16 shifted for more accurate recording. Cordon tube counts continued at campus boundary.

Escondido Drive no longer continuous street from Campus Drive East to Stanford Avenue.

STANFORD UNIVERSITY TRAFFIC MONITORING REPORT

Figure 1 DAILY MACHINE CORDON COUNT LOCATIONS

Engineering

Figure 2 **Daily Machine Cordon Count Locations**

The detailed traffic counts at the 16 cordon locations are presented in Appendix A and are summarized in Table 1. Table 1 shows the AM inbound and PM outbound peak hour volumes for each day that traffic was monitored. As indicated in Table 1, the AM peak hour usually occurred from 7:45 to 8:45 and the PM peak hour generally occurred between 5:00 to 6:00. The unadjusted AM inbound traffic volumes ranged from a low of 3,902 on Friday, May 21 to a high of 4,423 on Thursday, September 30. The PM peak hour traffic volumes ranged from a low of 4,400 on Monday, May 17 to a high of 4,971 on Thursday, April 29.

Task 1.2 Parking Lot Driveway Counts

There are two parking lots (L1 – Rectangle Lot and L2 – Quarry Lot) outside the cordon line that serve some campus uses. There are also several parking lots (L3, L4 – Beckman Lot, L5 – Stock Farm Road Lot, and L6) along with parking structures 1 (PS1) and 3 (PS3) that are inside the established cordon line that serve some hospital uses. Traffic was counted by direction into and out of these parking lots during the entire count period. The detailed count sheets for the driveway traffic at these lots are included in Appendix B.

The driveway count locations are presented below and in Figure 3.

- 1. PS1a Parking Structure 1 North Access to Campus Drive
- 2. PS1b Parking Structure 1 South Access to Roth Way
- 3. PS3a Parking Structure 3 Northwest Access
- 4. PS3b Parking Structure 3 Northeast Access
- 5. L1a Rectangle Lot (Lot 1) Quarry Road Access
- 6. L1b Rectangle Lot (Lot 1) North Access
- 7. L2a Quarry Lot (Lot 2) North Access to Quarry Road
- 8. L2b Quarry Lot (Lot 2) Middle Access to Quarry Road
- 9. L2c Quarry Lot (Lot 2) South Access to Quarry Road
- 10. L3a Near Medical Drive, west of Campus Drive
- 11. L4a Driveway to Lot 4 from Campus Drive West
- 12. L5a West Driveway to Lot 5 from Oak Road
- 13. L5b Center Driveway to Lot 5 from Oak Road
- 14. L5c East Driveway to Lot 5 from Oak Road
- 15. L5d East Driveway to Lot 5 from Stock Farm Road
- 16. L5e West Driveway to Lot 5 from Stock Farm Road
- 17. L6a West Driveway to Lot 6 from Oak Road
- 18. L6b South Driveway to Lot 6 from Stockfarm Road

| Data | AM Inbound | | PM Outbound | | | |
|------------------------------|------------------|--------|--------------|------------------|--------|----------------|
| Date | Weather | Volume | Period | Weather | Volume | Period |
| Week 1 | | | | | | |
| April 12,2004 | Mostly Cloudy | 4089 | 7:45 to 8:45 | Scattered Clouds | 4492 | 5:00 to 6:00 |
| April 13, 2004 | Mostly Cloudy | 4233 | 7:45 to 8:45 | Scattered Clouds | 4582 | 5:00 to 6:00 |
| April 14, 2004 | Mostly Cloudy | 4217 | 7:45 to 8:45 | Scattered Clouds | 4645 | 5:00 to 6:00 |
| April 15, 2004 | Mostly Cloudy | 4157 | 7:45 to 8:45 | Mostly Cloudy | 4664 | 4:45 to 5:45 |
| April 16, 2004 | Mostly Cloudy | 4002 | 7:45 to 8:45 | Mostly Cloudy | 4716 | 5:00 to 6:00 |
| Week 2 | | | | | | |
| April 19, 2004 | Overcast | 4082 | 7:45 to 8:45 | Overcast | 4503 | 5:00 to 6:00 |
| April 20, 2004 | Overcast | 4074 | 7:45 to 8:45 | Mostly Cloudy | 4649 | 5:00 to 6:00 |
| April 21, 2004 | Overcast | 4163 | 7:45 to 8:45 | Mostly Cloudy | 4596 | 5:00 to 6:00 |
| April 22, 2004 | Clear | 4156 | 7:45 to 8:45 | Clear | 4858 | 5:00 to 6:00 |
| April 23, 2004 | Mostly Cloudy | 3973 | 7:45 to 8:45 | Partly Cloudy | 4608 | 4:45 to 5:45 |
| Week 3 | | | | | | |
| April 26, 2004 | Mostly Cloudy | 4099 | 7:45 to 8:45 | Partly Cloudy | 4523 | 5:00 to 6:00 |
| April 27, 2004 | Clear | 4221 | 7:45 to 8:45 | Clear | 4681 | 5:00 to 6:00 |
| April 28, 2004 | Cloudy | 4252 | 7:45 to 8:45 | Clear | 4771 | 5:00 to 6:00 |
| April 29, 2004 | Clear | 4332 | 7.45 to 8.45 | Scattered Clouds | 4971 | 5.00 to 6.00 |
| April 30, 2004 | Scattered Clouds | 4015 | 7.45 to 8.45 | Partly Cloudy | 4753 | 4.45 to 5.45 |
| Week 4 | | 1010 | | i and oround | | |
| May 3 2004 | Clear | 4232 | 7.45 to 8.45 | Clear | 4609 | 4.45 to 5.45 |
| May 4, 2004 | Clear | 4271 | 7:45 to 8:45 | Clear | 4550 | 5.00 to 6.00 |
| May 5, 2004 | Clear | 4197 | 7:45 to 8:45 | Clear | 4681 | 5.00 to 6.00 |
| May 6, 2004 | Mostly Cloudy | 4350 | 7:45 to 8:45 | Mostly Cloudy | 4701 | 5.00 to 6.00 |
| May 7 2004 | Scattered Clouds | 4046 | 7.45 to 8.45 | Scattered Clouds | 4863 | 5.00 to 6.00 |
| Week 5 | | 1010 | | | 1000 | |
| May 10, 2004 | Scattered Clouds | 4171 | 7.45 to 8.45 | Partly Cloudy | 4447 | 5.00 to 6.00 |
| May 10, 2001 May 11, 2004 | Partly Cloudy | 4411 | 7:45 to 8:45 | Partly Cloudy | 4788 | 4.45 to 5.45 |
| May 12 2004 | Clear | 4249 | 7.45 to 8.45 | Clear | 4724 | 5.00 to 6.00 |
| May 13, 2004 | Cloudy | 4224 | 7.45 to 8.45 | Partly Cloudy | 4713 | 4.45 to 5.45 |
| May 14, 2004 | Scattered Clouds | 3972 | 7:45 to 8:45 | Partly Cloudy | 4425 | 4:30 to 5:30 |
| Week 6 | | | | | | |
| May 17 2004 | Overcast | 4131 | 7.45 to 8.45 | Mostly Cloudy | 4400 | 4.30 to 5.30 |
| May 18, 2004 | Mostly Cloudy | 4296 | 7:45 to 8:45 | Mostly Cloudy | 4591 | 5:00 to 6:00 |
| May 19, 2004 | Clear | 4200 | 7:45 to 8:45 | Partly Cloudy | 4915 | 4:45 to 5:45 |
| May 20, 2004 | Overcast | 4073 | 7:45 to 8:45 | Scattered Clouds | 4900 | 4:45 to 5:45 |
| May 21, 2004 | Overcast | 3902 | 7:45 to 8:45 | Scattered Clouds | 4671 | 4:30 to 5:30 |
| Week 7 | | | | | | |
| Sep 27, 2004 | Scattered Clouds | 4305 | 7:45 to 8:45 | Scattered Clouds | 4740 | 4:45 to 5:45 |
| Sep 28, 2004 | Mostly Cloudy | 4399 | 8:00 to 9:00 | Partly Cloudy | 4772 | 4:45 to 5:45 |
| Sep 29, 2004 | Mostly Cloudy | 4395 | 8:00 to 9:00 | Partly Cloudy | 4676 | 4:45 to 5:45 |
| Sep 30, 2004 | Mostly Cloudy | 4423 | 7:45 to 8:45 | Partly Cloudy | 4870 | 5:00 to 6:00 |
| Oct 1, 2004 | Overcast | 4207 | 8:00 to 9:00 | Clear | 4474 | 4:45 to 5:45 |
| | | | | | | |
| Week 8 | | | | | | |
| Oct 4. 2004 | Overcast | 4338 | 7:45 to 8:45 | Partly Cloudy | 4403 | 4:45 to 5:45 |
| Oct 5, 2004 | Overcast | 4406 | 7:45 to 8:45 | Scattered Clouds | 4800 | 5:00 to 6:00 |
| Oct 6, 2004 | Mostly Cloudy | 4262 | 8:00 to 9:00 | Scattered Clouds | 4524 | 5:00 to 6:00 |
| Oct 7, 2004 | Mostly Cloudy | 4294 | 7:45 to 8:45 | Partly Cloudy | 4466 | 4:45 to 5:45 |
| Oct 8, 2004 | Mostly Cloudy | 3934 | 7:45 to 8:45 | Scattered Clouds | 4547 | 5:00 to 6:00 |
| | | | | | | |

