STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

STANDARD ENCROACHMENT PERMIT APPLICATION

TR-0100 (REV. 03/2015)

Please type or print clearly your answers. Complete ALL fields, write "N/A" if not applicable.
This application is not complete until all requirements have been approved.

Permission is requested to encroach on the State Highway right-of-way as follows:

FOR CALTRANS USE
PERMIT NO.
DIST/CO/RTE/PM
SIMPLEX STAMP
DATE OF SIMPLEX STAMP

1. COUNTY	2. ROUTE	3. POSTMILE
San Mateo County	82	Various

4. ADDRESS OR STREET NAME	5. CITY
El Camino Real	Millbrae

6. CROSS STREET (Distance and direction from project site)	7. PORTION OF RIGHT-OF-WAY
Various	Various

8. WORK TO BE PERFORMED BY	9. ESTIMATED START DATE	10. ESTIMATED COMPLETION DATE
☑ OWN FORCES ☑ CONTRACTOR	04/30/2016	12/31/2016

11. EXCAVATION	MAX. DEPTH	AVG. DEPTH	AVG. WIDTH	LENGTH	SURFACE TYPE
	N/A	N/A	N/A	N/A	N/A

12. ESTIMATED COST WITHIN STATE HIGHWAY RIGHT-OF-WAY	FUNDING SOURCE(S)
	☐ FEDERAL ☐ STATE ☑ LOCAL ☐ PRIVATE

13. PIPES	PRODUCT TYPE	DIAMETER	VOLTAGE / PSIG	14. CALTRANS' PROJECT CODE (ID)
	N/A	N/A	N/A	N/A

15. ☐ Double Permit **Parent Permit Number** N

Applicant's Reference Number / Utility Work Order Number

16. **Have your plans been reviewed by another Caltrans branch?** ☑ NO ☐ YES (If "YES") **Who?**

17. **Completely describe work to be done within STATE Highway right-of-way:**

Attach 6 complete sets of plans (folded to 8.5" x 11") and any applicable specifications, calculations, maps, etc.

Perform routine emergency maintenance & repair work on permittee's existing water, sewer and drainage facilities, sidewalk, curb & gutter, streetlights, landscaping, median and street sweeping on State Highway 04-SM-82, at various post mile locations in the City of Millbrae.

18. **Is a City, County or other public agency involved in the approval of this project?**

☑ YES **(If "YES", check type of project AND attach environmental documentation and conditions of approval)**

☐ COMMERCIAL DEVELOPMENT ☐ BUILDING ☐ GRADING ☑ OTHER Maintenance/Repair of City Infrastructure & Utilities

☐ CATEGORICALLY EXEMPT ☐ NEGATIVE DECLARATION ☐ ENVIRONMENTAL IMPACT REPORT ☐ OTHER

☐ NO **(If "NO", please check the category below which best describes the project AND answer questions A - K on page 2)**

☐ DRIVEWAY OR ROAD APPROACH, RECONSTRUCTION, MAINTENANCE OR RESURFACING
☐ PUBLIC UTILITY MODIFICATIONS, EXTENSIONS, HOOKUPS
☐ FLAGS, SIGNS, BANNERS, DECORATIONS, PARADES AND CELEBRATIONS
☐ OTHER

☐ FENCE
☐ MAILBOX
☐ EROSION CONTROL
☐ LANDSCAPING

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STANDARD ENCROACHMENT PERMIT APPLICATION

TR-0100 (REV. 03/2015)

PERMIT NO.

The following questions must be completed when a City, County or other public agency IS NOT involved in the approval of this project.

Your answers to these questions will assist Departmental staff in identifying any physical, biological, social or economic resources that may be affected by your proposed project within State Highway right-of-way and to determine which type of environmental studies may be required to approve your application for an encroachment permit.

It is the applicant's responsibility for the production of all required environmental documentation and supporting studies and in some cases this may be costly and time consuming. If possible, attach photographs of the location of the proposed project. Please answer these questions to the best of your ability. Provide a description of any "YES" answers (type, name, number, etc.)

A. Will any existing vegetation and/or landscaping within State Highway right-of-way be disturbed?

B. Are there waterways (e.g. river, creek, pond, natural pool or dry streambed) adjacent to or within the limits of the project or State Highway right-of-way?

C. Is the proposed project located within five miles of the coast line?

D. Will the proposed project generate construction noise levels greater than 86 dBA (e.g. jack-hammering, pile driving)?

E. Will the proposed project incorporate land from a public park, recreation area or wildlife refuge open to the public?

F. Are there any recreational trails or paths within the limits of the proposed project or State Highway right-of-way?

G. Will the proposed project impact any structures, buildings, rail lines or bridges within State Highway right-of-way?

H. Will the proposed project impact access to any businesses or residences?

I. Will the proposed project impact any existing public utilities or public services?

J. Will the proposed project impact existing pedestrian facilities, such as sidewalks, crosswalks or overcrossings?

K. Will new lighting be constructed within or adjacent to State Highway right-of-way?

19. Will this project cause a substantial change in the significance of a historical resource (45 years or older), or cultural resource? ☐ YES ☒ NO
(If "YES", provide a description)

20. Is this project on an existing State Highway or street where the activity involves removal of a scenic resource including a significant tree or stand of trees, a rock outcropping or a historic building? ☐ YES ☒ NO (If "YES", provide a description)

21. Is work being done on the applicant's property? ☒ YES ☐ NO (If "YES", attach 6 complete sets of site and grading plans.)

22. Will the proposed project require the disturbance of soil? ☐ YES ☒ NO

If "YES", estimate the area within State Highway right-of-way in square feet AND acres: _____ (ft^2) AND _____ (acres)

estimate the area outside of State Highway right-of-way in square feet AND acres: _____ (ft^2) AND _____ (acres)

23. Will the proposed project require dewatering? ☐ YES ☒ NO

If "YES", estimate total gallons AND gallons/month. _____ (gallons) AND _____ (gallons/month)

SOURCE*: ☐ STORM WATER ☐ NON-STORM WATER

(*See Caltrans SWMP for definitions of non-storm water discharge: http://www.dot.ca.gov/hq/env/stormwater/index.htm)

24. How will any storm water or ground water be disposed of from within or near the limits of the proposed project?

☒ Storm Drain System ☐ Combined Sewer / Storm System ☐ Storm Water Retention Basin

☐ Other (explain): _____

STANDARD ENCROACHMENT PERMIT APPLICATION

TR-0100 (REV. 03/2015)

PERMIT NO.

PLEASE READ THE FOLLOWING CLAUSES PRIOR TO SIGNING THIS ENCROACHMENT PERMIT APPLICATION.

The applicant, understands and herein agrees that an encroachment permit can be denied, and/or a bond required for non-payment of prior or present encroachment permit fees. Encroachment Permit fees may still be due when an application is withdrawn or denied, and that a denial may be appealed, in accordance with the California Streets and Highways Code, Section 671.5. All work shall be done in accordance with the California Department of Transportation's (Department) rules and regulations subject to inspection and approval.

The applicant, understands and herein agrees to the general provisions, special provisions and conditions of the encroachment permit, and to indemnify and hold harmless the State, its officers, directors, agents, employees and each of them (Indemnitees) from and against any and all claims, demands, causes of action, damages, costs, expenses, actual attorneys' fees, judgments, losses and liabilities of every kind and nature whatsoever (Claims) arising out of or in connection with the issuance and/or use of this encroachment permit and the placement and subsequent operation and maintenance of said encroachment for: 1) bodily injury and/or death to persons including but not limited to the Applicant, the State and its officers, directors, agents and employees, the Indemnities, and the public; and 2) damage to property of anyone. Except as provided by law, the indemnification provisions stated above shall apply regardless of the existence or degree of fault of Indemnities. The Applicant, however, shall not be obligated to indemnify Indemnities for Claims arising from the sole negligence and willful misconduct of State, its officers, directors, agents or employees.

An encroachment permit is not a property right and does not transfer with the property to a new owner.

COMPLIANCE WITH THE AMERICANS WITH DISABILITIES ACT (ADA) OF 1990: All work within State Highway right-of-way shall be conducted in compliance with all applicable Federal, State and Local Access laws, regulations and guidelines including but not limited to the Americans with Disabilities Act Accessibility Guidelines (ADAAG), the Public Rights-of-Way Guidelines (PROWG), the Department's current Design Information Bulletin 82, "Pedestrian Accessibility Guidelines for Highway Projects", the Department's Encroachment Permits Manual and encroachment permit.

DISCHARGES OF STORM WATER AND NON-STORM WATER: All work within State Highway right-of-way shall be conducted in compliance with all applicable requirements of the National Pollutant Discharge Elimination System (NPDES) permit issued to the Department, to govern the discharge of storm water and non-storm water from its properties. Work shall also be in compliance with all other applicable Federal, State and Local laws and regulations, and with the Department's Encroachment Permits Manual and encroachment permit. Compliance with the Department's NPDES permit requires amongst other things, the preparation and submission of a Storm Water Pollution Protection Plan (SWPPP), or a Water Pollution Control Program (WPCP), and the approval of same by the appropriate reviewing authority prior to the start of any work. Information on the requirements may also be reviewed on the Department's Construction Website at:

http://www.dot.ca.gov/hq/construc/stormwater

25. NAME OF APPLICANT OR ORGANIZATION
CITY OF MILLBRAE

ADDRESS OF APPLICANT OR ORGANIZATION WHERE PERMIT IS TO BE MAILED (Include City and Zip Code)
621 Magnolia Avenue Millbrae, CA 94030

E-MAIL ADDRESS	PHONE NUMBER	FAX NUMBER
@ci.millbrae.ca.us	650-259-2419	650-697-8158

26. NAME OF AUTHORIZED AGENT / ENGINEER (A "Letter of authorization" is required if different from #25)
Khee Lim

IS A LETTER OF AUTHORIZATION ATTACHED? ☐ YES ☑ NO

ADDRESS OF AUTHORIZED AGENT / ENGINEER (Include City and Zip Code)
621 Magnolia Avenue Millbrae, CA 94030

E-MAIL ADDRESS	PHONE NUMBER	FAX NUMBER
@ci.millbrae.ca.us	650-259-2339	650-697-8158

27. NAME OF BILLING CONTACT (Same as #25 ☑ Same as #26 ☐)

BILLING ADDRESS WHERE INVOICE(S) IS/ARE TO BE MAILED (Include City and Zip Code)
621 Magnolia Avenue Millbrae, CA 94030

E-MAIL ADDRESS	PHONE NUMBER	FAX NUMBER
@ci.millbrae.ca.us	650-259-2419	650-697-8158

28. SIGNATURE OF APPLICANT OR AUTHORIZED AGENT	29. PRINT OR TYPE NAME	30.TITLE	31. DATE
	Khee Lim	City Engineer	04/07/2016

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

STANDARD ENCROACHMENT PERMIT APPLICATION

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This application is not complete until all requirements have been approved.

Permission is requested to encroach on the State Highway right-of-way as follows:

FOR CALTRANS USE
PERMIT NO.
DIST/CO/RTE/PM
SIMPLEX STAMP
DATE OF SIMPLEX STAMP

1. COUNTY	2. ROUTE	3. POSTMILE
San Mateo	US101	17.90

4. ADDRESS OR STREET NAME	5. CITY
US101 Southbound Off Ramp	Millbrae

6. CROSS STREET (Distance and direction from project site)	7. PORTION OF RIGHT-OF-WAY
Millbrae Avenue	Off Ramp

8. WORK TO BE PERFORMED BY	9. ESTIMATED START DATE	10. ESTIMATED COMPLETION DATE
☑ OWN FORCES ☑ CONTRACTOR	N/A	N/A

11. EXCAVATION	MAX. DEPTH	AVG. DEPTH	AVG. WIDTH	LENGTH	SURFACE TYPE
	N/A	N/A	N/A	N/A	Asphalt Concrete

12. ESTIMATED COST WITHIN STATE HIGHWAY RIGHT-OF-WAY	FUNDING SOURCE(S)
$ 0.00	☐ FEDERAL ☐ STATE ☑ LOCAL ☐ PRIVATE

13. PIPES	PRODUCT TYPE	DIAMETER	VOLTAGE / PSIG	14. CALTRANS' PROJECT CODE (ID)
	N/A	N/A	N/A	N/A

15. ☐ **Double Permit** **Parent Permit Number** N/A

Applicant's Reference Number / Utility Work Order Number N/A

16. **Have your plans been reviewed by another Caltrans branch?** ☐ NO ☑ YES **(If "YES")** **Who?** 0407-NMC-0929

17. **Completely describe work to be done within STATE Highway right-of-way:**

Attach 6 complete sets of plans (folded to 8.5" x 11") and any applicable specifications, calculations, maps, etc.

No additional work will be performed within STATE right-of-way.
The encroachment application is to comply with Traffic Operations Policy Directive 14-01 Revision 1 for ARLES at the El Camino Real and Millbrae Avenue intersection that has been operation since 2009.
Please see attached traffic engineering study prepared by DKS Associates dated March 29, 2016.

18. **Is a City, County or other public agency involved in the approval of this project?**

☐ YES **(If "YES", check type of project AND attach environmental documentation and conditions of approval)**

☐ COMMERCIAL DEVELOPMENT ☐ BUILDING ☐ GRADING ☐ OTHER _____

☑ CATEGORICALLY EXEMPT ☐ NEGATIVE DECLARATION ☐ ENVIRONMENTAL IMPACT REPORT ☐ OTHER _____

☑ NO **(If "NO", please check the category below which best describes the project AND answer questions A - K on page 2)**

☐ DRIVEWAY OR ROAD APPROACH, RECONSTRUCTION, MAINTENANCE OR RESURFACING
☐ PUBLIC UTILITY MODIFICATIONS, EXTENSIONS, HOOKUPS
☐ FLAGS, SIGNS, BANNERS, DECORATIONS, PARADES AND CELEBRATIONS
☐ OTHER ARLES
☐ FENCE
☐ MAILBOX
☐ EROSION CONTROL
☐ LANDSCAPING

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It is the applicant's responsibility for the production of all required environmental documentation and supporting studies and in some cases this may be costly and time consuming. If possible, attach photographs of the location of the proposed project. Please answer these questions to the best of your ability. Provide a description of any "YES" answers (type, name, number, etc.)

A. Will any existing vegetation and/or landscaping within State Highway right-of-way be disturbed?
No

B. Are there waterways (e.g. river, creek, pond, natural pool or dry streambed) adjacent to or within the limits of the project or State Highway right-of-way?
No

C. Is the proposed project located within five miles of the coast line?
No

D. Will the proposed project generate construction noise levels greater than 86 dBA (e.g. jack-hammering, pile driving)?
No

E. Will the proposed project incorporate land from a public park, recreation area or wildlife refuge open to the public?
No

F. Are there any recreational trails or paths within the limits of the proposed project or State Highway right-of-way?
No

G. Will the proposed project impact any structures, buildings, rail lines or bridges within State Highway right-of-way?
No

H. Will the proposed project impact access to any businesses or residences?
No

I. Will the proposed project impact any existing public utilities or public services?
No

J. Will the proposed project impact existing pedestrian facilities, such as sidewalks, crosswalks or overcrossings?
No

K. Will new lighting be constructed within or adjacent to State Highway right-of-way?
No

19. Will this project cause a substantial change in the significance of a historical resource (45 years or older), or cultural resource? ☐ YES ☑ NO
(If "YES", provide a description)

20. Is this project on an existing State Highway or street where the activity involves removal of a scenic resource including a significant tree or stand of trees, a rock outcropping or a historic building? ☐ YES ☑ NO (If "YES", provide a description)

21. Is work being done on the applicant's property? ☐ YES ☑ NO (If "YES", attach 6 complete sets of site and grading plans.)

22. Will the proposed project require the disturbance of soil? ☐ YES ☑ NO
If "YES", estimate the area within State Highway right-of-way in square feet AND acres: _____ (ft^2) AND _____ (acres)
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23. Will the proposed project require dewatering? ☐ YES ☑ NO
If "YES", estimate total gallons AND gallons/month. _____ (gallons) AND _____ (gallons/month)
SOURCE*: ☐ STORM WATER ☐ NON-STORM WATER
(*See Caltrans SWMP for definitions of non-storm water discharge: http://www.dot.ca.gov/hq/env/stormwater/index.htm)

24. How will any storm water or ground water be disposed of from within or near the limits of the proposed project?
☐ Storm Drain System ☐ Combined Sewer / Storm System ☐ Storm Water Retention Basin
☑ Other (explain): N/A

STANDARD ENCROACHMENT PERMIT APPLICATION

TR-0100 (REV. 03/2015)

PERMIT NO.

