



February 12, 2016

Ms. Kathy Oesterreich
Edenbridge Homes
21771 Stevens Creek Boulevard, Suite 200A
Cupertino, CA 95014-1175

RE: Copperleaf Subdivision, San Juan Bautista California

Dear Ms. Oesterreich:

Hatch Mott MacDonald (HMM) is pleased to provide traffic engineering services for development of a 45-unit subdivision on San Juan – Hollister Highway, east of The Alameda, in San Juan Bautista, California. **Exhibit 1** depicts the location of the subdivision, while **Exhibit 2** depicts the site plan.

A. Existing Conditions

The following study intersections were reviewed in this study:

1. The Alameda / State Route 156 (SR 156); and
2. Mission Vineyard Road – Breen Road / SR 156.

Exhibit 3 shows the traffic volumes at the study intersections.

Traffic volumes at The Alameda / SR 156 are taken from the report “San Juan Bautista Gas Station and Restaurant, San Juan Bautista, California,” Hatch Mott MacDonald, December 30, 2013. New traffic counts at the Mission Vineyard Road – Breen Road / SR 156 intersection were collected on April 30, 2015. The traffic counts for both intersections were conducted during the AM and PM peak periods (7:00 am to 9:00 am and 4:00 pm to 6:00 pm) and included cars, trucks, buses, pedestrians and bicycles. From these counts, the peak one-hour AM and PM periods were identified.

In a July 2014 update to the aforementioned December 2013 report, a seasonal adjustment of 1.20 (a.k.a. a 20% increase) was applied to the Existing condition volumes at The Alameda / State Route 156 intersection, in order to approximate peak summer month traffic within the study area. That adjustment was also used in this analysis, and was carried through to the traffic volumes at the Mission Vineyard Road – Breen Road / State Route 156 intersection through adjustment of through traffic between the study intersections. **Exhibit 3** depicts the Existing volumes (with the seasonal adjustment) that are used in this analysis. **Appendix A**, repeated from the earlier report, includes the derivation of the seasonal adjustment factor, which is based upon variations in Caltrans quarterly traffic volumes along the SR 156 corridor over an entire year.

Exhibit 4 summarizes the levels of service of the study intersections. The Alameda / SR 156 intersection operates at LOS C during both the AM and PM peak hours, which is better than the Caltrans level of service standard of the transition from LOS C to LOS D. The Mission Vineyard – Breen / SR 156 intersection operates at an acceptable overall LOS A under both peak hours, but the highest side-street delay (southbound Breen Road approach) is an unacceptable LOS F. **Appendix B** contains the level of service calculations, which utilize the Highway Capacity Manual 2010 methodologies.

B. Existing Plus Project Conditions

The project is a 45-unit residential subdivision. In addition, approximately 20% of the residences will also have an accessory dwelling unit; this equates to 9 additional accessory dwelling units on the study property. To be conservative, the trip generation estimate assumes both the 45 primary units and 9 accessory units will be constructed and occupied.

Exhibit 5 summarizes the project trip generation estimate. This trip generation estimate uses rates from *Trip Generation Manual*, 9th Edition, published by the Institute of Transportation Engineers in 2012.

The project would generate an estimated 479 daily trips, with 38 trips during the AM peak hour (10 in, 28 out) and 50 trips during the PM peak hour (31 in, 19 out).

Note: The analysis within this report is based on a prior site plan that included only 44 units, one less unit than currently proposed. As indicated within **Exhibit 5**, the current project definition (with 45 units) would generate one additional trip during each peak hour. This minimal increase in traffic would represent a negligible effect on the operations of the study intersections and would not change the following conclusions about the operations of the study intersections or potential project impacts.

Project trip distribution represents the percentage of project traffic that would travel to and from the project site at a localized level. **Exhibit 6** graphically depicts the estimated project trip distribution. This distribution was developed based upon the relative locations of compatible land uses and the relative magnitude of the existing traffic volumes within the study area.

Exhibit 6 also depicts the project trip assignment for the new project trips on the study network, using both the aforementioned trip generation and trip distribution to quantify the number of new project trips added to each direction of travel at each of the study intersections.