Table 12004 Raw Traffic Count Summary

DRIVEWAY AND PARKING COUNT LOCATIONS

Hospital trips from parking lots inside the cordon line were subtracted from the cordon counts, while campus trips from lots outside the cordon line were added to the raw counts. This was done to properly identify all trips generated by Stanford University and not by other adjacent land uses, particularly the medical complex.

Task 1.3 Parking Permit Scanning/Count

At the beginning and end of both the morning and evening peak period, the number of vehicles in each of the lots identified in Figure 3 was counted. Each vehicle permit was also scanned to determine if it was related to campus or hospital uses. Both Campus and Medical related parking stickers were Blue, Orange or Grey in color with white lettering. During the counts, Medical Center vehicles were identified by a windshield sticker stating hospital on the bottom right hand corner. Campus vehicles were identified by the windshield sticker stating Campus on the bottom right hand corner.

On-street parking on Oak Road between Stock Farm Road and Welch Road, and on Welch Road between Campus Drive West and the cordon station just north of Oak Road was counted and classified in the same manner as described above. Since these on-street parking facilities are located within the cordon line, hospital vehicles were subtracted out of the cordon count and no adjustment was made to add in campus trips. The parking lot and on-street parking occupancy data is included in Appendix B along with the parking counts.

Korve Engineering used the traffic counts in Task 1.1 and the parking counts in Tasks 1.2 and 1.3 to adjust the raw traffic counts. If campus parking permits were observed in lots outside the cordon area, they were added back into the cordon count. If hospital trips were observed inside the cordon area, they were subtracted from the cordon count. All vehicles without a parking permit were assumed to be campus trips.

Task 1.4 License Plate Survey

The purpose of the license plate survey was to identify vehicles that are only passing through the Stanford campus, not beginning or ending their trip there. License plate numbers were recorded for vehicles entering and leaving each cordon location. Vehicles that entered the cordon and left within a period of 15 minutes were considered to be "cut-through" vehicles. Surveys were done during one day each week for both of the peak hours. The license plate matching process showed that during the Spring counts the AM and PM cut-through percentages were 14.14% and 18.55%, respectively. During the Fall count period, the AM cut-through percentage was 15.53%, while the PM was 17.47%. The Spring and Fall percentages were used to adjust their respective vehicle counts.

Task 2.0 Traffic Monitoring Data Analysis

Task 2.1 Daily Cordon Count Spreadsheets

First, the raw cordon count numbers were entered into spreadsheets. Two spreadsheets – one for the AM peak period and one for the PM peak period – were

created for each weekday that a cordon count was conducted. Each spreadsheet shows the AM inbound and PM outbound vehicles passing all 16 cordon locations during five hourly increments. For the AM peak, the hours were 7:00-8:00, 7:15-8:15, 7:30-8:30, 7:45-8:45, and 8:00-9:00. For the PM peak, the hours were 4:00-500, 4:15-5:15, 4:30-5:30, 4:45-5:45, and 5:00-6:00. Since cordon counts were collected for eight weeks, there are a total of 80 daily cordon count spreadsheets (40 AM and 40 PM). These sheets are included in Appendix C of this report.

Task 2.2Daily Parking Spreadsheets

The number of vehicles coming in and out of the parking lots in the vicinity of the Stanford Medical Center was also monitored during the eight-week period. The AM inbound and PM outbound volumes at all lot entrances were entered into spreadsheets for the AM and PM peak periods of each day just as described for the cordon counts in Task 2.1. All 80 daily parking spreadsheets are included in Appendix D.

Task 2.3 Adjustments For Parking and Cut-Through Vehicles

The parking sticker counts performed at the lots were used to compute the percentage of campus and hospital vehicles present in each lot during the AM and PM peak hours. Since a sticker survey was done at the beginning and end of each two-hour peak period count, the two values for every lot were averaged. Sticker surveys were completed for both peak hours of one day during each week.

The parking lot AM inbound and PM outbound volumes were used along with the averaged campus and hospital vehicle percentages in order to adjust the cordon count spreadsheets. Since Lots 1 and 2 are outside of the cordon boundary, some campus-related vehicles will park in those lots and not get counted in the cordon count. To add them in, the average percentage of campus vehicles in those lots was multiplied by the AM inbound and PM outbound volumes at each corresponding lot entrance (from Task 2.2), and then added to the cordon counts.

Lots 3, 4, 5, and 6, as well as the two parking structures (PS-1 and PS-3) are located inside the cordon boundary. Thus, hospital-related vehicles parking in these lots need to be subtracted out of the cordon counts. To do this, the average percentage of hospital-related vehicles was multiplied by the AM inbound and PM outbound volumes at each respective lot entrance (from Task 2.2), and then subtracted from the cordon counts.