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The applicant, understands and herein agrees to the general provisions, special provisions and conditions of the encroachment permit, and to indemnify and hold harmless the State, its officers, directors, agents, employees and each of them (Indemnitees) from and against any and all claims, demands, causes of action, damages, costs, expenses, actual attorneys' fees, judgments, losses and liabilities of every kind and nature whatsoever (Claims) arising out of or in connection with the issuance and/or use of this encroachment permit and the placement and subsequent operation and maintenance of said encroachment for: 1) bodily injury and/or death to persons including but not limited to the Applicant, the State and its officers, directors, agents and employees, the Indemnities, and the public; and 2) damage to property of anyone. Except as provided by law, the indemnification provisions stated above shall apply regardless of the existence or degree of fault of Indemnities. The Applicant, however, shall not be obligated to indemnify Indemnities for Claims arising from the sole negligence and willful misconduct of State, its officers, directors, agents or employees.

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http://www.dot.ca.gov/hq/construc/stormwater

25. NAME OF APPLICANT OR ORGANIZATION
City of Millbrae

ADDRESS OF APPLICANT OR ORGANIZATION WHERE PERMIT IS TO BE MAILED (Include City and Zip Code)
621 Magnolia Avenue, Millbrae, CA 94030

E-MAIL ADDRESS	PHONE NUMBER	FAX NUMBER
@ci.millbrae.ca.us	650.259.2347	650.697.8158

26. NAME OF AUTHORIZED AGENT / ENGINEER (A "Letter of authorization" is required if different from #25)
Khee Lim

IS A LETTER OF AUTHORIZATION ATTACHED? ☐ YES ☑ NO

ADDRESS OF AUTHORIZED AGENT / ENGINEER (Include City and Zip Code)
621 Magnolia Avenue, Millbrae, CA 94030

E-MAIL ADDRESS	PHONE NUMBER	FAX NUMBER
@ci.millbrae.ca.us	650.259.2347	650.697.8158

27. NAME OF BILLING CONTACT (Same as #25 ☑ Same as #26 ☐)

BILLING ADDRESS WHERE INVOICE(S) IS/ARE TO BE MAILED (Include City and Zip Code)

E-MAIL ADDRESS	PHONE NUMBER	FAX NUMBER

28. SIGNATURE OF APPLICANT OR AUTHORIZED AGENT	29. PRINT OR TYPE NAME	30. TITLE	31. DATE
	Khee Lim	City Engineer	4-15-2016

MEMORANDUM

DATE: March 29, 2016

TO: **Khee Lim, PE, City of Millbrae, CA**

FROM: Kenny Jeong, PE, DKS Associates

SUBJECT: Millbrae Automated Red Light Enforcement – Traffic Engineering Study P#16015--000

The purpose of this memorandum is to document the findings of a study into the effectiveness of two traffic signals with automated red light enforcement (ARLE) in the City of Millbrae, CA on California Department of Transportation (Caltrans)-operated State Highways. Specifically, the study sought to evaluate the effect of the ARLE system on crash rates and the issuance of citations at the two study intersections.

BACKGROUND

On August 5, 2015 (effective January 1, 2016), Caltrans issued Traffic Operations Policy Directive TR-0011, Number 14-01, Revision 1, requiring all municipalities that operate one or more ARLE-equipped traffic signal on State Highways to evaluate the safety performance of such ARLE systems once every five years. The Policy Directive directs municipalities to consider the following aspects of safety performance at and near the study intersections equipped with ARLE:

- Collision rates;
- Citation rates for through movement, left turn, and, where prohibited, right turn on red infractions;
- Site conditions, current signal operation, and driver behavior; and
- Perceptions of parties familiar with the intersection(s) regarding traffic safety.

In 2006, the Millbrae City Council approved the use of ARLE cameras given increased vehicle traffic, roadway congestion and traffic collisions in the Millbrae Avenue traffic corridor. Red light safety cameras are located at three intersections with a total of seven cameras. Along with being very congested and well-traveled, these intersections are among the largest in the city and include multiple lanes. The existing roadway geometry does not provide for a safe space to pull violators over for enforcement at any of the intersections. To rely solely on traditional enforcement efforts in these areas present extreme challenges in achieving law enforcement objectives and enhancing safety for the public.

Despite the size and amount of daily traffic, collision statistics are low. The level of awareness associated with the ARLE program has contributed to maintain the low frequency of collisions at these intersections.

Since the program began, the ARLE program has resulted in the issuance of between 250 and 1200 citations per month. This process is administered by the San Mateo County Sheriff's Department. Approximately 96% of the citations issued as a result of the ARLE program are upheld in the local court system. Repeat violations are rare which indicates success in changing driving behavior.

STUDY AREA

The City of Millbrae operates ARLE at three intersections along Millbrae Avenue:

1. El Camino Real (State Route 82) / Millbrae Avenue;
2. Rollins Road / Millbrae Avenue; and
3. Southbound US101 Off-ramp / Millbrae Avenue.

Because these intersections are closely spaced, they are managed as a single system. As such, many of the program metrics are reported as a system instead of as individual intersections. Since the intersections of Rollins Road / Millbrae Avenue is not within the State-governed right-of-way, it is not directly included as part of this study. However, because the records of the three intersections are reported as a single system, the records for this intersection cannot be separated from the others and will therefore be included indirectly as part of the study. The study area showing the locations of each intersection are provided in **Figure 1**.

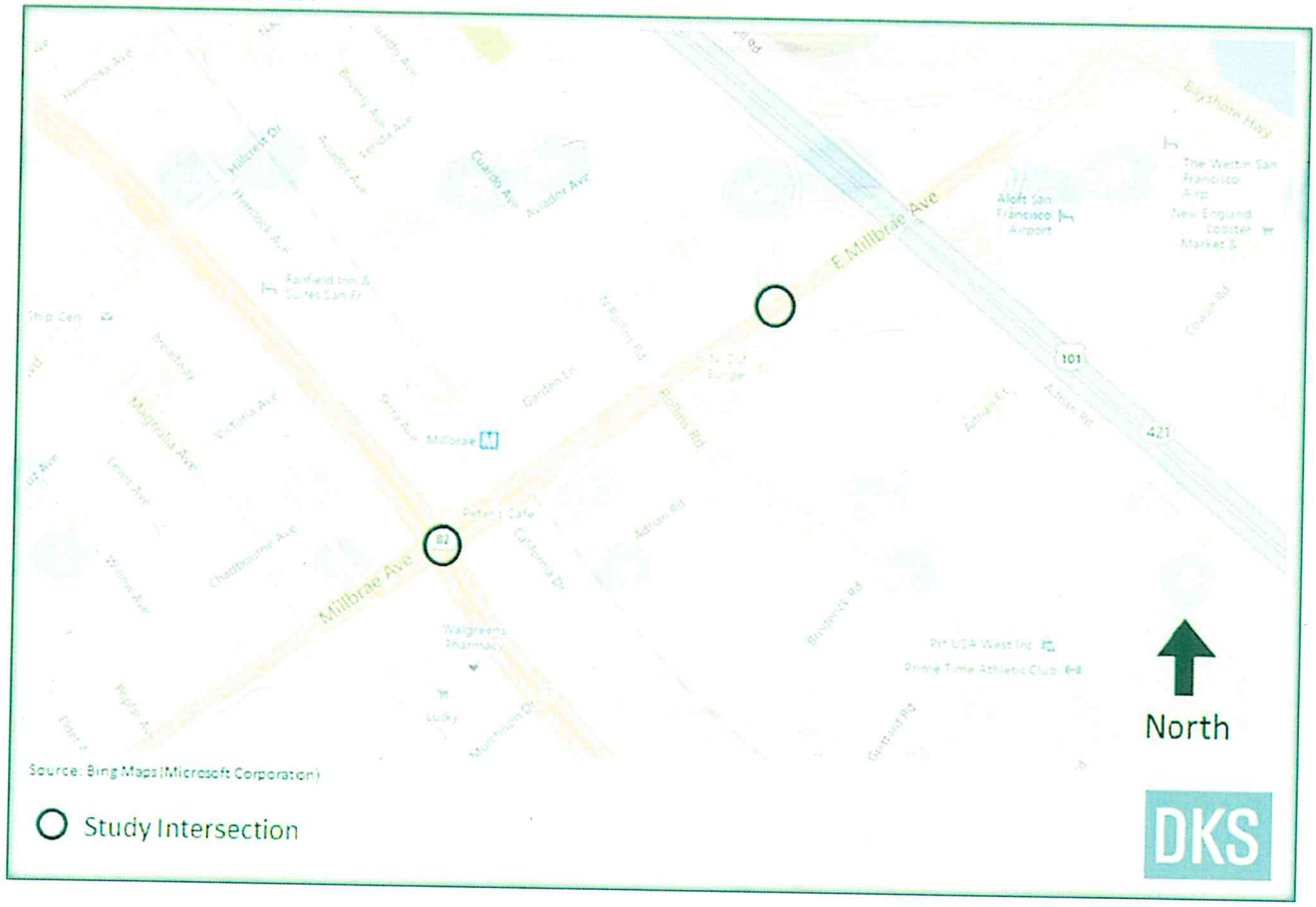
ARLE is equipped for the southbound left-turn at the intersection of El Camino Real / Millbrae Avenue and for the all southbound movements at the intersection of US101 Southbound Off-ramp / Millbrae Avenue. The ARLE system at the intersections of El Camino Real / Millbrae Avenue and US101 Southbound Off-ramp / Millbrae Avenue was installed and activated in November 2009. Photos of the ARLE equipment at each study intersection are provided in **Appendix A**.

Within the study area, the following roadway facilities are of note:

El Camino Real (SR-82) is a six-lane arterial that runs north-south through the study area and is parallel to US 101. The posted speed limit along this portion of El Camino Real is 35 MPH.

Millbrae Avenue is a primarily six-lane, east-west arterial that provides access between US 101 and El Camino Real. The posted speed limit of Millbrae Avenue is 35 MPH. The Millbrae Intermodal BART-Caltrain Station is located just north of Millbrae Avenue and uses the Rollins Road intersection as its primary access point.

FIGURE 1: STUDY AREA



ORIGINAL SIGNAL WARRANT

The study intersections at El Camino Real / Millbrae Avenue and US101 Southbound Off-ramp/Millbrae Avenue have been signalized for many decades. Because the intersections were signalized so many years ago, both governing agencies (The City of Millbrae or Caltrans) were not able to produce a copy of the original signal warrant.

SIGNAL TIMING

Signal timing sheets for the study intersections were provided by Caltrans District 4 staff and are included in **Appendix B**.

Determination of Yellow Change Interval

Observed yellow change intervals for the ARLE-equipped intersection approaches (southbound left at El Camino Real/Millbrae Avenue and southbound approach at US101 Southbound Off-ramp/Millbrae

Ave) were determined from a video survey of signal operation, taken during a recent weekday afternoon field visit conducted on March 8, 2016. These observed intervals were averaged and then compared with the required intervals, as specified by Section 4D.10 and Table 4D-102 in the California Edition of the Manual on Uniform Traffic Control Devices (CaMUTCD). **Table 1** summarizes this comparison for the relevant approaches at both study intersections.

TABLE 1: SUMMARY OF YELLOW CHANGE INTERVAL

Intersection and Approach	Observed Average Yellow Change Interval by Approach	Required Yellow Change Interval [1]
El Camino Real and Millbrae Ave (southbound left-turn)	3.9	3.6
US101 Southbound Off-ramp and Millbrae Ave (southbound left, right-turn)	3.6	3.6

[1] Posted speed limit along departure street was the controlling factor in determining the required yellow change interval.

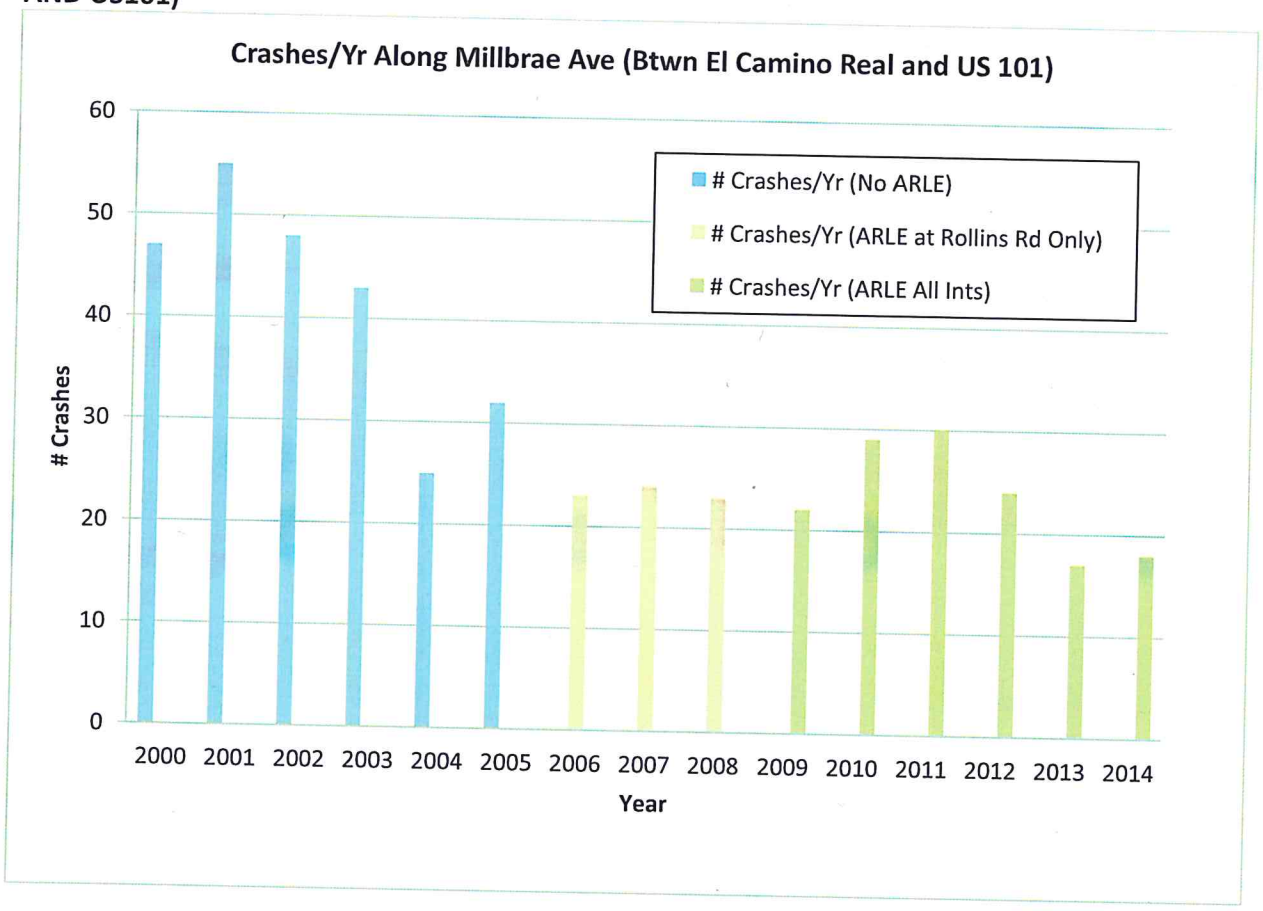
Based on a review of the video survey, DKS confirms that the observed yellow change interval for both ARLE installed movements satisfies the required yellow change intervals specified by the California MUTCD.

SAFETY PERFORMANCE

The City of Millbrae provided historical traffic counts along Millbrae Avenue for a multiday period in April 1999. DKS conducted new counts at the same location as the April 1999 counts on March 22, 2016. Using these two count sources, DKS estimated the Annual Average Daily Traffic and Vehicle Miles Traveled along Millbrae Avenue for each year between 1999 and 2015. Using crash history provided by the San Mateo County Sheriff's Department for the years 2000 through 2015, DKS estimated the crash rate for the study segment (including each ARLE equipped intersection).