The trip assignment was added to the Existing volumes to create the Existing Plus Project volumes shown on **Exhibit 7**.

Exhibit 4 summarizes the levels of service of the study intersections under Existing Plus Project conditions. Levels of service at both study intersections remain the same as under Existing conditions. **Appendix B** contains the level of service calculations under Existing Plus Project conditions.

The City of San Juan Bautista does not have an established significance criteria. The following will be used to evaluate significant impacts to the surrounding street system (see next page):

Signalized Intersection: An impact would be significant if:

- The project would cause operations to deteriorate from acceptable conditions (i.e. LOS A, B or C) to unacceptable conditions (i.e. LOS D, E, or F); or
- If operations are already unacceptable (i.e. LOS D, E or F), the project would add 5.0 seconds of delay, compared to “without project” conditions.

Unsignalized Intersection: An impact would be significant if:

- The project would cause side-street operations to either deteriorate to unacceptable LOS F conditions or would add one peak hour trip to an intersection with side-street operations at unacceptable LOS F under “without project” conditions; and
- The intersection meets any volume- or delay-based traffic signal warrant.

Operations at The Alameda / SR 156 would continue to operate at an acceptable LOS C; therefore the project would not represent a significant impact at this intersection under Existing Plus Project conditions.

Side-street operations of the Mission Vineyard – Breen / SR 156 intersection would continue to operate at an unacceptable LOS F (specifically the southbound Breen Road approach). However, neither of the Caltrans peak hour signal warrants (volume or delay) is met under Existing Plus Project conditions. Therefore, the project would not represent a significant impact at this intersection under Existing Plus Project conditions.

C. Cumulative Conditions

Cumulative Conditions represent projected traffic operations in the Year 2035, or 20 to 22 years into the future. This scenario includes both traffic from the proposed project, (i.e. **Exhibit 6**), other pending projects in the area (such as the approved gas station and restaurant project on The Alameda at SR 156), and additional future traffic growth at The Alameda / SR 156 intersection. This additional future traffic growth is the same level of growth used in the December 2013 and July 2014 update of the aforementioned gas station and restaurant project, namely 2% per year (for 22 years) for mainline traffic on SR 156 and 0.5% per year (for 22 years) for all other movements at the intersection. The future traffic growth at The Alameda / SR 156 intersection was also extended to the mainline traffic on SR 156 at the adjacent Mission Vineyard – Breen / SR 156 intersection. Cumulative Condition traffic volumes are depicted within **Exhibit 8**.

Exhibit 4 summarizes the levels of service of the study intersections under Cumulative conditions. The Alameda / SR 156 intersection would continue to operate at LOS C during PM peak hour, but would operate at a deficient LOS D during the AM peak hour. The Mission Vineyard – Breen / SR 156 intersection operates at an acceptable overall LOS A (AM) and LOS B (PM), but the highest side-street delay (southbound Breen Road approach) remains an unacceptable LOS F. **Appendix B** contains the level of service calculations under Cumulative conditions.



As operations at The Alameda / SR 156 intersection during the AM peak hour worsen to an unacceptable LOS D under Cumulative conditions, the project would represent a significant impact at this intersection under Cumulative conditions. The previously recommended improvement at this intersection (i.e. for the aforementioned gas station and restaurant project) is the addition of an exclusive eastbound right turn lane. However, this improvement alone would not result in acceptable operations. It is also recommended that the project add a right turn overlap signal phase to the eastbound right turn movement. Both improvements together (i.e. the exclusive eastbound right turn lane and the eastbound right turn overlap signal phase) would result in acceptable operations at this intersection and lessen the project impact to a less-than-significant level. The project would be responsible for its fair-share contribution towards these improvements – 20% of the cost of both improvements – based upon the its percentage of the added traffic to the eastbound right turn movement at The Alameda / SR 156 intersection.

Side-street operations of the Mission Vineyard – Breen / SR 156 intersection would continue to operate at an unacceptable LOS F under Cumulative conditions (specifically the southbound Breen Road approach during the AM and PM peak hours and the northbound Mission Vineyard Road approach during the PM peak hour). However, neither of the Caltrans peak hour signal warrants (volume and delay) are met under Cumulative conditions. Therefore, the project would not represent a significant impact at this intersection under Cumulative conditions.