A parking sticker survey was also conducted at two on-street locations during the same days as the surveys for the parking lots. The streets surveyed were Oak Road and the portion of Welch Road between Campus Drive West and the cordon location just north of Oak Road. Since both streets were inside the cordon, only the hospital vehicles were of importance. If more hospital vehicles were present at the end of the period than at the beginning, the change in vehicles was subtracted from the inbound totals for that period. If fewer hospital vehicles were present at the end of the period, the difference was subtracted from the outbound totals.

| Date | AM Inbound | | PM Ou | tbound |
|--|--------------------------------------|--|--------------------------------------|--|
| | volume | Period | voiume | Period |
| Week 1 April 12,2004 April 13, 2004 April 14, 2004 April 15, 2004 | 3061 3177 3106 3091 | 7:45 to 8:45 7:45 to 8:45 7:45 to 8:45 7:45 to 8:45 7:45 to 8:45 | 3459 3508 3535 3574 | 5:00 to 6:00 5:00 to 6:00 5:00 to 6:00 4:45 to 5:45 |
| April 16, 2004 | 2930 | 7:45 to 8:45 | 3608 | 5:00 to 6:00 |
| Week 2 April 19, 2004 April 20, 2004 April 21, 2004 April 22, 2004 April 23, 2004 | 3113 3084 3116 3110 3025 | 7:45 to 8:45 7:45 to 8:45 7:45 to 8:45 7:45 to 8:45 7:45 to 8:45 7:45 to 8:45 | 3546 3682 3614 3823 3645 | 5:00 to 6:00 5:00 to 6:00 5:00 to 6:00 5:00 to 6:00 4:45 to 5:45 |
| Week 3 April 26, 2004 April 27, 2004 April 28, 2004 April 29, 2004 April 30, 2004 | 3129 3231 3251 3319 3083 | 7:45 to 8:45 7:45 to 8:45 7:45 to 8:45 7:45 to 8:45 7:45 to 8:45 7:45 to 8:45 | 3558 3690 3737 3902 3698 | 5:00 to 6:00 5:00 to 6:00 5:00 to 6:00 5:00 to 6:00 4:45 to 5:45 |
| Week 4 May 3, 2004 May 4, 2004 May 5, 2004 May 6, 2004 May 7, 2004 | 3201 3236 3153 3285 3000 | 7:45 to 8:45 7:45 to 8:45 7:45 to 8:45 7:45 to 8:45 7:45 to 8:45 7:45 to 8:45 | 3543 3502 3584 3605 3749 | 4:45 to 5:45 5:00 to 6:00 5:00 to 6:00 5:00 to 6:00 5:00 to 6:00 |
| Week 5 May 10, 2004 May 11. 2004 May 12, 2004 May 13, 2004 May 14, 2004 | 3101 3299 3197 3194 3001 | 7:45 to 8:45 7:45 to 8:45 7:45 to 8:45 7:45 to 8:45 7:45 to 8:45 7:45 to 8:45 | 3351 3620 3605 3589 3390 | 5:00 to 6:00 4:45 to 5:45 5:00 to 6:00 4:45 to 5:45 4:30 to 5:30 |
| Week 6 May 17, 2004 May 18, 2004 May 19, 2004 May 20, 2004 May 21, 2004 | 3156 3273 3213 3094 2948 | 7:45 to 8:45 7:45 to 8:45 7:45 to 8:45 7:45 to 8:45 7:45 to 8:45 7:45 to 8:45 | 3414 3561 3806 3846 3654 | 4:30 to 5:30 5:00 to 6:00 4:45 to 5:45 4:45 to 5:45 4:30 to 5:30 |
| Week 7 Sep 27, 2004 Sep 28, 2004 Sep 29, 2004 Sep 30, 2004 Oct 1, 2004 | 3279 3370 3372 3399 3219 | 7:45 to 8:45 8:00 to 9:00 8:00 to 9:00 7:45 to 8:45 8:00 to 9:00 | 3829 3804 3770 3911 3585 | 4:45 to 5:45 4:45 to 5:45 4:45 to 5:45 5:00 to 6:00 4:45 to 5:45 |
| Week 8 Oct 4, 2004 Oct 5, 2004 Oct 6, 2004 Oct 7, 2004 Oct 8, 2004 | 3327 3370 3259 3258 2991 | 7:45 to 8:45 7:45 to 8:45 8:00 to 9:00 7:45 to 8:45 7:45 to 8:45 | 3564 3887 3666 3632 3648 | 4:45 to 5:45 5:00 to 6:00 5:00 to 6:00 4:45 to 5:45 5:00 to 6:00 |
| Average | 3176 | | 3642 | |