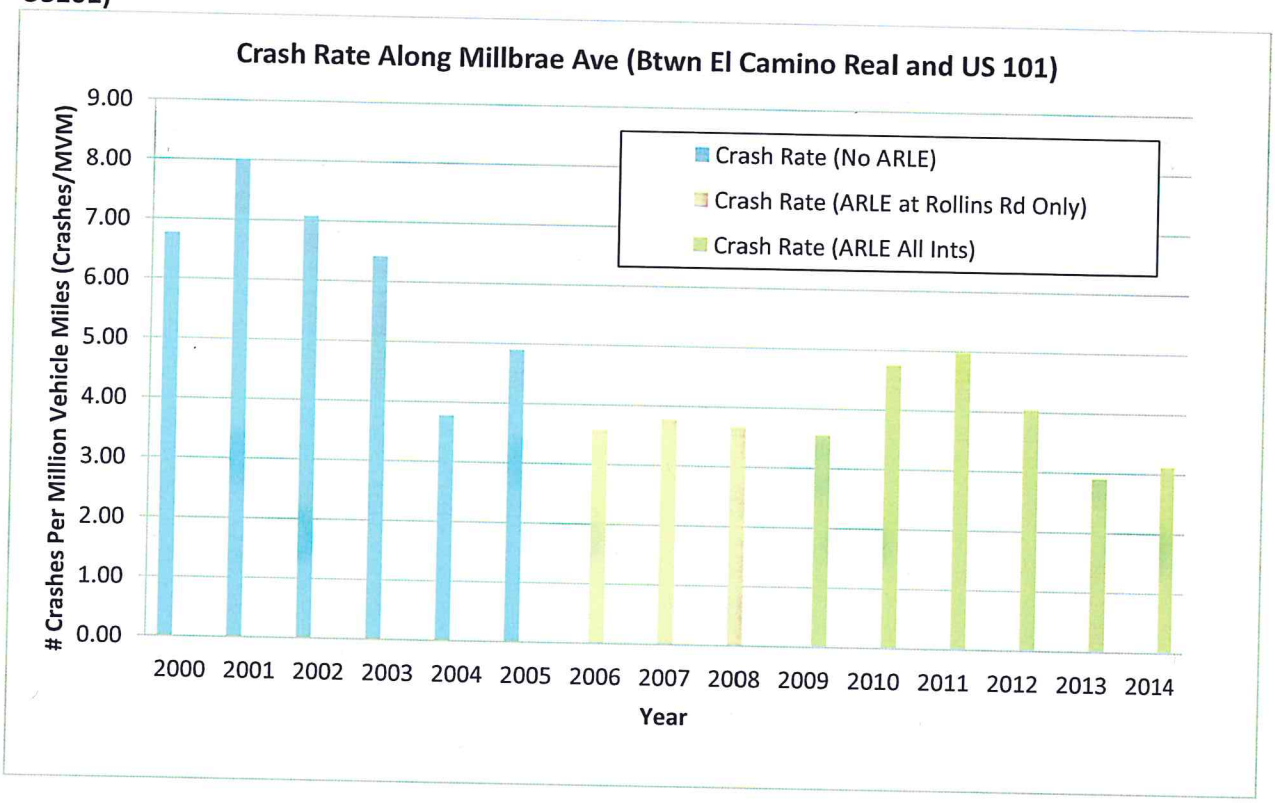
Figure 2 illustrates the number of total crashes. Figure 3 shows the yearly estimated crash rate. Summary of recorded crashes and traffic counts used are provided in **Appendices C and D**, respectively.

FIGURE 2: SUMMARY OF TOTAL CRASHES ALONG MILLBRAE AVENUE BETWEEN EL CAMINO REAL AND US101)



Source: City of Millbrae, San Mateo County Sheriff's Department, DKS, 2016.

FIGURE 3: SUMMARY OF CRASH RATE ALONG MILLBRAE AVENUE BETWEEN EL CAMINO REAL AND US101)



Source: City of Millbrae, San Mateo County Sheriff's Department, DKS, 2016.

The overall number of crashes per year are generally lower with the ARLE program in operation (years 2006 to 2014) than without the ARLE program (2000 to 2006). The average number of crashes per year for the six year period between 2000 and 2005 is 41.7 crashes per year. With the introduction of the ARLE system at the Rollins Road intersection (years 2006 to 2008), the average number of crashes per year lowers to 23.3 crashes per year. This number is lowered yet again with the addition of the intersections at El Camino Real and Southbound US101 off-ramp to an average of 21.1 crashes per year.

Similarly the average crash rate has generally decreased from 6.16 crashes per million-vehicle-miles without the ARLE program to 3.89 crashes per million-vehicle-miles with the ARLE program in operation. This is a higher rate than the reported statewide average rate of 1.48 as published by Caltrans in the 2012 Collision Data on California State Highways.

CONTACTING PARTIES FAMILIAR WITH THE INTERSECTION

DKS conducted a telephone interview with Deputy James Aboud from the San Mateo County Sheriff's Department regarding the operation and safety performance of the ARLE system along Millbrae Avenue. Deputy Aboud is a long-time current employee of the police department who has been on staff since the years prior to ARLE activation. According to Deputy Aboud, the activation of the ARLE system has contributed to greater lawfulness at these intersections. His personal observation is that since the ARLE program was activated in 2006/2009 that drivers are more cautious when driving along Millbrae Avenue and that he personally believes that the system has contributed to lower number of traffic violations as well as crashes.

FIELD REVIEW

DKS visited the study area during the afternoon of March 8, 2016. During this visit, DKS observed that drivers would approach each intersection normally without abrupt stopping to avoid a red light violation. At the intersection of the southbound US101 Off-ramp and Millbrae Avenue, DKS staff did observe some vehicles failing to come to a complete stop for the southbound right turn onto Millbrae Avenue. These "rolling stops" are a violation of California Vehicle Code (CVC) 21453c and may result in a citation being issued to the driver.

IDENTIFICATION AND EVALUATION OF PREVIOUS COUNTERMEASURES

A study commissioned by the Millbrae Police Department and conducted by American Traffic Solutions (ATS) showed that there were high rates of red light violations at the study intersections. Unfortunately, all copies of this report were lost when the Millbrae Police Department was merged with the San Mateo County Sheriff's Department in March 2012.

In an attempt to reduce the number of violations, the San Mateo County Sheriff's Department considered a traditional approach to improve safety by reducing traffic violations by increasing the presence of uniformed officers along the corridor. However, this was difficult to accomplish because this segment of Millbrae Avenue is rather constrained with narrow lanes and no shoulder. There are no places to safely pull violators over for traditional enforcement at any of the ARLE equipped intersections. To rely on traditional enforcement efforts in these areas present challenges in achieving law enforcement objectives and enhancing the safety for the motoring public.

The San Mateo County Sheriff's Department concluded that it would not be feasible for law enforcement to continuously monitor the intersections as effectively as the ARLE system does today. Even if it were possible to provide the same level of enforcement through traditional enforcement efforts, associated court appearances would make it difficult to staff daily patrol shifts. The cost to the

city to transition from automated to staffed enforcement would likely be extremely high. Even then, the current level of enforcement could not be maintained.

EVALUATION OF CITATIONS

The San Mateo County Sheriff's Department provided the citation records from the ARLE system. Citation records prior to 2009 were unavailable. All violation events are logged into the ARLE system and then reviewed by a trained San Mateo County Sheriff's Department Police Officer before citation is issued.

Table 2 below summarizes the total number of violation events vs actual citations issued for the study intersections ARLE system. A copy of the citation summary report is provided in **Appendix E.**

TABLE 2 – SUMMARY OF CITATIONS

Year	Number Citations Issued	
	El Camino Real at Millbrae Avenue	Southbound US101 Off-ramp at Millbrae Avenue
2009	317	1,006
2010	1,976	2,769
2011	1,743	2,368
2012	817	2,179
2013	1,377	1,121
2014	1,700	3,891
2015	1,710	4,418

Source: San Mateo County Sheriff's Department, 2016

Appendix A

Field Photos

Taken: March 2016

El Camino Real / Millbrae Avenue

Southbound US101 Off-ramp / Millbrae Avenue

Appendix B

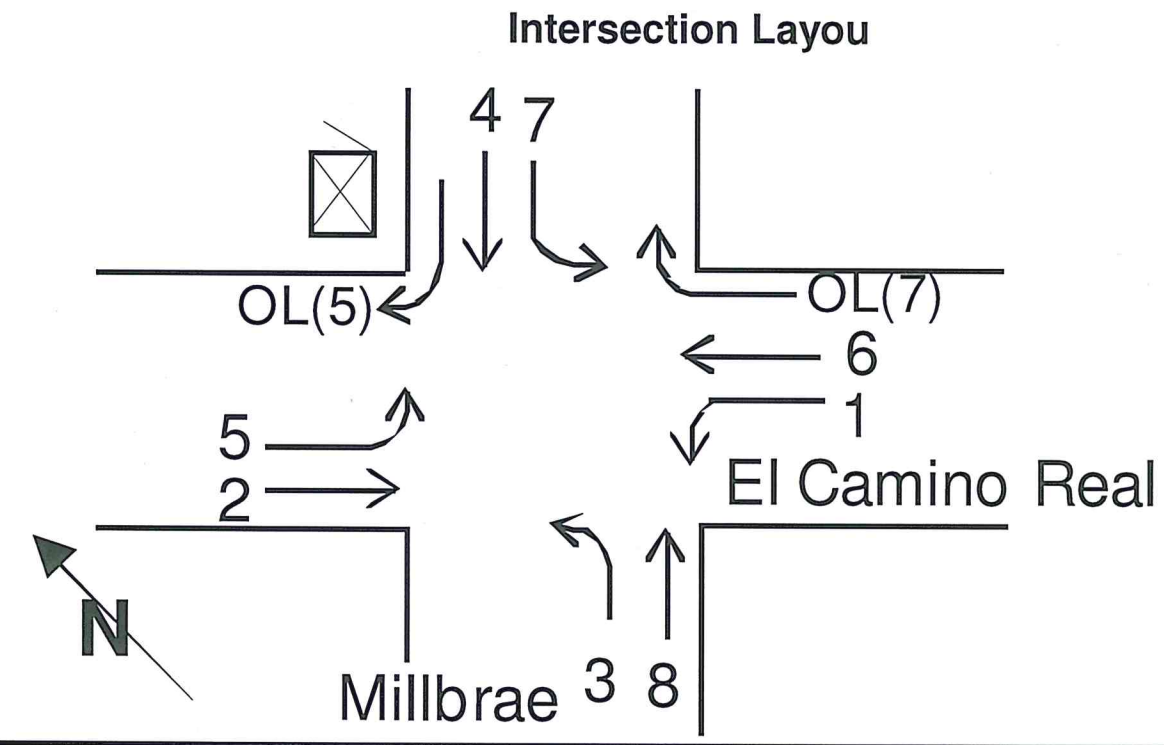
Signal Timing Sheets

Location: MILLBRAE AVE & EL CAMINO REAL
System: **District:**
Master At: **I/C:**

Designed By:
Installed By:
Service Info:

Timing Change: **Date Start:** **Date End:** **Designed:** **Installed:**

		FLASH
PHASE	1)	[R]
	2)	[R]
	3)	[R]
	4)	[R]
	5)	[R]
	6)	[R]
	7)	[R]
	8)	[R]
OVERLAP	A)	[ ]
	B)	[ ]
	C)	[ ]
	D)	[ ]
	E)	[ ]
	F)	[ ]



Comments and Notes:
TSCP 2.20 (BUILD 120) - 12/24/2014
Connected to Central Systems via Network Port thru Actelis ML684 (Port 4)

RAM Checksum

Page 2: 636C	Page 8: 85AF
Page 3: 1B0E	Page 9: B205
Page 4: F29E	Page 10: DCF0
Page 5: 191A	Page 11: C3CB
Page 6: 191A	Page 12: 8D98
Page 7: AE27	Page 13: 86F7

Post Mile: SM-082-15.946

Printed: 11/24/2015

CONFIGURATION PHASE FLAGS

Phases (2-1-1-1)	
Permitted	1 2 3 4 5 6 7 8
Restricted	. . . . .

Phase Recalls (2-1-1-2)	
Vehicle Min	. 2 . . . 6 . .
Vehicle Max	. . . . .
Pedestrian	. . . . .
Bicycle	. . . . .

Phase Locks (2-1-1-3)	
Red	. . . . .
Yellow	. . . . .
Force/Max	. . . . .

Phase Features (2-1-1-4)	
Double Entry	. 2 . 4 . 6 . 8
Rest In Walk	. . . . .
Rest In Red	. . . . .
Walk 2	. . . . .
Max Green 2	. . . . .
Max Green 3	. . . . .

Startup (2-1-1-5)	
First Green Phases	. 2 . . . 6 . .
Yellow Start Phases	. . . . .
Vehicle Calls	1 2 3 4 5 6 7 8
Pedestrian Calls	. 2 . 4 . 6 . 8
Yellow Start Overlaps	. . . . .
Startup All-Red	5.0

Call To Phase (2-1-2-1)		Omit On Green	
1	. . . . .	1	. . . . .
2	. . . . .	2	. . . . .
3	. . . . .	3	. . . . .
4	. . . . .	4	. . . . .
5	. . . . .	5	. . . . .
6	. . . . .	6	. . . . .
7	. . . . .	7	. . . . .
8	. . . . .	8	. . . . .

Flashing Colors (2-1-2-2)	
Yellow Flash Phases	. . . . .
Yellow Flash Overlap	. . . . .
Flash In Red Phases	. . . . .
Flash In Red Overlap	. . . . .

Special Operation (2-1-2-3)	
Single Exit Phase	. . . . .
Driveway Signal Phases	. . . . .
Driveway Signal Overlaps	. . . . .
Leading Ped Phases	. . . . .

Protected Permissive (2-1-2-4)	
Protected Permissive	. . . . .

Pedestrian (2-1-3)	
P1	. . . . .
P2	. 2 . . . . .
P3	. . . . .
P4	. . . 4 . . . .
P5	. . . . .
P6	. . . . . 6 . .
P7	. . . . .
P8	 8

Overlap (2-1-4)				
Overlap	Parent	Omit	No Start	Not
A	. . . . .	. . . . .	. . . . .	. . . . .
B	. . . . .	. . . . .	. . . . .	. . . . .
C	. . . . .	. . . . .	. . . . .	. . . . .
D	. . . . .	. . . . .	. . . . .	. . . . .
E	. . . . .	. . . . .	. . . . .	. . . . .
F	. . . . .	. . . . .	. . . . .	. . . . .

PHASE TIMING

Phase (2-2)	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
--- Walk 1 ---	0	5	0	5	0	5	0	5
Flash Don't Walk	0	23	0	37	0	33	0	34
Minimum Green	5	10	5	8	8	10	5	8
Det Limit	0	20	0	0	0	20	0	0
Max Initial	0	0	0	0	0	0	0	0
Max Green 1	13	25	15	25	25	25	25	25
Max Green 2	50	50	50	50	45	50	45	50
Max Green 3	50	50	50	50	50	50	50	50
Extension	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum Gap	2.0	4.0	2.0	2.0	2.0	4.0	2.0	2.0
Minimum Gap	1.0	3.0	1.2	1.2	1.0	3.0	1.0	1.0
Add Per Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Reduce Gap By	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Reduce Every	1.0	1.2	1.0	1.0	1.0	1.0	1.0	1.0
Yellow	3.0	4.0	3.0	3.6	3.6	4.0	3.0	3.6
All-Red	0.0	0.5	0.5	0.5	2.0	0.5	1.5	0.5
Ped/Bike (2-3)	**-1-**	**-2-**	**-3-**	**-4-**	**-5-**	**-6-**	**-7-**	**-8-**
--- Walk 2 ---	0	0	0	0	0	0	0	0
Delay/Early Walk	0	0	0	0	0	0	0	0
Solid Don't Walk	0	0	0	0	0	0	0	0
Bike Green	0	0	0	0	0	0	0	0
Bike All-Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

OVERLAP TIMING

Overlap (2-4)	A	B	C	D	E	F
Green	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	5.0	5.0	5.0	5.0	5.0	5.0
Red	0.0	0.0	0.0	0.0	0.0	0.0

Red Revert

Red Revert (2-5)	
Time	2.0
All-Red Sec/Min (2-6)	
All-Red Sec/Min:	SEC

Max 2 Extension

Max/Gap Out (2-7)	
Max Cnt	0
Gap Cnt	0

Local Plan 1...9 (7-1) TIMING DATA

COORDINATION

[Offsets] Green Factors or Press [F] to Select Force-Off

		Cycle	Multi	Lag Gap	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Plan 1	Green Factor														
Plan 2	Green Factor														
Plan 3	Green Factor														
Plan 4	Green Factor														
Plan 5	Green Factor														
Plan 6	Green Factor														
Plan 7	Green Factor														
Plan 8	Green Factor														
Plan 9	Green Factor														

Master Timer Sync (7-A)	
Enable in Plans	
1-9	.....
11-19	.....
21-29	.....