Note: **Appendix D** of this report contains updated Cumulative conditions volumes and an AM peak hour improvement level of service calculation with the revised project definition, i.e. 45 primary units and 9 accessory units. As previously indicated in Section B of this letter report, the updated improvement level of service calculations show no change in operations from those with the prior project definition. Therefore, the recommended improvements would continue to lessen the project impact to a less-than-significant level.

D. Site Access and Internal Circulation

There is little through traffic on San Juan – Hollister Highway, the roadway onto which the project has its vehicular access. The project also would generate a relatively low number of trips. Therefore, both of the project access points are anticipated to operate acceptably.

The proposed site plan is shown on **Exhibit 2**. Adequate access to all of the proposed parcels is provided from the proposed internal street system. All of the internal roadways are 56 feet wide, which provides sufficient room for a travel lane and parking aisle in both directions.

E. Impact Fees

The project would be responsible for payment of the San Benito County Transportation Impact Mitigation Fee. None of the identified mitigation improvements are funded by this fee.



F. Conclusion

In summary, the study project would generate an estimated 479 daily trips, with 38 trips during the AM peak hour and 50 trips during the PM peak hour.

The project would not impact the operations of the surrounding street network under Existing Plus Project conditions. However, the project would impact the surrounding street system under Cumulative conditions. The implementation of both an exclusive eastbound right turn lane and an eastbound right turn overlap signal phase at The Alameda / SR 156 intersection would result in acceptable operations at this intersection, and reduce the project's impact to a less-than-significant level. The project would be responsible for its fair-share contribution towards these improvements – 20% of the cost of both improvements.

Both of the project access points are anticipated to operate acceptably.

The proposed site plan provides access to all of the proposed parcels from the proposed internal street system. The internal roadways provide sufficient room for a travel lane and parking aisle in both directions.

The project would be responsible for payment of the San Benito County Transportation Impact Mitigation Fee. None of the identified mitigation improvements are funded by this fee.

If you have any questions regarding this analysis or need additional information, please do not hesitate to contact Jeff Waller at your convenience. Thank you for the opportunity to assist you with this project.