 Table 2
 2004 Adjusted Traffic Totals

| Volume Period Volume Period Week 1 3036 7:45 to 8:45 3323 5:00 to 6:00 April 3, 2001 3059 7:45 to 8:45 3228 4:45 to 5:45 April 4, 2001 2884 8:00 to 9:00 3334 4:45 to 5:45 April 6, 2001 2610 8:00 to 9:00 3329 5:00 to 6:00 April 9, 2001 3265 8:00 to 9:00 3329 5:00 to 6:00 April 10, 2001 3107 8:00 to 9:00 3473 4:45 to 5:45 April 13, 2001 2973 8:00 to 9:00 3413 4:45 to 5:45 Meek 3 April 24, 2001 3322 7:45 to 8:45 3281 5:00 to 6:00 April 24, 2001 3322 7:45 to 8:45 3281 5:00 to 6:00 April 24, 2001 3225 7:45 to 8:45 3286 5:00 to 6:00 April 24, 2001 3226 7:45 to 8:45 3286 5:00 to 6:00 April 25, 2001 3129 7:45 to 8:45 3286 5:00 to 6:00 April 30, 2001 2622 | Date | AM Inbound | | PM Outbound | |
|---|-------------------------|------------|--------------|-------------|--------------|
| Week 1 South 1 South 2 South 2 South 2 April 3, 2001 3059 7:45 to 8:45 3223 4:45 to 5:45 April 4, 2001 2884 8:00 to 9:00 3334 4:45 to 5:45 April 5, 2001 2001 2610 8:00 to 9:00 3092 4:45 to 5:45 Week 2 April 9, 2001 3265 8:00 to 9:00 3322 5:00 to 6:00 April 9, 2001 3141 8:00 to 9:00 3322 5:00 to 6:00 April 12, 2001 3081 8:00 to 9:00 3473 4:45 to 5:45 Week 3 April 12, 2001 3081 8:00 to 9:00 3413 4:45 to 5:45 Week 3 April 22, 2001 3225 7:45 to 8:45 3281 5:00 to 6:00 April 23, 2001 32285 7:45 to 8:45 3281 5:00 to 6:00 5:45 Week 3 April 27, 2001 3129 7:45 to 8:45 3281 5:00 to 6:00 April 27, 2001 2723 8:00 to 9:00 3154 4:45 to 5:45 May 1, 2001 2862 | | Volum | e Period | Volume | Period |
| April 2, 2001 3036 7.45 to 8:45 3323 5:00 to 6:00 April 3, 2001 3059 7.45 to 8:45 3226 4:45 to 5:45 April 4, 2001 2884 8:00 to 9:00 3334 4:45 to 5:45 April 5, 2001 22610 8:00 to 9:00 3329 5:00 to 6:00 April 9, 2001 3265 8:00 to 9:00 3329 5:00 to 6:00 April 10, 2001 3107 8:00 to 9:00 3473 4:45 to 5:45 April 12, 2001 3081 8:00 to 9:00 3473 4:45 to 5:45 April 22, 2001 3081 8:00 to 9:00 3473 4:45 to 5:45 April 22, 2001 3225 7:45 to 8:45 3211 4:30 to 5:30 April 24, 2001 3225 7:45 to 8:45 3214 4:45 to 5:45 April 30, 2001 3226 7:30 to 8:30 3226 4:45 to 5:45 April 30, 2001 22502 7:30 to 8:30 3226 4:45 to 5:45 April 30, 2001 2826 7:45 to 8:45 2967 5:00 to 6:00 May 7, 2001 | Week 1 | | | | |
| April 3, 2001 3059 7:45 to 8:45 3285 4:45 to 5:45 April 4, 2001 2884 8:00 to 9:00 3092 4:45 to 5:45 Week 2 3000 7:45 to 8:45 3216 5:00 to 6:00 April 9, 2001 3265 8:00 to 9:00 3329 5:00 to 6:00 April 10, 2001 3141 8:00 to 9:00 3322 5:00 to 6:00 April 12, 2001 3081 8:00 to 9:00 3473 4:45 to 5:45 April 12, 2001 3081 8:00 to 9:00 3413 4:45 to 5:45 Week 3 7 7:45 to 8:45 3311 4:30 to 5:30 April 22, 2001 3128 7:45 to 8:45 3311 4:30 to 5:30 April 24, 2001 3225 7:45 to 8:45 3286 5:00 to 6:00 April 25, 2001 3186 7:30 to 8:30 2681 4:45 to 5:45 April 30, 2001 2502 7:30 to 8:30 2681 4:45 to 5:45 May 1, 2001 2826 7:45 to 8:45 2967 5:00 to 6:00 May 2, 2001 2742 7:45 to 8:45 2967 5:00 to 6:00 May 3, 2001 </td <td>April 2, 2001</td> <td>3036</td> <td>7:45 to 8:45</td> <td>3323</td> <td>5:00 to 6:00</td> | April 2, 2001 | 3036 | 7:45 to 8:45 | 3323 | 5:00 to 6:00 |
| April 4, 2001 2284 8:00 to 9:00 3334 4:45 to 5:45 April 5, 2001 3000 7:45 to 8:45 3092 4:45 to 5:45 Week 2 | April 3, 2001 | 3059 | 7:45 to 8:45 | 3285 | 4:45 to 5:45 |
| April 5, 2001 3000 7:45 to 8:45 3216 5:00 to 6:00 April 9, 2001 3265 8:00 to 9:00 3329 5:00 to 6:00 April 9, 2001 3141 8:00 to 9:00 3362 5:00 to 6:00 April 10, 2001 3141 8:00 to 9:00 3367 5:00 to 6:00 April 12, 2001 3081 8:00 to 9:00 3397 5:00 to 6:00 April 23, 2001 3225 7:45 to 8:45 3311 4:30 to 5:30 April 24, 2001 3322 7:45 to 8:45 3281 5:00 to 6:00 April 25, 2001 3128 7:30 to 8:30 3326 5:00 to 6:00 April 26, 2001 3128 7:45 to 8:45 3281 5:00 to 6:00 April 27, 2001 2723 8:00 to 9:00 3154 4:45 to 5:45 Mapril 30, 2001 2602 7:30 to 8:30 2681 4:15 to 5:15 May 1, 2001 2826 7:45 to 8:45 2912 5:00 to 6:00 May 3, 2001 2595 8:00 to 9:00 3410 4:45 to 5:45 May 8, 2001 | April 4, 2001 | 2884 | 8:00 to 9:00 | 3334 | 4:45 to 5:45 |
| April 6, 2001 2610 8:00 to 9:00 3092 4:45 to 5:45 Week 2 April 9, 2001 3265 8:00 to 9:00 3322 5:00 to 6:00 April 10, 2001 3141 8:00 to 9:00 3362 5:00 to 6:00 April 12, 2001 3081 8:00 to 9:00 3473 4:45 to 5:45 April 22, 2001 3081 8:00 to 9:00 3413 4:45 to 5:45 Week 3 April 23, 2001 3285 7:45 to 8:45 3281 5:00 to 6:00 April 25, 2001 3129 7:45 to 8:45 3286 5:00 to 6:00 April 25, 2001 3129 7:45 to 8:45 3286 5:00 to 6:00 April 25, 2001 3129 7:45 to 8:45 3286 5:00 to 6:00 April 27, 2001 2723 8:00 to 9:00 3154 4:45 to 5:45 May 1, 2001 2502 7:30 to 8:30 2681 4:5 to 5:45 May 3; 2001 2632 8:00 to 9:00 2744 4:45 to 5:45 May 2, 2001 2742 7:45 to 8:45 2967 5:00 to 6:00 May 4; 2001 3559 8:00 to 9:00 </td <td>April 5, 2001</td> <td>3000</td> <td>7:45 to 8:45</td> <td>3216</td> <td>5:00 to 6:00</td> | April 5, 2001 | 3000 | 7:45 to 8:45 | 3216 | 5:00 to 6:00 |
| Week 2 April 9, 2001 3265 8:00 to 9:00 3329 5:00 to 6:00 April 10, 2001 3141 8:00 to 9:00 3473 4:45 to 5:45 April 12, 2001 3001 2973 8:00 to 9:00 3473 4:45 to 5:45 Week 3 April 22, 2001 3285 7:45 to 8:45 3311 4:30 to 5:30 April 24, 2001 3322 7:45 to 8:45 3311 4:30 to 5:30 April 25, 2001 3186 7:30 to 8:30 3326 4:45 to 5:45 April 26, 2001 3129 7:45 to 8:45 3286 5:00 to 6:00 April 27, 2001 2723 8:00 to 9:00 3154 4:45 to 5:45 Week 4 5:00 to 6:00 May 1, 2001 2822 7:45 to 8:45 2912 5:00 to 6:00 May 2, 2001 2742 7:45 to 8:45 2912 5:00 to 6:00 May 3, 2001 2632 8:00 to 9:00 3410 4:45 to 5:45 Week 5 6:00 to 9:00 3326 5 | April 6, 2001 | 2610 | 8:00 to 9:00 | 3092 | 4:45 to 5:45 |
| April 9, 2001 3265 8:00 to 9:00 3329 5:00 to 6:00 April 10, 2001 3141 8:00 to 9:00 3362 5:00 to 6:00 April 12, 2001 3081 8:00 to 9:00 3397 5:00 to 6:00 April 23, 2001 3273 8:00 to 9:00 3413 4:45 to 5:45 Week 3 | Week 2 | | | | |
| April 10, 2001 3141 8:00 to 9:00 3362 5:00 to 6:00 April 11, 2001 3081 8:00 to 9:00 3397 5:00 to 6:00 April 12, 2001 3081 8:00 to 9:00 3413 4:45 to 5:45 Week 3 - - - - April 23, 2001 3285 7:45 to 8:45 3281 5:00 to 6:00 April 24, 2001 3322 7:45 to 8:45 3281 5:00 to 6:00 April 25, 2001 3186 7:30 to 8:30 3326 4:45 to 5:45 April 27, 2001 2723 8:00 to 9:00 3154 4:45 to 5:45 Mek 4 - - - - - April 30, 2001 2502 7:30 to 8:30 2681 4:15 to 5:15 May 1, 2001 2826 7:45 to 8:45 2967 5:00 to 6:00 May 2, 2001 2742 7:45 to 8:45 2912 5:00 to 6:00 May 2, 2001 2635 8:00 to 9:00 3410 4:45 to 5:45 Week 5 - - - - - May 7 2001 3659 8:00 to 9:00 | April 9, 2001 | 3265 | 8:00 to 9:00 | 3329 | 5:00 to 6:00 |