Master Sub Master	
Input	
Output	

FREE PLAN PHASE FLAGS

(7-E) Free	
Lag	Omit
.2.4.6.8	.....
Veh Min	Veh Max
.2...6..	.....
Ped	Bike
.....	.....
Cond	Cond Grn
.....	10

Local Plan 1...9 (7-1) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 1	.....	.....	.....	.....	.....	.....	.....	.....
Plan 2	.....	.....	.....	.....	.....	.....	.....	.....
Plan 3	.....	.....	.....	.....	.....	.....	.....	.....
Plan 4	.....	.....	.....	.....	.....	.....	.....	.....
Plan 5	.....	.....	.....	.....	.....	.....	.....	.....
Plan 6	.....	.....	.....	.....	.....	.....	.....	.....
Plan 7	.....	.....	.....	.....	.....	.....	.....	.....
Plan 8	.....	.....	.....	.....	.....	.....	.....	.....
Plan 9	.....	.....	.....	.....	.....	.....	.....	.....

MANUAL COMMANDS

Manual Plan (4-1)	
Plan	OffSet
	A

Plan: 1-9
15 or 254 = Flash
14 or 255 = Free
Offset A, B, or C

Special Function Override (4-2)			
#	Control	#	Control
1	NORMAL	3	NORMAL
2	NORMAL	4	NORMAL

Detector Reset	(4-3)
Local Manual (4-4)	OFF

Local Plan 11...19 (7-2) TIMING DATA

COORDINATION

[Offsets] Green Factors or Press [F] to Select Force-Off

		Cycle	Multi	Lag Gap	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Plan 11	Green Factor														
Plan 12	Green Factor														
Plan 13	Green Factor														
Plan 14	Green Factor														
Plan 15	Green Factor														
Plan 16	Green Factor														
Plan 17	Green Factor														
Plan 18	Green Factor														
Plan 19	Green Factor														

Local Plan 11...19 (7-2) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 11	.....	.....	.....	.....	.....	.....	.....	.....
Plan 12	.....	.....	.....	.....	.....	.....	.....	.....
Plan 13	.....	.....	.....	.....	.....	.....	.....	.....
Plan 14	.....	.....	.....	.....	.....	.....	.....	.....
Plan 15	.....	.....	.....	.....	.....	.....	.....	.....
Plan 16	.....	.....	.....	.....	.....	.....	.....	.....
Plan 17	.....	.....	.....	.....	.....	.....	.....	.....
Plan 18	.....	.....	.....	.....	.....	.....	.....	.....
Plan 19	.....	.....	.....	.....	.....	.....	.....	.....

Local Plan 21...29 (7-3) TIMING DATA

COORDINATION

[Offsets] Green Factors or Press [F] to Select Force-Off

		Cycle	Multi	Lag Gap	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Plan 21	Green Factor														
Plan 22	Green Factor														
Plan 23	Green Factor														
Plan 24	Green Factor														
Plan 25	Green Factor														
Plan 26	Green Factor														
Plan 27	Green Factor														
Plan 28	Green Factor														
Plan 29	Green Factor														

Local Plan 21...29 (7-3) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 21	.....	.....	.....	.....	.....	.....	.....	.....
Plan 22	.....	.....	.....	.....	.....	.....	.....	.....
Plan 23	.....	.....	.....	.....	.....	.....	.....	.....
Plan 24	.....	.....	.....	.....	.....	.....	.....	.....
Plan 25	.....	.....	.....	.....	.....	.....	.....	.....
Plan 26	.....	.....	.....	.....	.....	.....	.....	.....
Plan 27	.....	.....	.....	.....	.....	.....	.....	.....
Plan 28	.....	.....	.....	.....	.....	.....	.....	.....
Plan 29	.....	.....	.....	.....	.....	.....	.....	.....

DETECTORS

Detector Attributes (5-1)

Det	Type	Phases	Lock	Slot
1	COUNT+CALL+EXTEND	1.....	NO	I1U
2	COUNT+CALL+EXTEND	1.....	NO	I1L
3	COUNT+CALL+EXTEND	.2.....	NO	I2U
4	COUNT+CALL+EXTEND	.2.....	NO	I2L
5	COUNT+CALL+EXTEND	.2.....	NO	I3U
6	CALL+EXTEND	.2.....	NO	I3L
7	LIMITED	.2.....	NO	I4U
8	COUNT+CALL+EXTEND	.2.....	NO	I4L
9	COUNT+CALL+EXTEND	..3....	NO	I5U
10	COUNT+CALL+EXTEND	..3....	NO	I5L
11	COUNT+CALL+EXTEND	...4...	NO	I6U
12	COUNT+CALL+EXTEND	...4...	NO	I6L
13	COUNT+CALL+EXTEND	....5..	NO	I7U
14	CALL+EXTEND	....5..	NO	I7L
15	CALL+EXTEND	...4...	NO	I8U
16	COUNT+CALL+EXTEND	...4...	NO	I8L
17	COUNT+CALL+EXTEND	1.....	NO	I9U
18	COUNT+CALL+EXTEND	..3....	NO	I9L
19	COUNT+CALL+EXTEND	.2.....	NO	I10U
20	COUNT+CALL+EXTEND	...4...	NO	I10L
21	COUNT+CALL+EXTEND	....5..	NO	J1U
22	COUNT+CALL+EXTEND	....5..	NO	J1L
23	COUNT+CALL+EXTEND	.....6.	NO	J2U
24	COUNT+CALL+EXTEND	.....6.	NO	J2L
25	COUNT+CALL+EXTEND	.....6.	NO	J3U
26	CALL+EXTEND	7	NO	J3L
27	LIMITED	.....6.	NO	J4U
28	COUNT+CALL+EXTEND	.....6.	NO	J4L
29	COUNT+CALL+EXTEND	7	NO	J5U
30	COUNT+CALL+EXTEND	7	NO	J5L
31	COUNT+CALL+EXTEND	8	NO	J6U
32	COUNT+CALL+EXTEND	8	NO	J6L
33	COUNT+CALL+EXTEND	8	NO	J7U
34	CALL+EXTEND	8	NO	J7L
35	LIMITED	8	NO	J8U
36	COUNT+CALL+EXTEND	8	NO	J8L
37	COUNT+CALL+EXTEND	....5...	NO	J9U
38	COUNT+CALL+EXTEND	....5...	NO	J9L
39	COUNT+CALL+EXTEND	.....6..	NO	J10U
40	COUNT+CALL+EXTEND	8	NO	J10L
41	PEDESTRIAN	.2.....	NO	I12U
42	PEDESTRIAN	...4....	NO	I12L
43	PEDESTRIAN	.....6..	NO	I13U
44	PEDESTRIAN	8	NO	I13L

Detector Configuration (5-2)

Det	Delay	Extend	Recall	Port
1			10	3.2
2			10	7.2
3			10	1.1
4			10	1.5
5			10	4.5
6			10	6.2
7			10	2.1
8			10	7.4
9			10	3.4
10			10	7.6
11		0.5	10	1.3
12		0.5	10	1.7
13		1.0	10	4.7
14		1.0	10	6.4
15			10	2.3
16			10	7.8
17			10	3.6
18			10	3.8
19			10	4.1
20			10	4.2
21			10	3.1
22			10	7.1
23		0.8	10	1.2
24		0.8	10	1.6
25		0.8	10	4.6
26			10	6.3
27			10	2.2
28			10	7.3
29			10	3.3
30			10	7.5
31		0.5	10	1.4
32		0.5	10	1.8
33			10	4.8
34	15		10	6.5
35			10	2.4
36			10	7.7
37			10	3.5
38			10	3.7
39			10	4.3
40			10	4.4
41			10	5.1
42			10	5.3
43			10	5.2
44			10	5.4

Failure Times(5-3)	Minutes
Maximum On Time	
Fail Reset Time	

Failure Override (5-4)	
Detectors 1-8	.....
Detectors 9-16	.....
Detectors17-24	.....
Detectors 25-32	.....
Detectors 33-40	.....
Detectors 41-44	.....

System Detector Assignment (5-5)

Sys Det	1	2	3	4	5	6	7	8
Det Nu								
Sys Det	9	10	11	12	13	14	15	16
Det Nu								

CIC Operation (5-6-1)

Enable in Plans	.....

CIC Values (5-6-2)	Volume	Occupancy	Demand
Smoothing	0.66	0.66	0.66
Multiplier	4.0	0.33	
Exponent	0.50	1.00	

Detector-to-Phase Assignment (5-6-3)

Sys Det	1	2	3	4	5	6	7	8
Phase								
Sys Det	9	10	11	12	13	14	15	16
Phase								

Input File Port-Bit Assignments

332 Cabinet - For Reference Only

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
I-	3.2	1.1	4.5	2.1	3.4	1.3	4.7	2.3	3.6	4.1	6.6	5.1	5.2	6.7
	7.2	1.5	6.2	7.4	7.6	1.7	6.4	7.8	3.8	4.2	2.7	5.3	5.4	6.8
J-	3.1	1.2	4.6	2.2	3.3	1.4	4.8	2.4	3.5	4.3	2.8	5.5	5.6	2.5
	7.1	1.6	6.3	7.3	7.5	1.8	6.5	7.7	3.7	4.4	6.1	5.7	5.8	2.6

TOD SCHEDULE

Table 1 (8-2-1)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 2 (8-2-2)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 3 (8-2-3)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 4 (8-2-4)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 5 (8-2-5)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 6 (8-2-6)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

WEEKDAY ASSIGNMENT

Weekday Table Assignments (8-2-7)						
Mon	Tue	Wed	Thu	Fri	Sat	Sun
1	1	1	1	1	2	2

HOLIDAY TABLES

Floating Holiday Table (8-2-8)

#	Mnth	Week	DOW	Table
1			.....	
2			.....	
3			.....	
4			.....	
5			.....	
6			.....	
7			.....	
8			.....	
9			.....	
10			.....	
11			.....	
12			.....	
13			.....	
14			.....	
15			.....	
16			.....	

Fixed Holiday Table (8-2-9)

#	Mnth	Day	DOW	Table
1			.....	
2			.....	
3			.....	
4			.....	
5			.....	
6			.....	
7			.....	
8			.....	
9			.....	
10			.....	
11			.....	
12			.....	
13			.....	
14			.....	
15			.....	
16			.....	

Solar Clock Data (8-4)

North Latitude	34
West Longitude	118
Local Time Zone	8

Sabbatical Clock (8-5)

Hebrew	Ped Recall
Sabbath	.....
Holiday	.....

Daylight Saving (8-6)

Enabled	YES

TOD FUNCTIONS

TOD Functions (8-3)

#	Start	End	DOW	Action	Phases
1	0700	1900	M T W T F S S	17	....5.7.
2			.....		.....
3			.....		.....
4			.....		.....
5			.....		.....
6			.....		.....
7			.....		.....
8			.....		.....
9			.....		.....
10			.....		.....
11			.....		.....
12			.....		.....
13			.....		.....
14			.....		.....
15			.....		.....
16			.....		.....

Action Codes:

0. None
1. Permitted
2. Restricted
4. Veh Min Recall
5. Veh Max Recall
6. Ped Recall
7. Bike Recall
8. Red Lock
9. Yellow Lock
10. Force/Max Lock
11. Double Entry
12. Y-Coord C
13. Y-Coord D
14. Free
15. Flashing
16. Walk 2
17. Max Green 2
18. Max Green 3
19. Rest in Walk
20. Rest in Red
21. Free Lag Phases
22. Special Functions
23. Truck Preempt
24. Conditional Service
25. Conditional Service
26. Leading Ped
27. Traffic Actuated Max 2
41. Protected Permissive
42. Protected Permissive

Action Code = Phases added to normal setting

100+Action Code = Phases removed

200+Action Code = Phases replaced

COMMUNICATIONS

C2 (6-1-1)	
Address	3
Protocol	AB3418
Limit Access	0
Baud	9600
Parity	NONE
Data Bits	8
Stop Bits	1
RTS On Time	20
RTS Off Time	20
Handshaking	NORMAL

C20 (6-1-2)	
Address	
Protocol	AB3418
Limit Access	0
Baud	1200
Parity	NONE
Data Bits	8
Stop Bits	1
RTS On Time	20
RTS Off Time	20
Handshaking	NORMAL

C21 (6-1-3)	
Address	
Protocol	AB3418
Limit Access	0
Baud	1200
Parity	NONE
Data Bits	8
Stop Bits	1
RTS On Time	20
RTS Off Time	20
Handshaking	NORMAL

Limit Access:
0-None
1-Status Only
2-Status, Set Pattern, Time
3-Status, Set Pattern, Time, Manual Plan

SOFT LOGIC

Soft Logic (6-2)

#	Data	OP	Data	OP	Data	OP	Data
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							

*Refer to User's Manual for Data and OP Codes

CALLBACK NUMBERS

Callback Numbers (6-3...3)	
Line Out	
Local Toll	
Long Distance	
Delay	10
Area Code	
Phone Number	

Line Out	
Local Toll	
Long Distance	
Delay	10
Area Code	
Phone Number	

Line Out	
Local Toll	
Long Distance	
Delay	10
Area Code	
Phone Number	

NETWORK

Network (6-4)	
Address	1
Protocol	AB3418
Port	27000
IP Mode	STATIC

IP Address	172	.	22	.	8	.	41
Netmask	255	.	255	.	255	.	0
Broadcast	0	.	0	.	0	.	254
Gateway	172	.	22	.	8	.	1

RAILROAD PREEMPTION

RR 1

(3-1-1)	Timing	Phase Flags (3-1-2)			Pedestrian Flags (3-1-3)			Overlap Flags (3-1-4)		
		Grn Hold	Yel Flash	Red Flash	Walk	Flash DW	Solid DW	Grn Hold	Yel Flash	Red Flash
Delay										
Clear 1	10	.2..5...	.....	.....	.....	.....	.2.4.6.8	.....	.....	.....
Clear 2		.....	.....	.....	.....	.....	.....	.....	.....	.....
Clear 3		.....	.....	.....	.....	.....	.....	.....	.....	.....
Hold		.....	.....	12345678	.....	.....	.....	.....	.....	ABCDEF
Exit										
Min Grn										
Ped Clr										

Exit Parameters (3-1-5)

Phase Green	Overlap Green	Vehicle Call	Ped Call
.....	.....	12345678	.2.4.6.8

Configuration (3-1-6)

Port	Gate Port	Latching	Power-Up
2.5	0.0	YES	FLASHING

RR 2

(3-2-1)	Timing	Phase Flags (3-2-2)			Pedestrian Flags (3-2-3)			Overlap Flags (3-2-4)		
		Grn Hold	Yel Flash	Red Flash	Walk	Flash DW	Solid DW	Grn Hold	Yel Flash	Red Flash
Delay										
Clear 1	10	...4..7.	.....	.....	.....	.....	.2.4.6.8	.....	.....	.....
Clear 2		.....	.....	.....	.....	.....	.....	.....	.....	.....
Clear 3		.....	.....	.....	.....	.....	.....	.....	.....	.....
Hold		123..6..	.....	.....	.2...6..	.....	...4...8	.....	.....	.....
Exit										
Min Grn										
Ped Clr										

Exit Parameters (3-2-5)

Phase Green	Overlap Green	Vehicle Call	Ped Call
.....	.....	...4..7.	.....

Configuration (3-2-6)

Port	Gate Port	Latching	Power-up
2.6	0.0	YES	DARK

EMERGENCY VEHICLE PREEMPTION

EVA (3-A)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	30	30	.2..5...	.....

Port	Latching	Phase Termination
5.5	NO	ADVANCE

EVB (3-B)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	30	30	...4..7.	.....

Port	Latching	Phase Termination
5.6	NO	ADVANCE

EVC (3-C)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	30	30	1....6..	.....

Port	Latching	Phase Termination
5.7	NO	ADVANCE

EVD (3-D)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	30	30	..3....8	.....