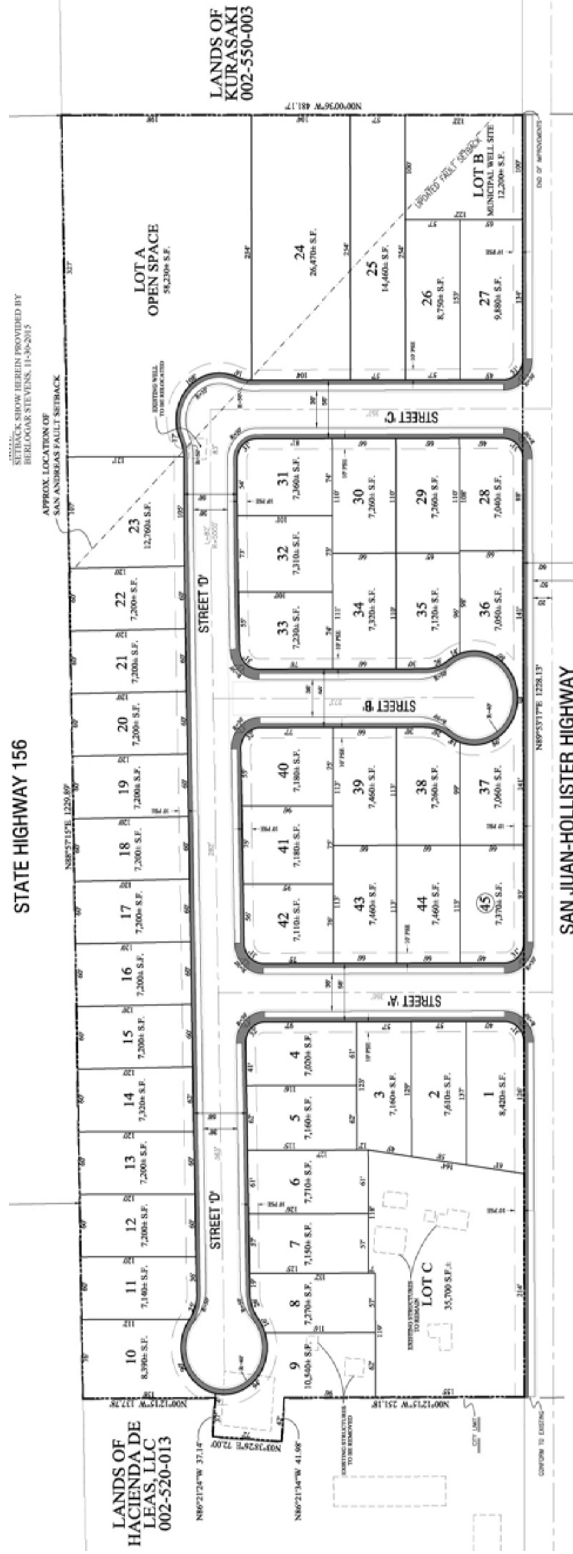
Respectfully submitted,

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kbh; jmw
enclosures



EXHIBIT 1 Project Location Map

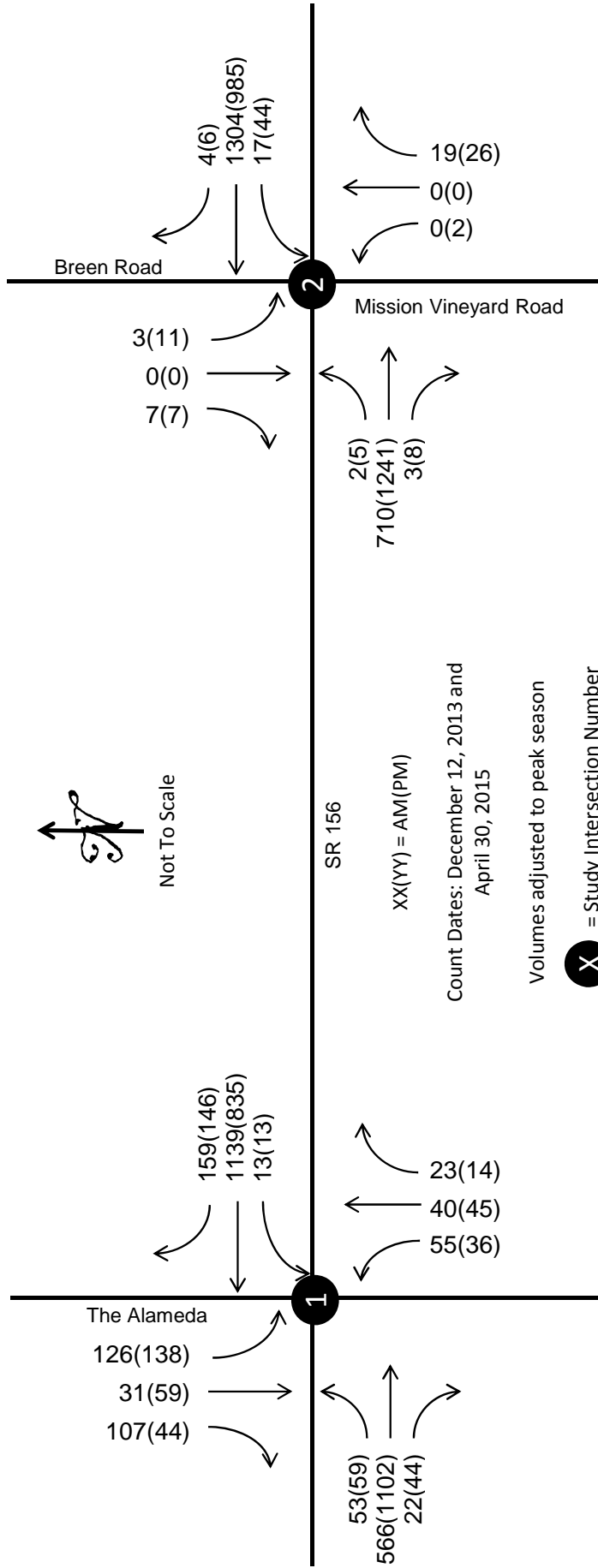


LANDS OF OTTOBONI
012-190-014

LANDS OF OTTOBONI
012-170-006

Source: Ruggeri-Jensen-Azar, December 22, 2015.