| April 11, 2001 3107 8:00 to 9:00 3473 4:45 to 5:45 April 12, 2001 3081 8:00 to 9:00 3397 5:00 to 6:00 April 23, 2001 3285 7:45 to 8:45 3311 4:45 to 5:45 Week 3 7:45 to 8:45 3281 5:00 to 6:00 April 24, 2001 3322 7:45 to 8:45 3281 5:00 to 6:00 April 25, 2001 3186 7:30 to 8:30 3326 4:45 to 5:45 April 24, 2001 3129 7:45 to 8:45 3286 5:00 to 6:00 April 30, 2001 2723 8:00 to 9:00 3154 4:45 to 5:45 Week 4 7:45 to 8:45 2967 5:00 to 6:00 May 1, 2001 2826 7:45 to 8:45 2912 5:00 to 6:00 May 2, 2001 2742 7:45 to 8:45 2912 5:00 to 6:00 May 3, 2001 2632 8:00 to 9:00 2744 4:45 to 5:45 Week 5 May 7 2001 3604 8:00 to 9:00 3410 4:45 to 5:45 May 8, 2001 3458 8:00 to 9:00 3226 5:00 to 6:00 May 11, 2001 3478 <td>April 10, 2001</td> <td>3141</td> <td>8:00 to 9:00</td> <td>3362</td> <td>5:00 to 6:00</td> | April 10, 2001 | 3141 | 8:00 to 9:00 | 3362 | 5:00 to 6:00 |
| April 12, 2001 3081 8:00 to 9:00 3397 5:00 to 6:00 April 13, 2001 2973 8:00 to 9:00 3413 4:45 to 5:45 Week 3 April 23, 2001 3285 7:45 to 8:45 3311 4:30 to 5:30 April 24, 2001 3322 7:45 to 8:45 3281 5:00 to 6:00 April 25, 2001 3129 7:45 to 8:45 3286 5:00 to 6:00 April 27, 2001 2723 8:00 to 9:00 3154 4:45 to 5:45 Mapril 30, 2001 2502 7:30 to 8:30 2681 4:15 to 5:15 May 1, 2001 2826 7:45 to 8:45 2967 5:00 to 6:00 May 2, 2001 2722 7:45 to 8:45 2967 5:00 to 6:00 May 2, 2001 2632 8:00 to 9:00 2861 5:00 to 6:00 May 7 2001 3604 8:00 to 9:00 3410 4:45 to 5:45 Week 5 May 7 2001 3559 8:00 to 9:00 3326 5:00 to 6:00 May 1, 2001 3455 8:00 to 9:00 3326 5:00 to 6:00 | April 11, 2001 | 3107 | 8:00 to 9:00 | 3473 | 4:45 to 5:45 |
| April 13, 2001 2973 8:00 to 9:00 3413 4:45 to 5:45 Week 3 April 23, 2001 3285 7:45 to 8:45 3311 4:30 to 5:30 April 24, 2001 3322 7:45 to 8:45 3281 5:00 to 6:00 April 25, 2001 3186 7:30 to 8:30 3326 4:45 to 5:45 April 26, 2001 3129 7:45 to 8:45 3286 5:00 to 6:00 April 27, 2001 2723 8:00 to 9:00 3154 4:45 to 5:45 Week 4 April 30, 2001 2826 7:45 to 8:45 2917 5:00 to 6:00 May 1, 2001 2826 7:45 to 8:45 2912 5:00 to 6:00 May 2, 2001 2595 8:00 to 9:00 2861 5:00 to 6:00 May 7 2001 3604 8:00 to 9:00 3410 4:45 to 5:45 May 8, 2001 3559 8:00 to 9:00 3422 5:00 to 6:00 May 10, 2001 3478 8:00 to 9:00 3326 4:45 to 5:45 May 11, 2001 3393 8:00 to 9:00 3325 4:45 to 5:45 <td>April 12, 2001</td> <td>3081</td> <td>8:00 to 9:00</td> <td>3397</td> <td>5:00 to 6:00</td> | April 12, 2001 | 3081 | 8:00 to 9:00 | 3397 | 5:00 to 6:00 |
| Week 3 7:45 to 8:45 3311 4:30 to 5:30 April 24, 2001 3322 7:45 to 8:45 3281 5:00 to 6:00 April 25, 2001 3186 7:30 to 8:30 3326 4:45 to 5:45 April 26, 2001 3129 7:45 to 8:45 3286 5:00 to 6:00 April 27, 2001 2723 8:00 to 9:00 3154 4:45 to 5:45 Week 4 April 30, 2001 2502 7:30 to 8:30 2681 4:15 to 5:15 May 1, 2001 2826 7:45 to 8:45 2967 5:00 to 6:00 May 2, 2001 2632 8:00 to 9:00 2861 5:00 to 6:00 May 4, 2001 2595 8:00 to 9:00 3410 4:45 to 5:45 Week 5 May 7, 2001 3604 8:00 to 9:00 34410 4:45 to 5:45 May 8, 2001 3559 8:00 to 9:00 3422 5:00 to 6:00 May 11, 2001 3478 8:00 to 9:00 3326 5:00 to 6:00 May 14, 2001 3479 8:00 to 9:00 3374 5:00 to 6:00 May 15, | April 13, 2001 | 2973 | 8:00 to 9:00 | 3413 | 4:45 to 5:45 |
| April 23, 2001 3285 7:45 to 8:45 3311 4:30 to 5:30 April 25, 2001 3322 7:45 to 8:45 3281 5:00 to 6:00 April 26, 2001 3129 7:45 to 8:45 3286 5:00 to 6:00 April 27, 2001 2723 8:00 to 9:00 3154 4:45 to 5:45 Week 4 | Week 3 | | | | |
| April 24, 2001 3322 7:45 to 8:45 3281 5:00 to 6:00 April 25, 2001 3186 7:30 to 8:30 3326 4:45 to 5:45 April 26, 2001 3129 7:45 to 8:45 3286 5:00 to 6:00 April 27, 2001 2723 8:00 to 9:00 3154 4:45 to 5:45 Week 4 2502 7:30 to 8:30 2681 4:15 to 5:15 May 1, 2001 2826 7:45 to 8:45 2967 5:00 to 6:00 May 2, 2001 2742 7:45 to 8:45 2912 5:00 to 6:00 May 3, 2001 2632 8:00 to 9:00 2744 4:45 to 5:45 Week 5 | April 23, 2001 | 3285 | 7:45 to 8:45 | 3311 | 4:30 to 5:30 |
| April 25, 2001 3186 7:30 to 8:30 3326 4:45 to 5:45 April 26, 2001 3129 7:45 to 8:45 3286 5:00 to 6:00 April 30, 2001 2723 8:00 to 9:00 3154 4:45 to 5:45 Week 4 | April 24, 2001 | 3322 | 7:45 to 8:45 | 3281 | 5:00 to 6:00 |
| April 26, 2001 3129 7:45 to 8:45 3286 5:00 to 6:00 April 27, 2001 2723 8:00 to 9:00 3154 4:45 to 5:45 Week 4 | April 25, 2001 | 3186 | 7:30 to 8:30 | 3326 | 4:45 to 5:45 |
| April 27, 2001 2723 8:00 to 9:00 3154 4:45 to 5:45 Week 4 April 30, 2001 2502 7:30 to 8:30 2681 4:15 to 5:15 May 1, 2001 2826 7:45 to 8:45 2967 5:00 to 6:00 May 2, 2001 2742 7:45 to 8:45 2912 5:00 to 6:00 May 3, 2001 2632 8:00 to 9:00 2744 4:45 to 5:45 Week 5 | April 26, 2001 | 3129 | 7:45 to 8:45 | 3286 | 5:00 to 6:00 |
| Week 4 April 30, 2001 2502 7:30 to 8:30 2681 4:15 to 5:15 May 1, 2001 2826 7:45 to 8:45 2967 5:00 to 6:00 May 3, 2001 2742 7:45 to 8:45 2912 5:00 to 6:00 May 3, 2001 2632 8:00 to 9:00 2861 5:00 to 6:00 May 4, 2001 2595 8:00 to 9:00 2444 4:45 to 5:45 Week 5 | April 27, 2001 | 2723 | 8:00 to 9:00 | 3154 | 4:45 to 5:45 |
| April 30, 2001 2502 7:30 to 8:30 2681 4:15 to 5:15 May 1, 2001 2826 7:45 to 8:45 2967 5:00 to 6:00 May 2, 2001 2742 7:45 to 8:45 2912 5:00 to 6:00 May 3, 2001 2632 8:00 to 9:00 2861 5:00 to 6:00 May 4, 2001 2595 8:00 to 9:00 2744 4:45 to 5:45 Week 5 4:45 to 5:45 5:00 to 6:00 May 8, 2001 3559 8:00 to 9:00 3410 4:45 to 5:45 May 9, 2001 3455 8:00 to 9:00 3326 5:00 to 6:00 May 10, 2001 3478 8:00 to 9:00 3396 4:45 to 5:45 May 11, 2001 3393 8:00 to 9:00 3235 4:45 to 5:45 May 14, 2001 3479 8:00 to 9:00 3450 5:00 to 6:00 May 15, 2001 3756 8:00 to 9:00 3374 5:00 to 6:00 May 17, 2001 3533 8:00 to 9:00 3356 5:00 to 6:00 May 17, 2001 32246 <td< td=""><td>Week 4</td><td></td><td></td><td></td><td></td></td<> | Week 4 | | | | |
| May 1, 2001 2266 7:45 to 8:45 2967 5:00 to 6:00 May 2, 2001 2742 7:45 to 8:45 2912 5:00 to 6:00 May 3, 2001 2632 8:00 to 9:00 2641 5:00 to 6:00 May 4, 2001 2595 8:00 to 9:00 2744 4:45 to 5:45 Week 5 | April 30, 2001 | 2502 | 7:30 to 8:30 | 2681 | 4:15 to 5:15 |
| May 2, 2001 2742 7:45 to 8:45 2912 5:00 to 6:00 May 3, 2001 2632 8:00 to 9:00 2861 5:00 to 6:00 May 4, 2001 2595 8:00 to 9:00 2744 4:45 to 5:45 Week 5 | May 1, 2001 | 2826 | 7:45 to 8:45 | 2967 | 5:00 to 6:00 |
| May 3, 2001 2632 8:00 to 9:00 2861 5:00 to 6:00 May 4, 2001 2595 8:00 to 9:00 2744 4:45 to 5:45 Week 5 | May 2, 2001 | 2742 | 7:45 to 8:45 | 2912 | 5:00 to 6:00 |
| May 4, 2001 2595 8:00 to 9:00 2744 4:45 to 5:45 Week 5 | May 3, 2001 | 2632 | 8:00 to 9:00 | 2861 | 5:00 to 6:00 |
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| Average 3319 3446 90% Confidence Interval +/- 120 +/- 109 | November 2, 2001 | 3789 | 7:45 to 8:45 | 4277 | 5:00 to 6:00 |
| 90% Confidence Interval +/- 120 +/- 109 | Average | 3319 | | 3446 | |
| | 90% Confidence Interval | +/- 120 | | +/- 109 | |