Port	Latching	Phase Termination
5.8	NO	ADVANCE

INPUTS

		7 Wire I/C (2-1-5-1)			
		Input	Port	Input	Port
Enable	NO	R1	3.8	Free	3.6
Max ON		R2	3.5	D2	2.8
Max OFF		R3	3.7	D3	6.1

Manual Control (2-1-5-2)	
Input	Port
Manual Advance	6.6
Advance Enable	6.6

Cabinet Status (2-1-5-3)	
Input	Port
Flash Bus	
Door Ajar	
Flash Sense	6.7
Stop Time	6.8

Special Function (2-1-5-4)	
Input	Port
1	
2	
3	
4	

Battery Backup (2-1-5-5)	
Port	Operation
	NORMAL

Y-Coordination (2-1-5-6)	
Port C	Port D
6.1	2.8

OUTPUTS

Loadswitch Assignments (2-1-6)							+
A	1	2	22	3	4	24	9
B	5	6	26	7	8	28	10
X	13	14	0	11	12	0	0

Loadswitch Codes:

0 Unused (no output)
1-8 Vehicle 1-8
9-14 Overlap A-F
21-28 Ped 1-8
41-47 Special Functions
41 Protected Permissive Flashing Phase 1
43 Protected Permissive Flashing Phase 3
45 Protected Permissive Flashing Phase 5
47 Protected Permissive Flashing Phase 7
51-57 Special Functions
71-72 Seven Wire I/C

+ middle output of loadswitches 3 and 6
Channel 9 and 10

TRANSIT PRIORITY

Local Plans (3-E) 1...9 11...19		Early Green	Green Extend	Inhibit Cycles	Phase 1 Minimum	Phase 2 Minimum	Phase 3 Minimum	Phase 4 Minimum	Phase 5 Minimum	Phase 6 Minimum	Phase 7 Minimum	Phase 8 Minimum
Plan 1	Green Factor											
Plan 2	Green Factor											
Plan 3	Green Factor											
Plan 4	Green Factor											
Plan 5	Green Factor											
Plan 6	Green Factor											
Plan 7	Green Factor											
Plan 8	Green Factor											
Plan 9	Green Factor											
Plan 11	Green Factor											
Plan 12	Green Factor											
Plan 13	Green Factor											
Plan 14	Green Factor											
Plan 15	Green Factor											
Plan 16	Green Factor											
Plan 17	Green Factor											
Plan 18	Green Factor											
Plan 19	Green Factor											

Transit Priority Configuration (3-E-A)				Indicator Output	
Enable in Plans		Input	Type	Stop	Go
Plan 1-9	.....	0.0	OPT	0	0
Plan 11-19	.....	0.0	OPT	0	0

Queue Jump (3-E-B)	
Grn Hold	Hold Phase
	.....
	.....

Free Plans (3-E-E)	
Max Grn Hold	Hold Phase
	.....

Access Utilities (9-5)	
Password	***
Timeout	30

YELLOW YIELD COORDINATION

					Force-Offs											
Y-Coord Plans (7-C,D)	Long Grn	No Grn	Offset	Perm	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	Coord	Lag	Min Recall	Restricted
Plan C													.2...6..	.2.4.6.8	.....	.....
Plan D													.2...6..	.2.4.6.8	.....	.....

TRUCK PRIORITY

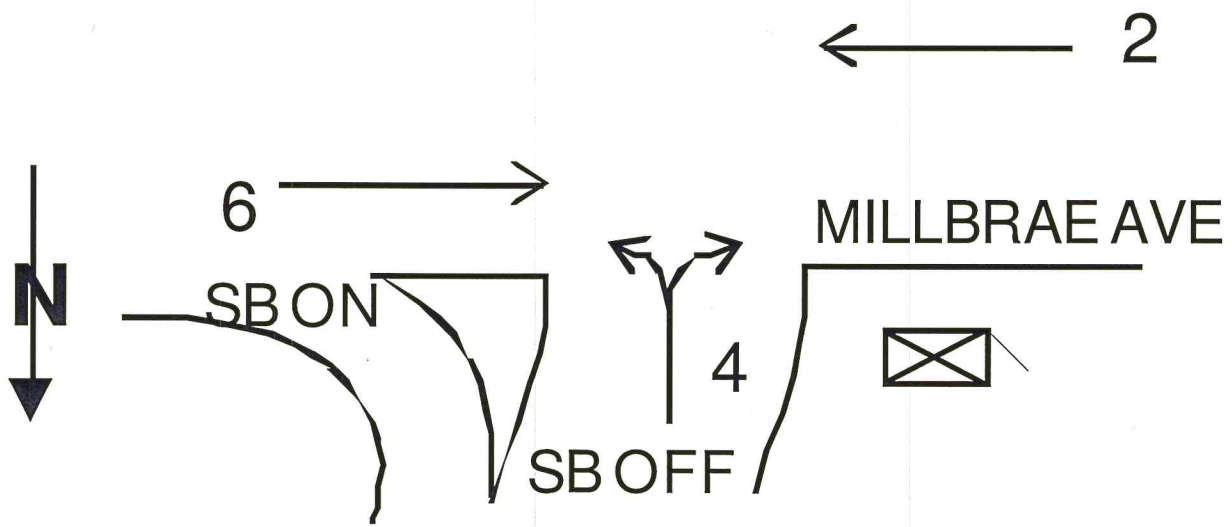
Truck Priority (3-F)	Passage	CarryOver	Clearance	Next Priority	Phase Green	Det 2 Port	Det 3 Port	Det 4 Port	Sign Output	Slave Input	Slave Output
					.....	0.0	0.0	0.0	0	0.0	0

Location: MILLBRAE AVE & RTE 101 SB RAMPS
System: **District:** 04
Master At: **I/C:**
Designed By:
Installed By:
Service Info:

Timing Change: **Date Start:** **Date End:** **Designed:** **Installed:**

		FLASH
PHASE	1)	[ ]
	2)	[R]
	3)	[ ]
	4)	[R]
	5)	[ ]
	6)	[R]
	7)	[ ]
	8)	[ ]
OVERLAP	A)	[ ]
	B)	[ ]
	C)	[ ]
	D)	[ ]
	E)	[ ]
	F)	[ ]

Intersection Layou



Comments and Notes:
TSCP 2.20 (BUILD 120) – 07/21/2015
Connected to Central Systems Via Network Port thru Hirschman Switch (Port 8)

RAM Checksum

Page 2: 2502	Page 8: 85AF
Page 3: 3F2C	Page 9: 1F3A
Page 4: F29E	Page 10: 9619
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Page 6: 191A	Page 12: EF20
Page 7: 8796	Page 13: 33F6

Post Mile: SM-101-17.963

Printed: 12/1/2015

CONFIGURATION PHASE FLAGS

Phases (2-1-1-1)	
Permitted	. 2 . 4 . 6 . .
Restricted	. . . . .

Phase Recalls (2-1-1-2)	
Vehicle Min	. 2 . . . 6 . .
Vehicle Max	. . . . .
Pedestrian	. . . . .
Bicycle	. . . . .

Phase Locks (2-1-1-3)	
Red	. . . . .
Yellow	. . . . .
Force/Max	. . . . .

Phase Features (2-1-1-4)	
Double Entry	. 2 . . . 6 . .
Rest In Walk	. . . . .
Rest In Red	. . . . .
Walk 2	. . . . .
Max Green 2	. . . . .
Max Green 3	. . . . .

Startup (2-1-1-5)	
First Green Phases	. 2 . . . 6 . .
Yellow Start Phases	. . . . .
Vehicle Calls	. 2 . 4 . 6 . .
Pedestrian Calls	. . . . .
Yellow Start Overlaps	. . . . .
Startup All-Red	5.0

Call To Phase (2-1-2-1)		Omit On Green	
1	. . . . .	1	. . . . .
2	. . . . .	2	. . . . .
3	. . . . .	3	. . . . .
4	. . . . .	4	. . . . .
5	. . . . .	5	. . . . .
6	. . . . .	6	. . . . .
7	. . . . .	7	. . . . .
8	. . . . .	8	. . . . .

Flashing Colors (2-1-2-2)	
Yellow Flash Phases	. . . . .
Yellow Flash Overlap	. . . . .
Flash In Red Phases	. . . . .
Flash In Red Overlap	. . . . .

Special Operation (2-1-2-3)	
Single Exit Phase	. . . . .
Driveway Signal Phases	. . . . .
Driveway Signal Overlaps	. . . . .
Leading Ped Phases	. . . . .

Protected Permissive (2-1-2-4)	
Protected Permissive	. . . . .

Pedestrian (2-1-3)	
P1	. . . . .
P2	. . . . .
P3	. . . . .
P4	. . . . .
P5	. . . . .
P6	. . . . .
P7	. . . . .
P8	. . . . .

Overlap (2-1-4)				
Overlap	Parent	Omit	No Start	Not
A	. . . . .	. . . . .	. . . . .	. . . . .
B	. . . . .	. . . . .	. . . . .	. . . . .
C	. . . . .	. . . . .	. . . . .	. . . . .
D	. . . . .	. . . . .	. . . . .	. . . . .
E	. . . . .	. . . . .	. . . . .	. . . . .
F	. . . . .	. . . . .	. . . . .	. . . . .

PHASE TIMING

Phase (2-2)	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
--- Walk 1 ---	0	10	0	10	0	10	0	10
Flash Don't Walk	0	10	0	10	0	10	0	10
Minimum Green	10	10	10	6	10	10	10	10
Det Limit	10	16	10	0	10	16	10	10
Max Initial	10	0	10	0	10	0	10	10
Max Green 1	50	30	50	24	50	30	50	50
Max Green 2	50	50	50	50	50	50	50	50
Max Green 3	50	50	50	50	50	50	50	50
Extension	5.0	0.0	5.0	0.0	5.0	0.0	5.0	5.0
Maximum Gap	5.0	3.5	5.0	2.0	5.0	3.5	5.0	5.0
Minimum Gap	5.0	2.5	5.0	1.0	5.0	2.5	5.0	5.0
Add Per Vehicle	1.0	0.0	1.0	0.0	1.0	0.0	1.0	1.0
Reduce Gap By	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0
Reduce Every	1.0	1.2	1.0	0.8	1.0	1.2	1.0	1.0
Yellow	5.0	4.0	5.0	3.6	5.0	4.0	5.0	5.0
All-Red	1.0	0.0	1.0	0.0	1.0	0.0	1.0	1.0
Ped/Bike (2-3)	**-1-**	**-2-**	**-3-**	**-4-**	**-5-**	**-6-**	**-7-**	**-8-**
--- Walk 2 ---	0	0	0	0	0	0	0	0
Delay/Early Walk	0	0	0	0	0	0	0	0
Solid Don't Walk	0	0	0	0	0	0	0	0
Bike Green	0	0	0	0	0	0	0	0
Bike All-Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

OVERLAP TIMING

Overlap (2-4)	A	B	C	D	E	F
Green	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	5.0	5.0	5.0	5.0	5.0	5.0
Red	0.0	0.0	0.0	0.0	0.0	0.0

Red Revert

Red Revert (2-5)	
Time	2.0
All-Red Sec/Min (2-6)	
All-Red Sec/Min:	SEC

Max 2 Extension

Max/Gap Out (2-7)	
Max Cnt	0
Gap Cnt	0

Local Plan 1...9 (7-1) TIMING DATA

COORDINATION

[Offsets] Green Factors or Press [F] to Select Force-Off

		Cycle	Multi	Lag Gap	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Plan 1	Green Factor														
Plan 2	Green Factor														
Plan 3	Green Factor														
Plan 4	Green Factor														
Plan 5	Green Factor														
Plan 6	Green Factor														
Plan 7	Green Factor														
Plan 8	Green Factor														
Plan 9	Green Factor														

Master Timer Sync (7-A)	
Enable in Plans	
1-9	.....
11-19	.....
21-29	.....

Master Sub Master	
Input	
Output	

Local Plan 1...9 (7-1) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 1	.....	.....	.....	.....	.....	.....	.....	.....
Plan 2	.....	.....	.....	.....	.....	.....	.....	.....
Plan 3	.....	.....	.....	.....	.....	.....	.....	.....
Plan 4	.....	.....	.....	.....	.....	.....	.....	.....
Plan 5	.....	.....	.....	.....	.....	.....	.....	.....
Plan 6	.....	.....	.....	.....	.....	.....	.....	.....
Plan 7	.....	.....	.....	.....	.....	.....	.....	.....
Plan 8	.....	.....	.....	.....	.....	.....	.....	.....
Plan 9	.....	.....	.....	.....	.....	.....	.....	.....

FREE PLAN PHASE FLAGS

(7-E) Free	
Lag	Omit
.2.4.6.8	.....
Veh Min	Veh Max
.2...6..	.....
Ped	Bike
.....	.....
Cond	Cond Grn
.....	10

MANUAL COMMANDS

Manual Plan (4-1)	
Plan	OffSet
	A

Plan: 1-9
15 or 254 = Flash
14 or 255 = Free
Offset A, B, or C

Special Function Override (4-2)			
#	Control	#	Control
1	NORMAL	3	NORMAL
2	NORMAL	4	NORMAL

Detector Reset	(4-3)
Local Manual (4-4)	OFF

Local Plan 11...19 (7-2) TIMING DATA

COORDINATION

[Offsets] Green Factors or Press [F] to Select Force-Off

		Cycle	Multi	Lag Gap	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Plan 11	Green Factor														
Plan 12	Green Factor														
Plan 13	Green Factor														
Plan 14	Green Factor														
Plan 15	Green Factor														
Plan 16	Green Factor														
Plan 17	Green Factor														
Plan 18	Green Factor														
Plan 19	Green Factor														

Local Plan 11...19 (7-2) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 11	.....	.....	.....	.....	.....	.....	.....	.....
Plan 12	.....	.....	.....	.....	.....	.....	.....	.....
Plan 13	.....	.....	.....	.....	.....	.....	.....	.....
Plan 14	.....	.....	.....	.....	.....	.....	.....	.....
Plan 15	.....	.....	.....	.....	.....	.....	.....	.....
Plan 16	.....	.....	.....	.....	.....	.....	.....	.....
Plan 17	.....	.....	.....	.....	.....	.....	.....	.....
Plan 18	.....	.....	.....	.....	.....	.....	.....	.....
Plan 19	.....	.....	.....	.....	.....	.....	.....	.....

Local Plan 21...29 (7-3) TIMING DATA

COORDINATION

[Offsets] Green Factors or Press [F] to Select Force-Off

		Cycle	Multi	Lag Gap	A	B	C	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
Plan 21	Green Factor														
Plan 22	Green Factor														
Plan 23	Green Factor														
Plan 24	Green Factor														
Plan 25	Green Factor														
Plan 26	Green Factor														
Plan 27	Green Factor														
Plan 28	Green Factor														
Plan 29	Green Factor														

Local Plan 21...29 (7-3) PHASE FLAGS

	Lag	Sync	Hold	Omit	Veh Min	Veh Max	Ped	Bike
Plan 21	.....	.....	.....	.....	.....	.....	.....	.....
Plan 22	.....	.....	.....	.....	.....	.....	.....	.....
Plan 23	.....	.....	.....	.....	.....	.....	.....	.....
Plan 24	.....	.....	.....	.....	.....	.....	.....	.....
Plan 25	.....	.....	.....	.....	.....	.....	.....	.....
Plan 26	.....	.....	.....	.....	.....	.....	.....	.....
Plan 27	.....	.....	.....	.....	.....	.....	.....	.....
Plan 28	.....	.....	.....	.....	.....	.....	.....	.....
Plan 29	.....	.....	.....	.....	.....	.....	.....	.....