EXHIBIT 2 Project Site Plan



Not To Scale

SR 156

XX(YY) = AM(PM)

Count Dates: December 12, 2013 and April 30, 2015

Volumes adjusted to peak season

X = Study Intersection Number

| N-S Street | E-W Street | Existing Lane Configuration | Existing Intersection Control | LOS Standard | Existing Conditions | | | | Existing Plus Project Conditions | | | | Cumulative Conditions | | | |
|------------|------------------------------------|--|-----------------------------------|--------------|---------------------|--------|--------------|--------|----------------------------------|--------|--------------|--------|-----------------------|--------|-----------------|--------|
| | | | | | AM Peak Hr | | PM Peak Hr | | AM Peak Hr | | PM Peak Hr | | AM Peak Hr | | PM Peak Hr | |
| | | | | | Delay (sec) | LOS | Delay (sec) | LOS | Delay (sec) | LOS | Delay (sec) | LOS | Delay (sec) | LOS | Delay (sec) | LOS |
| 1 | The Alameda | NB 1-L/T, 1-R SB 1-L, 1-T/R EB 1-L, 1-T, 1-T/R WB 1-L, 2-T, 1-R | Signal <i>With Improvement</i> | C/D | 26.5 | C | 25.3 | C | 27.1 | C | 26.1 | C | 35.5 | D | 32.6 | C |
| 2 | Mission Vineyard Road - Breen Road | NB 1-L/T, 1-R* SB 1-L/T, 1-R* EB 1-L, 1-T/R WB 1-L, 1-T/R | One-Way Stop (Side Street) | C/D (E) | 0.5 69.2 | A F | 2.7 254.6 | A F | 0.6 71.3 | A F | 2.9 276.3 | A F | 0.8 159.6 | A F | 10.3 1,517.1 | B F |

NOTES:

1. L, T, R = Left, Through, Right.
2. NB, SB, EB, WB = Northbound, Southbound, Eastbound, Westbound.
3. * = Lane configuration reflect fact that this approach flares out at the intersection, allowing right turn movements side by side with through and left turn movements.
4. Analysis performed using 2010 Highway Capacity Manual methodologies.
5. Overall level of service standard for Caltrans is the threshold between LOS C and D.
6. Worst approach level of service standard is generally LOS E. Level of service "F" is the level of service at which improvements would be required.
7. Delay and level of service results reflect peak season operations (i.e. August).

EXHIBIT 4
Intersection
Levels of Service

| Trip Generation - Copperleaf Subdivision | | | | | | | | | | | |
|--|-------------------|-----------------|-----------------|----------|-----------|-----------|-----------------|----------|-----------|-----------|--|
| TRIP GENERATION RATES | ITE LAND USE CODE | DAILY TRIP RATE | AM PEAK HOUR | | | | PM PEAK HOUR | | | | |
| | | | PEAK HOUR RATE | % OF ADT | % IN | % OUT | PEAK HOUR RATE | % OF ADT | % IN | % OUT | |
| Single-Family Detached Housing (per unit) ¹ | 210 | 9.52 | 0.75 | 8% | 25% | 75% | 1.00 | 11% | 63% | 37% | |
| Accessory Dwelling Units (per unit) ² | - | 5.65 | 0.43 | 8% | 20% | 80% | 0.53 | 9% | 65% | 35% | |
| GENERATED TRIPS | PROJECT SIZE | DAILY TRIPS | AM PEAK HOUR | | | | PM PEAK HOUR | | | | |
| | | | PEAK HOUR TRIPS | % OF ADT | TRIPS IN | TRIPS OUT | PEAK HOUR TRIPS | % OF ADT | TRIPS IN | TRIPS OUT | |
| Proposed Uses | | | | | | | | | | | |
| Single-Family Detached Housing | 45 units | 428 | 34 | 8% | 9 | 25 | 45 | 11% | 28 | 17 | |
| Accessory Dwelling Units | 9 units | <u>51</u> | <u>4</u> | 8% | <u>1</u> | <u>3</u> | <u>5</u> | 10% | <u>3</u> | <u>2</u> | |
| Total Project Trip Generation: | | 479 | 38 | | 10 | 28 | 50 | | 31 | 19 | |
| Analyzed Project Trip Generation: ⁴ | | <u>470</u> | <u>37</u> | | <u>9</u> | <u>28</u> | <u>49</u> | | <u>31</u> | <u>18</u> | |
| Net Difference: | | 9 | 1 | | 1 | 0 | 1 | | 0 | 1 | |