 Table 3
 2001 Baseline Adjusted Traffic Totals

The average observed cut-through traffic percentages during the Spring monitoring period were about 14.14% percent during the AM peak hour and 18.55% percent during the PM peak hour. These numbers were 15.53% and 17.47%, respectively, during the Fall monitoring period. The traffic counts were reduced by these percentages in order to subtract out vehicles lacking a destination within the Stanford University campus. Spreadsheets showing the detailed license plate matching data are shown in Appendix E. A summary table showing the 80 daily cordon counts adjusted for parking lot factors and cut-through traffic is shown in Table 2 along with the average AM inbound and PM outbound traffic Volume. Table 3 shows the traffic data collected in the 2001 baseline Stanford Traffic Monitoring Program, including the baseline average and the 90% confidence interval.

INBOUND AM TRAFFIC

The 2001 baseline counts determined that an average of 3,439 inbound vehicles during the AM peak hour would constitute a significant increase in traffic at the 90% confidence level. The 2004 AM average of 3,176 vehicles does not represent a statistically significant increase over the AM baseline average with an upper threshold of 3,439 at the 90% confidence level. The average AM inbound volume of 3,176 is in fact 263 vehicles lower than the +90% confidence level. A scatter plot of the 2004 AM inbound data is shown in Figure 4. Lines representing the baseline average, baseline 90% confidence interval, and 2004 average are also shown in this figure. As shown in the figure the average 2004 volume is lower than the lower 90 percent confidence boundary from 2001.