DETECTORS

Detector Attributes (5-1)

Det	Type	Phases	Lock	Slot
1	COUNT+CALL+EXTEND	1.....	NO	I1U
2	COUNT+CALL+EXTEND	1.....	NO	I1L
3	COUNT+CALL+EXTEND	.2.....	NO	I2U
4	COUNT+CALL+EXTEND	.2.....	NO	I2L
5	COUNT+CALL+EXTEND	.2.....	NO	I3U
6	LIMITED	.2.....	NO	I3L
7	LIMITED	.2.....	NO	I4U
8	COUNT+CALL+EXTEND	.2.....	NO	I4L
9	COUNT+CALL+EXTEND	..3....	NO	I5U
10	COUNT+CALL+EXTEND	..3....	NO	I5L
11	COUNT+CALL+EXTEND	...4...	NO	I6U
12	COUNT+CALL+EXTEND	...4...	NO	I6L
13	COUNT+CALL+EXTEND	...4...	NO	I7U
14	CALL+EXTEND	...4...	NO	I7L
15	CALL+EXTEND	...4...	NO	I8U
16	COUNT+CALL+EXTEND	...4...	NO	I8L
17	COUNT+CALL+EXTEND	1.....	NO	I9U
18	COUNT+CALL+EXTEND	..3....	NO	I9L
19	COUNT+CALL+EXTEND	.2.....	NO	I10U
20	COUNT+CALL+EXTEND	...4...	NO	I10L
21	COUNT+CALL+EXTEND	....5..	NO	J1U
22	COUNT+CALL+EXTEND	....5..	NO	J1L
23	COUNT+CALL+EXTEND	.....6.	NO	J2U
24	COUNT+CALL+EXTEND	.....6.	NO	J2L
25	COUNT+CALL+EXTEND	.....6.	NO	J3U
26	LIMITED	.....6.	NO	J3L
27	LIMITED	.....6.	NO	J4U
28	COUNT+CALL+EXTEND	.....6.	NO	J4L
29	COUNT+CALL+EXTEND	7	NO	J5U
30	COUNT+CALL+EXTEND	7	NO	J5L
31	COUNT+CALL+EXTEND	8	NO	J6U
32	COUNT+CALL+EXTEND	8	NO	J6L
33	COUNT+CALL+EXTEND	8	NO	J7U
34	CALL+EXTEND	8	NO	J7L
35	LIMITED	8	NO	J8U
36	COUNT+CALL+EXTEND	8	NO	J8L
37	COUNT+CALL+EXTEND	....5...	NO	J9U
38	COUNT+CALL+EXTEND	......7.	NO	J9L
39	COUNT+CALL+EXTEND	.....6..	NO	J10U
40	COUNT+CALL+EXTEND	8	NO	J10L
41	PEDESTRIAN	.2.....	NO	I12U
42	PEDESTRIAN	...4....	NO	I12L
43	PEDESTRIAN	.....6..	NO	I13U
44	PEDESTRIAN	8	NO	I13L

Detector Configuration (5-2)

Det	Delay	Extend	Recall	Port
1			10	3.2
2			10	7.2
3			10	1.1
4			10	1.5
5			10	4.5
6		0.5	10	6.2
7		0.5	10	2.1
8			10	7.4
9			10	3.4
10			10	7.6
11		1.5	10	1.3
12		1.5	10	1.7
13		1.5	10	4.7
14			10	6.4
15			10	2.3
16			10	7.8
17			10	3.6
18			10	3.8
19			10	4.1
20			10	4.2
21			10	3.1
22			10	7.1
23			10	1.2
24			10	1.6
25			10	4.6
26		0.5	10	6.3
27		0.5	10	2.2
28			10	7.3
29			10	3.3
30			10	7.5
31			10	1.4
32			10	1.8
33			10	4.8
34			10	6.5
35			10	2.4
36			10	7.7
37			10	3.5
38			10	3.7
39			10	4.3
40			10	4.4
41			10	5.1
42			10	5.3
43			10	5.2
44			10	5.4

Failure Times(5-3)	Minutes
Maximum On Time	
Fail Reset Time	

Failure Override (5-4)

Detectors 1-8	.....
Detectors 9-16	.....
Detectors17-24	.....
Detectors 25-32	.....
Detectors 33-40	.....
Detectors 41-44	.....

System Detector Assignment (5-5)

Sys Det	1	2	3	4	5	6	7	8
Det Nu								
Sys Det	9	10	11	12	13	14	15	16
Det Nu								

CIC Operation (5-6-1)

Enable in Plans	.....

CIC Values (5-6-2)	Volume	Occupancy	Demand
Smoothing	0.66	0.66	0.66
Multiplier	4.0	0.33	
Exponent	0.50	1.00	

Detector-to-Phase Assignment (5-6-3)

Sys Det	1	2	3	4	5	6	7	8
Phase								
Sys Det	9	10	11	12	13	14	15	16
Phase								

Input File Port-Bit Assignments

332 Cabinet - For Reference Only

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
I-	3.2	1.1	4.5	2.1	3.4	1.3	4.7	2.3	3.6	4.1	6.6	5.1	5.2	6.7
	7.2	1.5	6.2	7.4	7.6	1.7	6.4	7.8	3.8	4.2	2.7	5.3	5.4	6.8
J-	3.1	1.2	4.6	2.2	3.3	1.4	4.8	2.4	3.5	4.3	2.8	5.5	5.6	2.5
	7.1	1.6	6.3	7.3	7.5	1.8	6.5	7.7	3.7	4.4	6.1	5.7	5.8	2.6

TOD SCHEDULE

Table 1 (8-2-1)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 2 (8-2-2)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 3 (8-2-3)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 4 (8-2-4)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 5 (8-2-5)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

Table 6 (8-2-6)		
Time	Plan	OS
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A
		A

WEEKDAY ASSIGNMENT

Weekday Table Assignments (8-2-7)						
Mon	Tue	Wed	Thu	Fri	Sat	Sun
1	1	1	1	1	2	2

HOLIDAY TABLES

Floating Holiday Table (8-2-8)

#	Mnth	Week	DOW	Table
1			.....	
2			.....	
3			.....	
4			.....	
5			.....	
6			.....	
7			.....	
8			.....	
9			.....	
10			.....	
11			.....	
12			.....	
13			.....	
14			.....	
15			.....	
16			.....	

Fixed Holiday Table (8-2-9)

#	Mnth	Day	DOW	Table
1			.....	
2			.....	
3			.....	
4			.....	
5			.....	
6			.....	
7			.....	
8			.....	
9			.....	
10			.....	
11			.....	
12			.....	
13			.....	
14			.....	
15			.....	
16			.....	

Solar Clock Data (8-4)

North Latitude	34
West Longitude	118
Local Time Zone	8

Sabbatical Clock (8-5)

Hebrew	Ped Recall
Sabbath	.....
Holiday	.....

Daylight Saving (8-6)

Enabled	YES

TOD FUNCTIONS

TOD Functions (8-3)

#	Start	End	DOW	Action	Phases
1	0700	1900	M T W T F . .	17	...4....
2	0700	1900	M T W T F . .	13	.....
3			.....		.....
4			.....		.....
5			.....		.....
6			.....		.....
7			.....		.....
8			.....		.....
9			.....		.....
10			.....		.....
11			.....		.....
12			.....		.....
13			.....		.....
14			.....		.....
15			.....		.....
16			.....		.....

Action Codes:

0. None
1. Permitted
2. Restricted
4. Veh Min Recall
5. Veh Max Recall
6. Ped Recall
7. Bike Recall
8. Red Lock
9. Yellow Lock
10. Force/Max Lock
11. Double Entry
12. Y-Coord C
13. Y-Coord D
14. Free
15. Flashing
16. Walk 2
17. Max Green 2
18. Max Green 3
19. Rest in Walk
20. Rest in Red
21. Free Lag Phases
22. Special Functions
23. Truck Preempt
24. Conditional Service
25. Conditional Service
26. Leading Ped
27. Traffic Actuated Max 2
41. Protected Permissive
42. Protected Permissive

Action Code = Phases added to normal setting

100+Action Code = Phases removed

200+Action Code = Phases replaced

COMMUNICATIONS

C2 (6-1-1)	
Address	
Protocol	AB3418
Limit Access	0
Baud	1200
Parity	NONE
Data Bits	8
Stop Bits	1
RTS On Time	20
RTS Off Time	20
Handshaking	NORMAL

C20 (6-1-2)	
Address	
Protocol	AB3418
Limit Access	0
Baud	1200
Parity	NONE
Data Bits	8
Stop Bits	1
RTS On Time	20
RTS Off Time	20
Handshaking	NORMAL

C21 (6-1-3)	
Address	
Protocol	AB3418
Limit Access	0
Baud	1200
Parity	NONE
Data Bits	8
Stop Bits	1
RTS On Time	20
RTS Off Time	20
Handshaking	NORMAL

Limit Access:

0-None

1-Status Only

2-Status, Set Pattern, Time

3-Status, Set Pattern, Time, Manual Plan

SOFT LOGIC

Soft Logic (6-2)

#	Data	OP	Data	OP	Data	OP	Data
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							

*Refer to User's Manual for Data and OP Codes

CALLBACK NUMBERS

Callback Numbers (6-3...3)

Line Out	
Local Toll	
Long Distance	
Delay	10
Area Code	
Phone Number	

Line Out	
Local Toll	
Long Distance	
Delay	10
Area Code	
Phone Number	

Line Out	
Local Toll	
Long Distance	
Delay	10
Area Code	
Phone Number	

NETWORK

Network (6-4)

Address	1
Protocol	AB3418
Port	27000
IP Mode	STATIC

IP Address	172	.	22	.	8	.	97
Netmask	255	.	255	.	255	.	0
Broadcast	0	.	0	.	0	.	254
Gateway	172	.	22	.	8	.	1

RAILROAD PREEMPTION

RR 1

(3-1-1)	Timing	Phase Flags (3-1-2)			Pedestrian Flags (3-1-3)			Overlap Flags (3-1-4)		
		Grn Hold	Yel Flash	Red Flash	Walk	Flash DW	Solid DW	Grn Hold	Yel Flash	Red Flash
Delay										
Clear 1	10	.2..5...	.....	.....	.....	.....	.2.4.6.8	.....	.....	.....
Clear 2		.....	.....	.....	.....	.....	.....	.....	.....	.....
Clear 3		.....	.....	.....	.....	.....	.....	.....	.....	.....
Hold		.....	.....	12345678	.....	.....	.....	.....	.....	ABCDEF
Exit										
Min Grn										
Ped Clr										

Exit Parameters (3-1-5)

Phase Green	Overlap Green	Vehicle Call	Ped Call
.....	.....	12345678	.2.4.6.8

Configuration (3-1-6)

Port	Gate Port	Latching	Power-Up
2.5	0.0	YES	FLASHING

RR 2

(3-2-1)	Timing	Phase Flags (3-2-2)			Pedestrian Flags (3-2-3)			Overlap Flags (3-2-4)		
		Grn Hold	Yel Flash	Red Flash	Walk	Flash DW	Solid DW	Grn Hold	Yel Flash	Red Flash
Delay										
Clear 1	10	...4..7.	.....	.....	.....	.....	.2.4.6.8	.....	.....	.....
Clear 2		.....	.....	.....	.....	.....	.....	.....	.....	.....
Clear 3		.....	.....	.....	.....	.....	.....	.....	.....	.....
Hold		123..6..	.....	.....	.2...6..	.....	...4...8	.....	.....	.....
Exit										
Min Grn										
Ped Clr										

Exit Parameters (3-2-5)

Phase Green	Overlap Green	Vehicle Call	Ped Call
.....	.....	...4..7.	.....

Configuration (3-2-6)

Port	Gate Port	Latching	Power-up
2.6	0.0	YES	DARK

EMERGENCY VEHICLE PREEMPTION

EVA (3-A)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	5	35	.2..5...	.....

Port	Latching	Phase Termination
5.5	NO	ADVANCE

EVB (3-B)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	5	35	...4..7.	.....

Port	Latching	Phase Termination
5.6	NO	ADVANCE

EVC (3-C)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	5	35	1....6..	.....

Port	Latching	Phase Termination
5.7	NO	ADVANCE

EVD (3-D)

Preempt Timers			Phase Green	Overlap Green
Delay	Clear	Max		
	5	35	..3....8	.....

Port	Latching	Phase Termination
5.8	NO	ADVANCE

INPUTS

		7 Wire I/C (2-1-5-1)			
		Input	Port	Input	Port
Enable	NO	R1	3.8	Free	3.6
Max ON		R2	3.5	D2	2.8
Max OFF		R3	3.7	D3	6.1

Manual Control (2-1-5-2)	
Input	Port
Manual Advance	6.6
Advance Enable	6.6

Cabinet Status (2-1-5-3)	
Input	Port
Flash Bus	
Door Ajar	
Flash Sense	6.7
Stop Time	6.8

Special Function (2-1-5-4)	
Input	Port
1	
2	
3	
4	

Battery Backup (2-1-5-5)	
Port	Operation
2.7	FLASHING

Y-Coordination (2-1-5-6)	
Port C	Port D
6.1	2.8

OUTPUTS

Loadswitch Assignments (2-1-6)							+
A	1	2	22	3	4	24	9
B	5	6	26	7	8	28	10
X	13	14	0	11	12	0	0

Loadswitch Codes:

0 Unused (no output)
1-8 Vehicle 1-8
9-14 Overlap A-F
21-28 Ped 1-8
41-47 Special Functions
41 Protected Permissive Flashing Phase 1
43 Protected Permissive Flashing Phase 3
45 Protected Permissive Flashing Phase 5
47 Protected Permissive Flashing Phase 7
51-57 Special Functions
71-72 Seven Wire I/C

\+ middle output of loadswitches 3 and 6
Channel 9 and 10

TRANSIT PRIORITY

Local Plans (3-E) 1...9 11...19		Early Green	Green Extend	Inhibit Cycles	Phase 1 Minimum	Phase 2 Minimum	Phase 3 Minimum	Phase 4 Minimum	Phase 5 Minimum	Phase 6 Minimum	Phase 7 Minimum	Phase 8 Minimum
Plan 1	Green Factor											
Plan 2	Green Factor											
Plan 3	Green Factor											
Plan 4	Green Factor											
Plan 5	Green Factor											
Plan 6	Green Factor											
Plan 7	Green Factor											
Plan 8	Green Factor											
Plan 9	Green Factor											
Plan 11	Green Factor											
Plan 12	Green Factor											
Plan 13	Green Factor											
Plan 14	Green Factor											
Plan 15	Green Factor											
Plan 16	Green Factor											
Plan 17	Green Factor											
Plan 18	Green Factor											
Plan 19	Green Factor											

Transit Priority Configuration (3-E-A)				Indicator Output	
Enable in Plans		Input	Type	Stop	Go
Plan 1-9	.....	0.0	OPT	0	0
Plan 11-19	.....	0.0	OPT	0	0

Queue Jump (3-E-B)	
Grn Hold	Hold Phase
	.....
	.....

Free Plans (3-E-E)	
Max Grn Hold	Hold Phase
	.....

Access Utilities (9-5)	
Password	***
Timeout	30

YELLOW YIELD COORDINATION

					Force-Offs											
Y-Coord Plans (7-C,D)	Long Grn	No Grn	Offset	Perm	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	Coord	Lag	Min Recall	Restricted
Plan C													.2...6..	.2.4.6.8	.....	.....
Plan D	75	140	13					60					.2...6..	.2.4.6.8	.....	.....

TRUCK PRIORITY

Truck Priority (3-F)	Passage	CarryOver	Clearance	Next Priority	Phase Green	Det 2 Port	Det 3 Port	Det 4 Port	Sign Output	Slave Input	Slave Output
					.....	0.0	0.0	0.0	0	0.0	0

Appendix C

Crash Summary

Accident report statistics, taken at red light camera intersections (El Camino/Millbrae Ave., Millbrae Ave/Rollins Rd., s/b Hwy 101/E Millbrae Ave).