Notes:

1. Trip generation rates from Institute of Transportation Engineers, *Trip Generation Manual*, 9th Edition, 2012, unless otherwise noted.
2. *Trip Generation Manual* does not provide trip rates for Accessory Dwelling Units (a.k.a. "Granny Units", or a secondary smaller housing unit on the same parcel as the primary house). It is assumed that Accessory Dwelling Units generate 85% of the Apartment (Land Use # 220) trip rates.
3. It is assumed that the number of Accessory Dwelling Units is equal to 20% of the maximum number of Single-Family Detached Housing proposed for the project site, or 9 units.
4. Trip generation analyzed within this study was for 44 single-family units and 9 accessory dwelling units, or one fewer single-family unit than identified on the current site plan. The difference in trip generation would have a negligible effect on traffic operations.

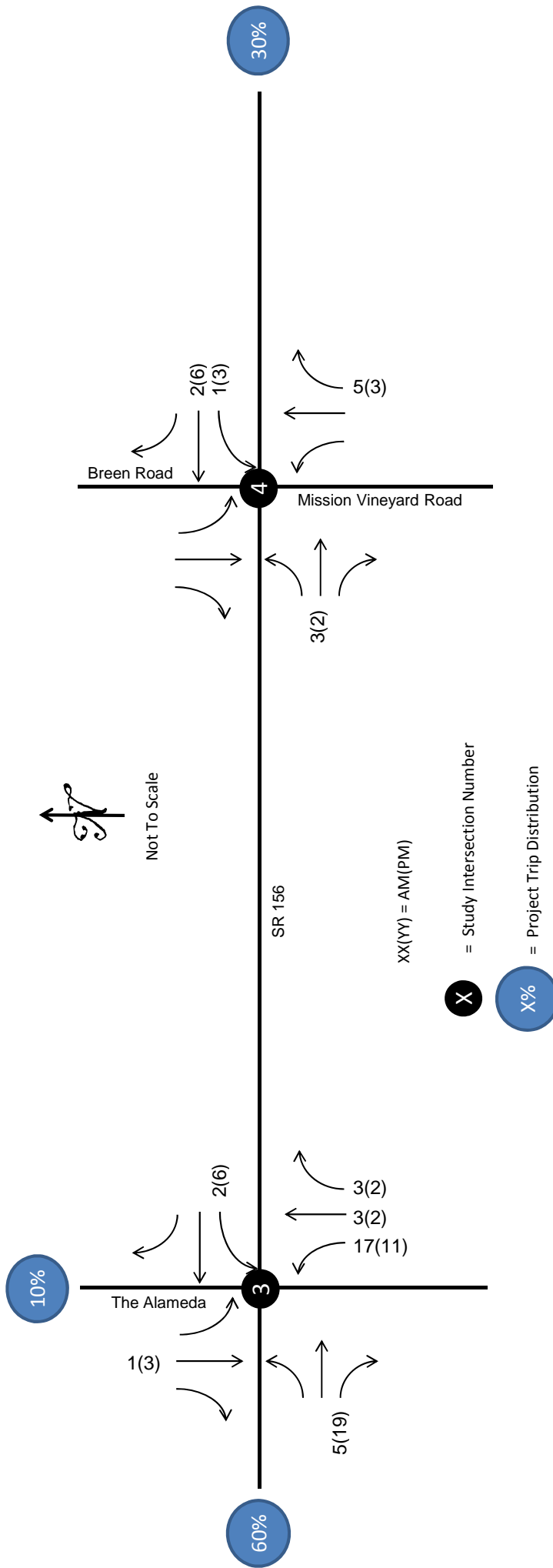


EXHIBIT 6
 Project Trip Distribution
 and Assignment
 AM and PM Peak Hour Volumes