Figure 4 2004 AM Peak Inbound vs. 2001 Baseline

OUTBOUND PM TRAFFIC

The 2001 baseline counts determined that an average of 3,555 outbound vehicles during the PM peak hour would constitute a significant increase in traffic at the 90% confidence level. The PM outbound adjusted average shows an increase of 196 vehicles from the baseline count, this increase falls above the +90% confidence interval by 87 vehicles. The 1% significant increase trigger was developed from 2001 baseline counts as 3,592 vehicles. The average 2004 PM outbound volume is calculated as 3,642 vehicles, this increase falls above the 1% increase trigger by 51 vehicles. Since the established 1% increased trigger requirement is met, additional mitigation is required if the trigger is exceeded in two out of three consecutive years for the same peak hour. Subsequent analysis is necessary to determine if sufficient trip credits are available to reduce the 2004 outbound PM peak traffic volume by 51 vehicles.

A scatter plot of the 2004 PM outbound data is shown in Figure 5. Lines representing the baseline average, baseline 90% confidence interval, and 2001 average are shown in this figure. As shown in Figure 5, the average 2004 data line falls above the +90% confidence level.

2004 PM PEAK HOUR TRIP CREDITS

The 2000 Stanford GUP Condition G.8 specifies that the County will recognize and "credit" Stanford off-campus trip reduction efforts within defined geographic boundaries. These credits will be applied to Stanford's attainment of the "no net new commute trip" standard. In 2003, Stanford and the County discussed potential methodologies for providing credits to Stanford. The County developed draft guidelines, which were reviewed by the Community Resource Group, and the Planning Office approved the final guidelines on October 9, 2003. These guidelines are presented in the "Stanford Traffic Cordon Count Credit Guidelines" dated October 28, 2003.

Stanford University's cordon count credits for 2004 are related to the increase in the number of bus trips across the cordon points and the number of passengers served outside the cordon area traveling in the PM peak hour. The credits compare the level of activity in 2000 to that in 2004. An average of 36 peak hour non-campus riders were estimated on the Marguerite A and B lines between 5:00 p.m. and 6:00 p.m. in the base year.

The number of boardings and alightings were measured on each Marguerite shuttle bus (A line, B line, C line and SLAC) in 2004 using the system's new Automated Transportation Management System. Most of the credits claimed are for the 77 passengers (mostly Stanford Hospital employees) getting on the shuttle outside the cordon area and traveling to the Palo Alto Caltrain Station. Smaller credits are claimed for other peak hour trips outside the cordon area, including 14 credits for Stanford Hospital employees using the U-line to reach the East Bay Express and two credits for university employees using a Caltrian GO Pass (provided by the university) and taking the Research Park shuttle from the California Avenue Train Station to a destination in Research Park. As outlined in the adopted trip credit guidelines, full credits are claimed for trips in the peak direction and 1/3 credits are claimed for trips in the reverse peak direction.

Based on onboard surveys there are four pass through credits claimed for passengers who boarded the A line outside the cordon, passed through the campus, and then exited the shuttle outside the campus. Also, five credits were claimed for the increase in the number of shuttle bus crossings over the cordon points in the peak direction. Based on the trip credits discussed above, there are a total of 102 trip credits in 2004 (77 + 14 + 2 + 4 + 5 = 102). The net trips credits are then calculated by subtracting the average number of non-campus riders on the shuttle system in the base year (36) from 102 to get the 2004 PM peak hour trip credit of 66 trips (102 - 36 = 66).

CONCLUSION

The AM inbound adjusted average shows a decrease of 143 vehicles from the baseline count to the 2004 average count. The 2004 AM inbound volume also shows the decrease from the 90% confidence interval of \pm 120 by 263 vehicles and 23 vehicles, respectively. Since the AM inbound volumes are lower in 2004 compared to the 2001 baseline, no mitigation measures are required if the trigger is not exceeded in two out of three consecutive years for the same peak hour.

The PM outbound count totaled 3,642 vehicles which was an increase of 196 vehicles from the baseline, which is 87 vehicles above the 90% confidence interval and 51 vehicles more than the 1% established trigger. However, after applying the 66 trip credits, the volume is 15 trips below exceeding the 1% established trigger. Therefore, this increase is not significant. Mitigation measures are required if the trigger is exceeded in two out of three consecutive years for the same peak hour.

Table 4 summarizes the comparison between the baseline 2001 counts and the 2004 monitoring counts, including the applicable trip credits.

Table 42004 Monitoring Comparison to Baseline

| Inbound AM: | |
|---|---------|
| Adjusted Average 2004 Count | 3,176 |
| Baseline-established 90% Confidence Interval (2001) | +/- 120 |
| Baseline-established Significant Traffic Increase (2001) | 3,439 |
| Baseline-established 1% Increase Trigger (2001) | 3,474 |
| Result (Falls below the 90% Confidence Interval by 263 vehicles) | -263 |
| Result (Falls below the 1% increase Trigger by 298 vehicles) | -298 |
| Outbound PM: | |
| Adjusted Average 2004 Count | 3,642 |
| Baseline-established 90% Confidence Interval (2001) | +/- 109 |
| Baseline-established Significant Traffic Increase (2001) | 3,555 |
| Baseline-established 1% Increase Trigger (2001) | 3,591 |
| Result (Falls above the 90% Confidence Interval by 87 vehicles) | +87 |
| Result (Falls above the 1% Trigger by 51 vehicles) | +51 |
| 2004 Trip Credit | -66 |
| Result with Trip Credit (Falls below the 1% Trigger by 15 vehicles) | -15 |

APPENDIX

SUMMARY AND COMPARASION OF PREVIOUS REPORTS

INTRODUCTION

The purpose of the Stanford University Traffic Monitoring Program is to compare traffic volumes entering and exiting the Stanford Campus during the inbound AM peak and the outbound PM commute peak to a traffic baseline. This comparison is completed on annual basis. The requirements for establishment of the traffic baseline and performing annual comparisons to the baseline are contained within the December 2000 Stanford Community Plan/General Use Permit (GUP)/Environmental Impact Report (EIR) and within the 2000 Stanford General Use Permit. Stanford is required to attain a "no net new commute trip" standard as defined in the GUP and EIR.

Condition of Approval G.7 outlines the process for establishing the baseline counts and for continuing monitoring in subsequent years. The process can be summarized as follows:

- Peak hour traffic is counted at least three times per year for a two-week period each time. The three counts shall be averaged to determine the annual traffic level.
- All counts are recorded at the 16 campus entry and exit points forming a cordon around the campus.
- License plate numbers are recorded for each entering and exiting vehicle to determine the amount of non-campus traffic.
- Cordon volumes are adjusted for parking lots within the cordon used by the hospital (these volumes are subtracted from the cordon line counts) and parking lots outside the cordon used by the university (these volumes are added to the cordon line counts).
- A peak hour is then established for the campus based on the counts, adjusted for cut through and parking lot location.