Year	# Accidents	
2000	47	
2001	55	
2002	48	
2003	43	
2004	25	
2005	32	
2006	23	
2007	24	
2008	23	
2009	22	
2010	29	
2011	30	
2012	24	
2013	17	
2014	18	
2015	8	(1/1/2015 thru 6/30/2015)

Appendix D

Traffic Counts

Volume Count Report
Generated by MSC3(Version 2.01 Copyright 1990-1! Mitron Systems Corporation

Location Millbrae Avenue El Camino Real to Rollins Road
Location Code 74
County .....SAN MATEO CO.
Recorder Set 4/15/1999 11:58
Recording Start ... 4/15/1999 12:00
Recording End 4/23/1999 11:15
Sample Time ..... 15 Minutes
Operator Numbe... 22
Machine Numbe.... 2
Channel 1
Divide By 2
Summation ..... No
Two-Way .....No

Thursday 04/15/1999 channel 1 Direction: Eastbound

1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	100	200	300	400	500	600	700	800	900	1000	1100	1200	Totals
2681	2620	2280	2274	2111	2147	1787	1547	1403	1307	803	510	231	128	76	113	252	753	1634	2652	2569	2014	1871	2132	35895
577	680	588	555	517	559	454	380	331	339	227	179	75	29	17	22	48	141	287	581	811	478	493	499	
676	633	565	596	532	559	456	409	353	358	211	151	75	40	18	27	49	175	430	625	684	548	457	488	
731	637	530	554	492	537	445	365	355	314	175	81	49	33	21	26	64	187	440	723	537	531	423	546	
697	670	597	569	570	492	432	393	384	296	190	99	32	26	20	38	91	250	477	743	537	457	498	599	

AM Peak Hour ..... 7:30 to 8:30 (2961 vehicles)
AM Peak Hour Factor 91.30%
PM Peak Hour ..... 12:15 to 13:15 (2784 vehicles)
PM Peak Hour Factor 95.20%

Friday 04/16/1999 channel 1 Direction: Eastbound

1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	100	200	300	400	500	600	700	800	900	1000	1100	1200	Totals
2659	2548	2371	2252	1915	1900	1778	1515	1361	1319	976	673	463	291	142	142	187	369	669	1059	1437	1656	1843	1924	31449
619	644	595	605	465	498	476	394	330	332	331	174	152	58	47	41	26	79	140	249	303	446	422	446	
705	643	593	609	490	461	423	369	329	303	238	195	143	45	47	31	54	82	152	274	332	418	441	509	
681	659	589	518	434	460	447	364	365	353	222	179	82	87	27	31	63	129	170	265	346	388	518	477	
654	602	594	520	526	481	432	388	337	331	185	125	86	101	21	39	44	79	207	271	456	404	462	492	

AM Peak Hour ..... 10:30 to 11:30 (1935 vehicles)
AM Peak Hour Factor 93.40%
PM Peak Hour ..... 12:15 to 13:15 (2684 vehicles)
PM Peak Hour Factor 95.20%

Saturday 04/17/1999 channel 1 Direction: Eastbound

1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	100	200	300	400	500	600	700	800	900	1000	1100	1200	Totals
2176	2172	1841	1720	1618	1614	1516	1270	1252	1211	919	635	300	190	159	117	142	258	473	699	1015	1277	1581	1762	25917
535	546	427	440	438	370	364	316	323	295	273	192	100	60	62	34	25	60	102	149	205	263	351	389	
562	548	496	442	365	421	359	307	296	347	248	180	68	46	38	24	47	66	107	166	261	322	359	490	
531	532	435	408	376	403	408	287	333	303	208	143	63	43	29	40	36	65	138	181	247	348	414	420	
548	546	483	430	439	420	385	360	300	266	190	120	69	41	30	19	34	67	126	203	302	344	457	463	

AM Peak Hour ..... 11:00 to 12:00 (1762 vehicles)
AM Peak Hour Factor 89.90%
PM Peak Hour ..... 12:15 to 13:15 (2187 vehicles)
PM Peak Hour Factor 97.30%

Sunday 04/18/1999 channel 1 Direction: Eastbound

1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	100	200	300	400	500	600	700	800	900	1000	1100	1200	Totals
2250	2168	2156	1774	1508	1562	1498	1231	1295	1165	685	389	159	95	50	104	311	976	2055	3456	3267	2382	2287	1814	34637
579	542	584	425	383	436	406	309	305	303	212	114	64	16	17	12	46	184	345	699	988	586	545	484	
574	519	570	508	395	370	354	296	369	294	187	122	36	25	9	35	65	214	550	862	928	586	586	438	
542	584	566	422	372	419	347	316	277	327	137	88	26	22	12	22	93	249	592	985	700	813	590	428	
555	523	436	419	358	337	391	310	344	241	149	65	33	32	12	35	107	329	568	910	651	597	566	464	

AM Peak Hour ..... 7:30 to 8:30 (3811 vehicles)
AM Peak Hour Factor 96.40%
PM Peak Hour ..... 13:30 to 14:30 (2261 vehicles)
PM Peak Hour Factor 96.80%

Monday 04/19/1999 channel 1 Direction: Eastbound

1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	100	200	300	400	500	600	700	800	900	1000	1100	1200	Totals
2053	2046	1877	1749	1458	1426	1266	930	989	767	433	285	130	62	63	87	206	631	1349	2272	2151	1571	1560	1576	26967
464	557	464	477	393	430	358	225	208	229	120	82	37	24	18	17	39	119	260	479	646	399	417	389	
489	481	463	431	351	327	329	248	249	188	119	99	35	16	15	19	45	149	339	571	554	389	422	376	
582	528	450	444	364	335	275	234	314	177	116	57	33	9	17	25	46	163	364	635	522	387	342	373	
518	480	500	397	380	334	304	223	218	173	78	47	25	13	13	26	76	200	386	587	429	396	379	438	

AM Peak Hour ..... 7:15 to 8:15 (2439 vehicles)
AM Peak Hour Factor 94.40%
PM Peak Hour ..... 12:15 to 13:15 (2146 vehicles)
PM Peak Hour Factor 92.20%

Tuesday 04/20/1999 channel 1 Direction: Eastbound

1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	100	200	300	400	500	600	700	800	900	1000	1100	1200	Totals
2045	1995	1837	1810	1593	1551	1268	1035	981	823	516	277	135	74	53	73	208	632	1365	2405	2315	1701	1551	1744	27987

469	526	450	511	377	383	340	265	245	229	154	86	36	16	16	13	29	112	264	497	652	497	379	390
536	511	438	453	377	407	310	253	247	231	132	101	37	18	11	19	45	140	356	589	625	441	404	463
534	473	477	437	433	402	298	270	226	193	109	61	23	19	7	15	58	170	336	662	554	410	380	443
506	485	472	409	406	359	320	247	263	170	121	29	39	21	19	26	76	210	409	657	484	353	388	448

AM Peak Hour ..... 7:30 to 8:30 (2596 vehicles)
AM Peak Hour Factor 98.00%
PM Peak Hour ..... 12:15 to 13:15 (2102 vehicles)
PM Peak Hour Factor 98.00%

Wednesday 04/21/1999 channel 1 Direction: Eastbound

1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	100	200	300	400	500	600	700	800	900	'000	1100	1200	Totals
2216	2048	1893	1807	1626	1683	1382	999	963	873	532	334	137	86	66	81	206	624	1387	2269	2167	:737	1699	1869	28684
522	542	485	450	366	450	370	258	260	226	179	118	45	24	16	23	37	125	243	480	634	437	441	441	
524	499	491	491	434	406	346	265	233	232	127	99	28	24	16	17	40	132	368	549	581	442	412	500	
557	523	452	411	379	412	351	215	230	200	120	55	38	20	17	16	50	158	349	652	498	423	425	477	
613	484	465	455	447	415	315	261	240	215	106	62	26	18	17	25	79	209	427	588	454	435	421	451	

AM Peak Hour ..... 7:30 to 8:30 (2455 vehicles)
AM Peak Hour Factor 94.10%
PM Peak Hour ..... 12:15 to 13:15 (2236 vehicles)
PM Peak Hour Factor 91.20%

Thursday 04/22/1999 channel 1 Direction: Eastbound

1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	100	200	300	400	500	600	700	800	900	1000	1100	1200	Totals
2310	2165	1894	1889	1706	1694	1400	1188	998	945	557	347	133	105	56	92	226	669	1355	2418	2508	1816	1773	474	28,718 nearest to average
524	638	478	500	383	457	375	306	278	237	190	129	35	25	15	20	31	108	240	493	750	503	452	474	
567	544	475	468	432	437	330	325	265	229	143	84	41	29	18	31	51	146	350	563	656	443	457		
616	491	457	465	420	422	374	279	242	262	124	69	27	33	9	14	57	180	351	695	572	430	397		
603	492	484	456	471	378	321	278	213	217	100	65	30	18	14	27	87	235	414	667	530	440	467		

AM Peak Hour ..... 7:30 to 8:30 (2768 vehicles)
AM Peak Hour Factor 92.30%
PM Peak Hour ..... 12:15 to 13:15 (2424 vehicles)
PM Peak Hour Factor 95.00%

daily average 30,032

Volume Generated	Count by	Report MSC3000	Version		2.01	Copyright	1990-1992	Mitron	Systems	Corporation																					
Location	...	MILLBRAE	AVE		ECR	TO		ROLLINS				WESTBOUND																			
Location	Code	....		86																											
County	....	SAN	MATEO		CO.																										
Recorder	Set	...		4/15/1999		11:58																									
Recording	Start	...		4/15/1999		12:00																									
Recording	End	.....		4/23/1999		11:15																									
Sample	Time	.....		15	Minutes																										
Operator	Number	...		22																											
Machine	Number	..		1																											
Channel	.....		1																												
Divide	By	....		2																											
Summation	.....	No																													
Two-Way	.....	No																													

Thursday 4/15/1999 Channel: 1 Direction: W

1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	100	200	300	400	500	600	700	800	900	1000	1100	1200	Totals
2126	1717	2000	1212	3076	3020	1817	1407	1028	931	752	372	184	95	62	68	105	224	591	978	1204	1258	1354	2397	27958
570	418	493	539	738	750	547	394	281	254	212	133	56	24	14	19	19	39	93	180	302	294	325	431	
546	394	473	283	788	810	407	345	260	228	183	81	35	30	18	17	18	44	149	256	280	308	345	525	
510	394	541	11	722	786	468	354	255	229	195	81	40	25	13	18	33	71	170	274	329	308	331	694	
500	511	493	379	828	674	395	314	232	220	162	77	33	16	17	14	35	70	178	268	293	348	353	757	

AM Peak Hour .. 11:00 to 12:00 (2397 vehicles)
AM Peak Hour Factor 79.20%
PM Peak Hour ..... 16:45 to 17:45 (3174 vehicles)
PM Peak Hour Factor 95.80%

Friday 4/16/1999 Channel: 1 Direction: W

1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	100	200	300	400	500	600	700	800	900	1000	1100	1200	Totals
2538	2055	2645	2806	2883	2826	2006	1385	998	960	857	607	346	218	180	123	115	160	411	575	862	1206	1818	1992	30372
733	462	583	767	725	769	580	385	260	277	207	187	118	54	56	50	29	39	51	115	174	265	370	446	
648	517	611	698	679	718	532	403	263	252	203	154	82	50	57	28	32	39	76	135	200	280	378	472	
612	516	745	678	723	659	500	315	248	231	245	139	87	55	43	21	23	39	138	166	244	336	429	502	
545	560	706	663	756	680	394	292	227	192	202	127	59	59	24	24	31	43	146	159	244	325	441	572	

AM Peak Hour ..... 11:00 to 12:00 (1992 vehicles)
AM Peak Hour Factor 87.10%
PM Peak Hour ..... 16:30 to 17:30 (2966 vehicles)
PM Peak Hour Factor 96.40%

Saturday 4/17/1999 Channel: 1 Direction: W

1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	100	200	300	400	500	600	700	800	900	1000	1100	1200	Totals
2084	1810	1797	1828	1599	1459	1429	1074	868	737	691	531	274	187	111	76	65	120	249	315	506	845	1240	1492	21386
508	473	476	442	414	390	375	254	235	187	161	154	80	47	30	25	16	26	33	63	89	172	272	391	
539	461	454	477	404	399	378	299	215	158	198	153	77	61	35	17	15	30	55	70	130	189	306	332	
531	438	426	464	394	356	307	239	224	170	176	113	55	36	24	16	17	31	96	98	131	259	358	389	
506	438	441	445	387	314	368	282	194	222	158	111	62	43	22	18	17	33	64	84	156	225	304	380	

AM Peak Hour ..... 11:00 to 12:00 (1492 vehicles)
AM Peak Hour Factor 95.40%
PM Peak Hour ..... 12:00 to 13:00 (2084 vehicles)
PM Peak Hour Factor 96.70%

Sunday 4/18/1999 Channel: 1 Direction: W

1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	100	200	300	400	500	600	700	800	900	1000	1100	1200	Totals
1601	1591	1514	1243	1251	1221	1160	938	691	620	443	249	112	74	45	45	86	230	580	960	1165	1157	1249	1732	19957
436	403	426	305	280	351	274	264	185	178	126	78	36	19	12	9	15	35	90	205	259	297	276	378	
370	350	338	331	325	272	307	239	186	155	107	65	32	23	9	11	16	57	134	253	254	269	289	414	
381	411	400	313	343	285	310	215	163	134	106	59	31	18	14	12	29	65	169	238	323	289	334	442	
414	427	350	294	297	313	269	220	157	153	104	47	13	14	10	13	26	73	187	264	299	303	350	498	

AM Peak Hour ..... 11:00 to 12:00 (1732 vehicles)
AM Peak Hour Factor 86.90%
PM Peak Hour ..... 13:15 to 14:15 (1614 vehicles)
PM Peak Hour Factor 94.50%

Monday 4/19/1999 Channel: 1 Direction: W

1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	100	200	300	400	500	600	700	800	900	1000	1100	1200	Totals
2055	1781	1975	2095	2301	2240	1710	1156	857	762	562	285	156	89	77	54	113	286	642	1058	1290	1258	1321	1843	25966 channel to average
513	495	442	503	520	642	455	324	234	226	164	95	54	29	24	15	20	46	104	209	323	333	331	384	
498	470	508	603	509	550	463	291	246	216	134	73	46	25	21	11	29	81	158	231	323	276	303	419	
520	433	489	472	605	542	453	273	193	159	143	65	29	12	19	14	30	77	178	320	326	308	329	505	
524	383	596	517	667	506	339	268	184	161	121	52	27	23	13	14	34	82	202	298	318	341	358	535	

AM Peak Hour ..... 11:00 to 12:00 (1843 vehicles)
AM Peak Hour Factor 86.10%
PM Peak Hour ..... 16:30 to 17:30 (2464 vehicles)
PM Peak Hour Factor 92.40%

Tuesday 4/20/1999 Channel: 1 Direction: W

1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	100	200	300	400	500	600	700	800	900	1000	1100	1200	Totals
1850	1704	2097	2058	1890	1935	1355	1005	769	569	459	243	125	67	43	42	86	215	572	922	1085	1134	1215	1694	23135
511	467	513	510	513	520	371	289	204	171	112	82	39	19	13	7	16	43	99	211	262	310	265	398	
456	406	519	538	422	505	368	271	188	134	122	61	28	17	9	12	22	41	126	211	241	261	285	406	
420	432	532	497	456	488	332	228	190	143	116	54	33	17	14	11	27	63	172	264	303	269	316	435	
463	399	533	513	499	422	284	217	187	121	109	46	25	14	7	12	21	68	175	236	280	292	345	455	

AM Peak Hour ..... 11:00 to 12:00 (1694 vehicles)
AM Peak Hour Factor 93.10%
PM Peak Hour ..... 14:30 to 15:30 (2113 vehicles)
PM Peak Hour Factor 98.20%

Wednesday 4/21/1999 Channel: 1 Direction: W

1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	100	200	300	400	500	600	700	800	900	1000	1100	1200	Totals
1685	1530	1772	1891	1996	1880	1565	1114	866	698	521	288	160	89	52	45	90	206	572	899	1128	1157	1333	1997	23634
460	354	392	427	455	520	459	306	252	203	133	92	48	24	21	13	13	38	92	180	275	296	323	416	
420	402	413	493	505	481	411	296	214	174	126	76	36	28	12	9	20	46	128	212	254	312	288	472	
405	371	487	507	492	505	355	257	208	170	139	66	42	12	6	9	28	54	179	274	293	263	384	493	
400	403	480	464	544	474	340	255	194	151	123	54	34	25	13	14	29	68	173	233	306	286	338	616	

AM Peak Hour .... 11:00 to 12:00 (1997 vehicles)
AM Peak Hour Factor 81.00%
PM Peak Hour .... 16:15 to 17:15 (2061 vehicles)
PM Peak Hour Factor 94.70%

Thursday 36272 Channel: 1 Direction: W

1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	100	200	300	400	500	600	700	800	900	1000	1100	1200	Totals
1991	1890	2313	2595	2519	2490	1829	1315	1039	836	676	387	208	134	98	80	114	307	716	1123	1303	1510	1601	1870	28944
527	534	519	641	610	658	556	372	254	229	191	126	50	32	33	23	20	55	127	243	332	380	354	485	
506	432	503	659	574	673	451	318	282	223	170	104	60	38	24	17	12	55	148	285	311	416	400	430	
509	447	615	657	626	632	427	313	252	194	169	79	50	34	17	20	43	87	212	309	310	354	428	455	
449	476	676	638	709	527	395	312	251	190	146	78	48	30	24	20	39	110	229	286	350	360	419	500	