Condition of Approval G.6 defines the peak commute directions as entering the campus in the morning peak commute period and leaving the campus in the evening commute period. The peak commute period is defined as the one-hour period of time between 7 AM and 9 AM and again between 4 PM and 6 PM with the highest volume of traffic, as defined by the counts. Therefore, the two peak hours are considered to be independent events. An increase in traffic during the AM peak hour is independent from an increase in traffic during the PM peak hour. An increase in traffic for two out of three years in one peak hour would trigger the additional element of the monitoring program, even if there is no change or even a decrease in traffic in the other peak hour. Also, a significant increase during one year in the AM and a sufficient increase in the PM for the following year would not trigger additional mitigation.

The following is a summary of the Baseline report prepared in 2001 and the subsequent three years of monitoring from 2002 through 2004.

Traffic Baseline Report

The Traffic Baseline Report represents the first year of traffic monitoring. This report established the baseline conditions tom which subsequent years are compared.

| Data Collection: | Week of April 2, 2001 through week of May 14 2001 and week of Oc 2001 through week of October 29, 2001. | tober 22, |
|----------------------|--|--|
| Final Report Issued: | July 2002 and updated on October 2003. | |
| Findings: | The following were the results of the 2001 Baseline Monitoring: Inbound AM: Average Count 90% Confidence Interval Significant Traffic Increase 1% Increase Trigger Outbound PM: Average 90% Confidence Interval Significant Traffic Increase 1% Increase Trigger 90% Confidence Interval Significant Traffic Increase 1% Trigger | 3,319 +/- 120 3,439 3,474 3,446 +/- 109 3,555 3,591 |
| Conclusion | The Traffic Baseline Report established the baseline thresholds, no conclusions are drawn from this report. | |

Traffic Report #1

Traffic Report #1 was the first year of monitoring compared back to the Traffic Baseline Report.

| Data Collection: | Week of April 15, 2002 through week of May 20 2002 and week 2002 through week of October 21, 2002. | of October 14, |
|-----------------------|--|---|
| Final Report Issued: | July 2003 | |
| Final Report Revised: | October 2003 | |
| Findings: | The following were the results of the Report #1, 2002 Traffic Mo Inbound AM: Adjusted Average 2002 Count Baseline-established 90% Confidence Interval (2001) Baseline-established Significant Traffic Increase (2001) Baseline-established 1% Increase Trigger (2001) Result (Falls below the 1% Trigger by 199) Outbound PM: Adjusted Average 2002 Count Baseline-established 90% Confidence Interval (2001) Baseline-established 90% Confidence Interval (2001) Baseline-established 90% Confidence Interval (2001) Baseline-established 10% Increase Trigger (2001) Baseline-established 1% Increase Trigger (2001) Result (Falls below the 1% Trigger by 5 vehicles) | nitoring: 3,275 +/- 120 3,439 3,474 -199 3,586 +/- 109 3,555 3,591 -5 |
| Conclusion | The AM inbound adjusted average shows a decrease of 44 version baseline, this decrease falls within the 90% confidence interval | hicles from the of +/- 120. The |

Traffic Report #2

Traffic Report #2 was the second year of monitoring compared back to the Traffic Baseline Report.

| Data Collection: | Week of April 7, 2003 and week of April 21, 2003 through week of M 2003, week of September 29, 2003 and week of October 20, 2003. | lay 19, |
|-----------------------|---|---|
| Final Report Issued: | January 2004 | |
| Final Report Revised: | October 2004 | |
| Findings: | The following were the results of the Report #2, 2003 Traffic Monitor | ing: |
| | Inbound AM: Adjusted Average 2003 Count Baseline-established 90% Confidence Interval (2001) Baseline-established Significant Traffic Increase (2001) Baseline-established 1% Increase Trigger (2001) Result (Falls below the 90% Confidence Interval by 26) Result (Falls below the 1% Trigger by 61 vehicles) | 3,413 +/- 120 3,439 3,474 -26 -61 |
| | Outbound PM: Adjusted Average 2003 Count Baseline-established 90% Confidence Interval (2001) Baseline-established Significant Traffic Increase (2001) Baseline-established 1% Increase Trigger (2001) Result (Falls below the 90% Confidence Interval by 79 vehicles) Result (Falls below the 1% Trigger by 115 vehicles) | 3,476 +/- 109 3,555 3,591 -79 -115 |
| Conclusion | Although the AM inbound adjusted average shows an increase of $\frac{9}{10}$ from the Baseline count, this increase falls within the 90% confider of <u>+</u> 120. Therefore, this 94-vehicle increase does not represent a increase in traffic during the AM peak hour and no additional m required. | 94 vehicles nce interval significant nitigation is |
| | The PM peak outbound adjusted average increased by 30 vehicles f Baseline PM counts. This increase is also not significant because it the 90% confidence boundary of \pm 109, no additional mitigation is rec The 2003 volumes compared to 2001 baseline volumes do not const statistical significant increase in either the AM or the PM peak hours. | rom the falls within quired. titute a |

Traffic Report #3

Traffic Report #3 was the third year of monitoring compared back to the Traffic Baseline Report.

| Data Collection: | Week of April 12, 2004 through week of May 17, 2004 and week of September 27, 2004 through week of October 4, 2004. |
|----------------------|--|
| Final Report Issued: | March 2005 |
| Findings: | The following were the results of the Report #3, 2004 Traffic Monitoring: |
| | Inbound AM:3,176Adjusted Average 2004 Count3,176Baseline-established 90% Confidence Interval (2001)+/- 120Baseline-established Significant Traffic Increase (2001)3,439Baseline-established 1% Increase Trigger (2001)3,474Result (Falls below the 90% Confidence Interval by 263)-263Result (Falls below the 1% Trigger by 298 vehicles)-298 |
| | Outbound PM:3,642Adjusted Average 2004 Count3,642Baseline-established 90% Confidence Interval (2001)+/- 109Baseline-established Significant Traffic Increase (2001)3,555Baseline-established 1% Increase Trigger (2001)3,591Result (Falls above the 90% Confidence Interval by 87 vehicles)+87Result (Falls above the 1% Trigger by 51 vehicles)+512004 Trip Credit-66Result with Trip Credit (Falls below the 1% Trigger by 15 vehicles)-15 |
| Conclusion | The AM inbound adjusted average shows a decrease of 143 vehicles from the Baseline, this decrease falls below the +90% confidence interval by 263. The established 1% increase trigger requirement is not met, no additional mitigation is required. |
| | The PM peak outbound adjusted average increased by 196 vehicles from the Baseline counts. This increase is above the +90% confidence interval by 87 vehicles. This increase is significant because it falls above the 1% increase trigger by 51 vehicles. However, after applying 66 trip credits the PM peak outbound traffic was within the 1% trigger, therefore, no additional mitigation is required. |