AM Peak Hour . .. . 0.4270833 to 0.46875 (1732 vehicles)
AM Peak Hour Factor 0.893
PM Peak Hour .... 0.6979167 to 0.73958333 (2672 vehicles)
PM Peak Hour Factor 0.942

daily average 25189

Prepared by NDS/ATD

VOLUME

Millbrae Avenue between El Camino Real and Rollins Road

Day: Tuesday
Date: 3/22/2016

City: Millbrae
Project #: 16-7210-001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	19,083	23,591	42,674

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00	0	0	38		67		105		12:00	0	0	308		388		696	
00:15	0	0	42		60		102		12:15	0	0	301		382		683	
00:30	0	0	31		52		83		12:30	0	0	324		362		686	
00:45	0	0	32	143	62	241	94	384	12:45	0	0	318	1251	369	1501	687	2752
01:00	0	0	23		40		63		13:00	0	0	326		379		705	
01:15	0	0	28		46		74		13:15	0	0	310		366		676	
01:30	0	0	25		39		64		13:30	0	0	332		379		711	
01:45	0	0	25	101	33	158	58	259	13:45	0	0	359	1327	388	1512	747	2839
02:00	0	0	15		26		41		14:00	0	0	292		374		666	
02:15	0	0	23		30		53		14:15	0	0	318		366		684	
02:30	0	0	21		22		43		14:30	0	0	340		389		729	
02:45	0	0	14	73	23	101	37	174	14:45	0	0	319	1269	380	1509	699	2778
03:00	0	0	19		18		37		15:00	0	0	311		416		727	
03:15	0	0	11		15		26		15:15	0	0	341		384		725	
03:30	0	0	18		25		43		15:30	0	0	319		380		699	
03:45	0	0	20	68	31	89	51	157	15:45	0	0	325	1296	424	1604	749	2900
04:00	0	0	19		27		46		16:00	0	0	295		417		712	
04:15	0	0	24		36		60		16:15	0	0	285		458		743	
04:30	0	0	43		28		71		16:30	0	0	274		450		724	
04:45	0	0	48	134	46	137	94	271	16:45	0	0	312	1166	455	1780	767	2946
05:00	0	0	71		65		136		17:00	0	0	313		514		827	
05:15	0	0	84		73		157		17:15	0	0	303		473		776	
05:30	0	0	108		78		186		17:30	0	0	267		244		511	
05:45	0	0	110	373	98	314	208	687	17:45	0	0	262	1145	484	1715	746	2860
06:00	0	0	141		90		231		18:00	0	0	257		506		763	
06:15	0	0	151		124		275		18:15	0	0	227		476		703	
06:30	0	0	204		160		364		18:30	0	0	242		448		690	
06:45	0	0	242	738	205	579	447	1317	18:45	0	0	247	973	425	1855	672	2828
07:00	0	0	297		190		487		19:00	0	0	213		442		655	
07:15	0	0	321		202		523		19:15	0	0	206		363		569	
07:30	0	0	318		225		543		19:30	0	0	196		378		574	
07:45	0	0	375	1311	273	890	648	2201	19:45	0	0	175	790	312	1495	487	2285
08:00	0	0	367		247		614		20:00	0	0	225		333		558	
08:15	0	0	384		259		643		20:15	0	0	166		318		484	
08:30	0	0	365		247		612		20:30	0	0	175		265		440	
08:45	0	0	367	1483	352	1105	719	2588	20:45	0	0	144	710	256	1172	400	1882
09:00	0	0	322		288		610		21:00	0	0	165		256		421	
09:15	0	0	295		298		593		21:15	0	0	145		227		372	
09:30	0	0	271		275		546		21:30	0	0	168		211		379	
09:45	0	0	286	1174	272	1133	558	2307	21:45	0	0	144	622	220	914	364	1536
10:00	0	0	274		309		583		22:00	0	0	143		208		351	
10:15	0	0	242		284		526		22:15	0	0	141		178		319	
10:30	0	0	285		327		612		22:30	0	0	99		172		271	
10:45	0	0	281	1082	334	1254	615	2336	22:45	0	0	87	470	169	727	256	1197
11:00	0	0	273		326		599		23:00	0	0	76		110		186	
11:15	0	0	273		313		586		23:15	0	0	72		96		168	
11:30	0	0	278		365		643		23:30	0	0	80		101		181	
11:45	0	0	281	1105	395	1399	676	2504	23:45	0	0	51	279	100	407	151	686
TOTALS				7785		7400		15185	TOTALS				11298		16191		27489
SPLIT %				51.3%		48.7%		35.6%	SPLIT %				41.1%		58.9%		64.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	19,083	23,591	42,674

AM Peak Hour	07:45	11:30	11:45	PM Peak Hour	13:00	17:45	16:30
AM Pk Volume	1491	1530	2741	PM Pk Volume	1327	1914	3094
Pk Hr Factor	0.971	0.968	0.985	Pk Hr Factor	0.924	0.946	0.935
7 - 9 Volume	2794	1995	4789	4 - 6 Volume	2311	3495	5806
7 - 9 Peak Hour	07:45	08:00	08:00	4 - 6 Peak Hour	16:30	16:30	16:30
7 - 9 Pk Volume	1491	1105	2588	4 - 6 Pk Volume	1202	1892	3094
Pk Hr Factor	0.971	0.785	0.900	Pk Hr Factor	0.960	0.920	0.935

Appendix E

Citation Summary

Location Performance Summary
SB El Camino Real
SB 101 to Millbrae Ave

	Violation ivents	Citations issued
SB El Camino Real		
2009	646	317
2010	3,692	1,976
2011	2,989	1,743
2012	1,249	817
2013	1,935	1,377
2014	2,408	1,700
2015	2,847	1,710
	15,766	**9,640**
SB 101 to Millbtae Ave		
2009	1,921	1,006
2010	4,851	2,769
2011	6,969	2,368
2012	7,554	2,179
2013	4,860	1,121
2014	7,400	3,891
2015	7,885	4,418
	41,440	**17,752**

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

ENCROACHMENT PERMIT

TR-0120 (REV 6/2012)

Permit No.	
0416-NUM0923	
Dist/Co/Rte/PM	
04-SM-82 PM Var	
DATE	
May 6, 2016	
Fee Paid	Deposit
$ 492.00	$
Performance Bond Amount	Payment Bond Amount
$	$
Bond Company	
Bond Number (1)	Bond Number (2)

In compliance with (Check one):

☒ Your application of April 25, 2016

☐ Utility Notice No. _____ of _____

☐ Agreement No. _____ of _____

☐ R/W Contract No. _____ of _____

TO: City of Millbrae
621 Magnolia Avenue
Millbrae, CA 94030

Attn: Khee Lim
Phone: (650) 259-2339

, **PERMITTEE**

And subject to the following, **PERMISSION IS HEREBY GRANTED** to:

Perform routine and emergency maintenance work on permittee's facilities located on conventional State Highways 04-SM-82, at various post miles, in the County of San Mateo.

Any work involving bona-fide emergency repairs on permittee's facilities shall be initiated with Caltrans District 04 Communications Center at (510) 286-6359 to obtain appropriate lane closure or work authorization number. Emergencies are defined as those conditions that require immediate action to prevent property damage, loss of service, or life-safety risks.

All permitted work requires the permittee to apply for and obtain a work authorization number prior to start of work. See the attached "Encroachment Permit Project Work Scheduling Procedures" and the attached "Permit Project Work Scheduling Request Form". Additional time beyond the minimum seven-day advanced notice required in the above paragraph may be required for obtaining approval.

THIS PERMIT IS NOT A PROPERTY RIGHT AND DOES NOT TRANSFER WITH THE PROPERTY TO A NEW OWNER.

The following attachments are also included as part of this permit (*Check applicable*):

☐ Yes	☒ No	General Provisions (TR-0045)
☒ Yes	☐ No	Utility & Tree Trimming Provisions (03/2013)
☒ Yes	☐ No	Storm Water Special Provisions (TR-0400)
☐ Yes	☒ No	A Cal-OSHA permit, if required: Permit No. _____
☐ Yes	☒ No	As-Built Plans Submittal Route Slip for Locally Advertised Projects
☐ Yes	☒ No	Storm Water Pollution Prevention Plan

In addition to fee, the permittee will be billed actual costs for:

☐ Yes	☒ No	Review
☒ Yes	☐ No	Inspection
☒ Yes	---------	Field Work

(If any Caltrans effort expended)

☐ Yes ☒ No The information in the environmental documentation has been reviewed and considered prior to approval of this permit.

This permit is void unless the work is completed before December 31, 2016.

This permit is to be strictly construed and no other work other than specifically mentioned is hereby authorized.
No project work shall be commenced until all other necessary permits and environmental clearances have been obtained.

ML/ml

c: Glee,
ESherman III (2)

APPROVED:

BIJAN SARTIPI, District Director, District 4

BY:

DAVID SALLADAY, District Permit Engineer

ADA Notice For individuals with sensory disabilities, this document is available in alternate formats. For information call (916) 654-6410 or TDD (916) 654-3880 or write Records and Forms Management, 1120 N Street, MS-89, Sacramento, CA 95814.

A minimum of one week prior to the start of work under this permit, notice shall be given and advance approval of construction detail, operations, public safety and traffic control shall be obtained from the following State Representative:

In Southern San Mateo County, George Lee, 380 Foster City Blvd., Foster City, CA 94404, at (650) 573-8669, or at @dot.ca.gov, weekdays between 7:30am and 4:15pm.

When approved, traffic control under this permit must comply with Caltrans Standard Plans RSP T9 through RSP T14 (available at http://www.dot.ca.gov/hq/esc/oe/construction_standards.html).

All work shall comply with the attached "Encroachment Permit General Provisions" (TR-0045, Rev. 05/2007) (available at http://www.dot.ca.gov/hq/traffops/developserv/permits/).

All the permittee's personnel must wear appropriate and approved personal protective equipment per Chapter 12 of Caltrans "Safety Manual" (available at http://www.dot.ca.gov/hq/opo/safety/safetymanual/Chap_12-Sept2012.pdf), including hard hats and bright-colored safety vests, shirts or jackets with retro-reflective material, while on the State right-of-way.

The job site must be enclosed by suitable barricades, signs, and lights to warn and protect traffic effectively, as approved by the State Representative.

No lane closure is allowed on the highway without pre-approval from the District Traffic Manager. Shoulder may be closed between 9:00 AM and 3:00 PM, Monday through Friday, except holidays, as authorized by the State Representative, or otherwise approved by the District Traffic Manager.

No work on freeways/expressways or their ramps, including traffic control, is allowed under this permit.

Streets and highways in the Bay Area contain a significant number of existing underground utilities. This includes traffic signal conduits that are installed 9 inches or less in depth. Permittee is responsible for necessary site investigations for identification of the location and depth of existing underground facilities prior to excavation (e.g. pothole or hand-dig) to avoid damage or disruption in services.

The permittee must be responsible for all compliance with the Caltrans Storm Water Program and NPDES permit requirements.

Any change or damage to any existing facilities, landscaping, irrigation or drainage pattern, whether occasioned by increase or diversion, and the cost of any damage, repairs or restoration within the State right-of-way must be the responsibility of the permittee.

In accordance with subdivision (a) of Streets and Highways Code section 682.5, Caltrans shall not be responsible for the conduct or operation of the permitted activity, and permittee agrees to indemnify and hold harmless the State and the City or the County against any and all claims arising out of any activity for which the permit is issued.

If an accident or other incident (related to or not related to the permitted activity) occurs within, or close to the permitted activity, the Permittee shall immediately stop work and remove traffic controls from the highway unless public health, welfare and safety is endangered by unfinished work. Only traffic control to protect open excavations may remain in place. After free traffic flow is restored, work in accordance with the conditions of the permit may be resumed.

Trench backfill must comply with the most current Caltrans Standard Specifications and Standard Plans (both available at http://www.dot.ca.gov/hq/esc/oe/construction_standards.html). Tests for relative compaction of structure backfill material used in backfilling trenches can use California Test Method 231, "Method of Test for Relative Compaction of Untreated and Treated Soils and Aggregates Using Nuclear Gage" (available at http://www.dot.ca.gov/hq/esc/ctms/pdf/CT_231_Mar2013.pdf). Any base, surfacing, or pavement must be replaced in kind, or as otherwise approved by the State Representative.

Pavement to be removed must be saw cut to a minimum depth of 4 inches to provide a neat and straight pavement break along both sides of trench. Asphalt Concrete (AC) pavement must be saw cut to the full depth.

No excavation must be left open overnight or unless otherwise authorized by the State Representative. After backfilling the trench, temporary surfacing must be placed if required by the State Representative.

Where the edge of trench is within 2 feet of existing curb, gutter, or pavement edge, Asphalt Concrete (AC) pavement between the trench and curb, gutter, or pavement edge must be removed, or as otherwise authorized by the State Representative.

Immediately following completion of the work permitted herein, the permittee shall fill out and mail the Notice of Completion attached to this permit.

DEPARTMENT OF TRANSPORTATION
111 GRAND AVENUE
P.O. BOX 23660
OAKLAND, CA 94623-0660
PHONE (510) 286-5900
FAX (510) 286-5903
TTY 711
www.dot.ca.gov

Serious Drought.
Serious drought.
Help save water!

July 7, 2016

04-SM-101
PM 17.9
0416-NSN1019

Khee Lim
City of Milbrae
621 Magnolia Avenue
Millbrae, CA 94030

Dear Mrs Lim:

This letter is regarding your encroachment permit application dated May 4, 2016 to comply with the Traffic Operations Policy Directive 14-01 Revision 1 for ARLES at the El Camino Real and Millbrae Avenue intersection, on State Highway 04-SM-101, Post Mile 17.9, in the City of Millbrae.

The following comments must be satisfactorily addressed before a permit can be issued:

Traffic (Safety)

1. Provide a table that summarizes the total number of violation events versus the number of citations issued. The table provided in the traffic engineering study submitted with the application provides only the number of citations issued each year.
2. In Appendix C of the traffic study, provide a breakdown of the crash number by each intersection and the type of crash.
3. In Appendix E of the traffic study, replace the word "ivent" to "event" on the second page.

Please respond to all review comments, and revise the plans and specifications as necessary. Submit six (6) sets of revised plans (11" x 17") and six (6) sets of specifications for our review. Please direct all questions and inquiries regarding your application status to Markus Lansdowne at (510) 286-4419 or email at markus.lansdowne@dot.ca.gov. Reference permit number 0416-NSN1019 with all correspondence.

If no response is received within forty five (45) days from the date of this letter, your encroachment permit application may be cancelled.

Sincerely,

AMJAD NASEER, PE
Senior Permit Engineer

DEPARTMENT OF TRANSPORTATION
111 GRAND AVENUE
P.O. BOX 23660
OAKLAND, CA 94623-0660
PHONE (510) 286-5900
FAX (510) 286-5903
TTY 711
www.dot.ca.gov

Serious Drought.
Serious drought.
Help save water!

July 7, 2016

04-SM-82
PM 15.9
0416-NSN1018

Khee Lim
City of Milbrae
621 Magnolia Avenue
Millbrae, CA 94030

Dear Mrs Lim:

This letter is regarding your encroachment permit application dated May 4, 2016 to comply with the Traffic Operations Policy Directive 14-01 Revision 1 for ARLES at the El Camino Real and Millbrae Avenue intersection, on State Highway 04-SM-82, Post Mile 15.9, in the City of Millbrae.

The following comments must be satisfactorily addressed before a permit can be issued:

Traffic (Safety)

1. Provide a table that summarizes the total number of violation events versus the number of citations issued. The table provided in the traffic engineering study submitted with the application provides only the number of citations issued each year.
2. In Appendix C of the traffic study, provide a breakdown of the crash number by each intersection and the type of crash.
3. In Appendix E of the traffic study, replace the word "ivent" to "event" on the second page.

Please respond to all review comments, and revise the plans and specifications as necessary. Submit six (6) sets of revised plans (11" x 17") and six (6) sets of specifications for our review. Please direct all questions and inquiries regarding your application status to Markus Lansdowne at (510) 286-4419 or email at markus.lansdowne@dot.ca.gov. Reference permit number 0416-NSN1018 with all correspondence.

If no response is received within forty five (45) days from the date of this letter, your encroachment permit application may be cancelled.

Sincerely,

AMJAD NASEER, PE
Senior Permit Engineer