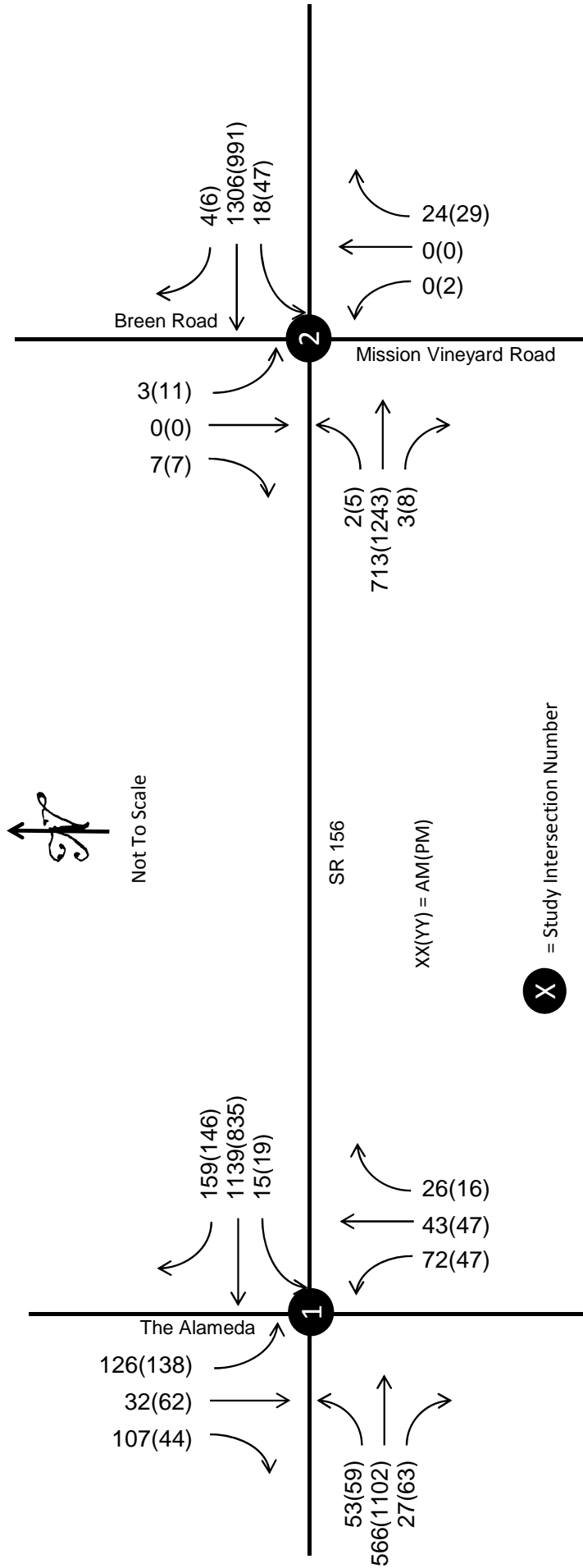


EXHIBIT 7
 Existing Plus Project Conditions
 AM and PM Peak Hour Volumes

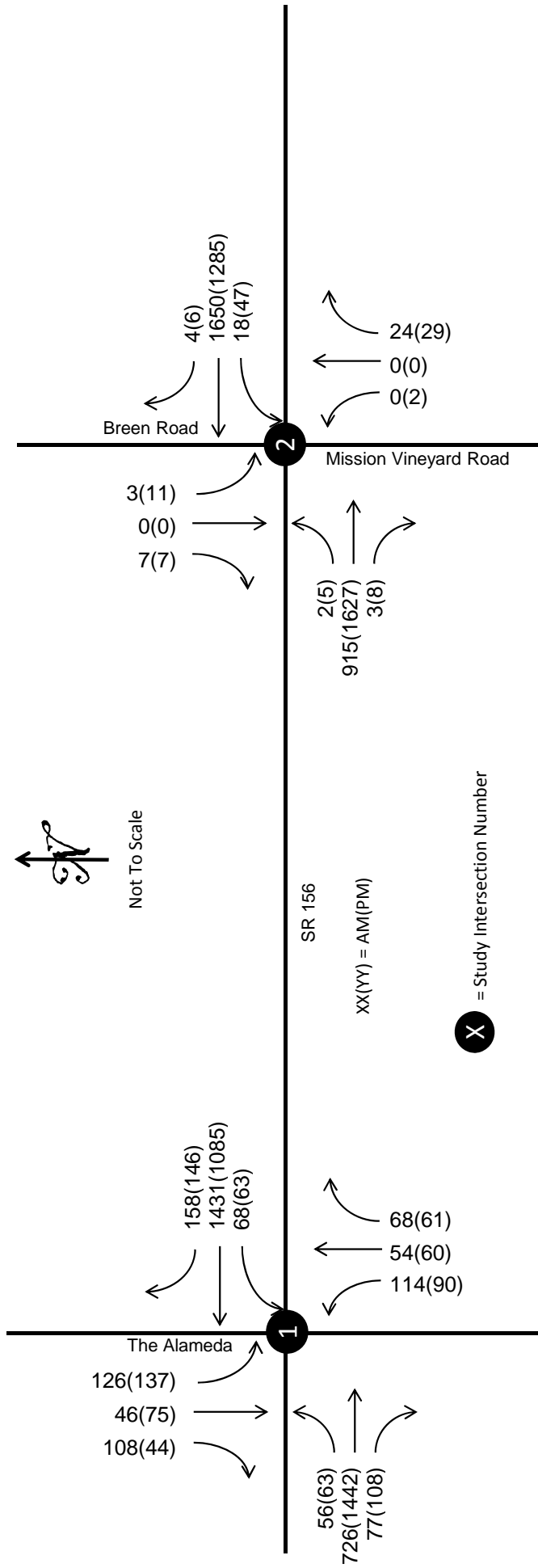


EXHIBIT 8
Cumulative Conditions
AM and PM Peak Hour Volumes



APPENDIX A

SEASONAL ADJUSTMENT
FACTOR

11:30:25

MONTHLY AVERAGE DAILY TRAFFIC L R AND I FACTORS

DISTRICT COUNTY ROUTE POSTMILE - LEG Traffic Station : 249
 05 SBT 156 000.000 - A Location Type : C
 Location Description Lanes : East 1 West 1
 Lane Code : 1

NORTH JCT. RTE. 101, SAN JUAN BAUTISTA

| FACTORS | | MONTHLY AVERAGE DAILY TRAFFIC | | | | | | | | | | | | | | |
|---------|---------|-------------------------------|-------|-----|--------|-------|-----|-------|-----|-----|-------|-----|-----|--------|-----|-------|
| DIR | DAY | L | R | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | AADT |
| E | SUN | 0.832 | 0.320 | | 5011 | | | 9900 | | | 9833 | | | 8350 | | 8274 |
| E | MON | 0.904 | 0.348 | | 4798 | | | 10687 | | | 10746 | | | 9717 | | 8987 |
| E | TUE | 1.000 | 0.219 | | 7533 | 7533 | | 11143 | | | 10920 | | | 10167 | | 9941 |
| E | WED | 1.026 | 0.179 | | 8200 | 8200 | | 11207 | | | 10986 | | | 10433 | | 10207 |
| E | THU | 1.045 | 0.185 | | 8282 | | | 11448 | | | 11171 | | | 10655 | | 10389 |
| E | FRI | 1.153 | 0.211 | | 9231 | | | 12661 | | | 12365 | | | 11594 | | 11463 |
| E | SAT | 1.041 | 0.236 | | 8364 | | | 11395 | | | 11658 | | | 10002 | | 10355 |
| Avg | | 1.000 | 0.243 | | 7346 | | | 11206 | | | 11097 | | | 10131 | | 9945 |
| W | SUN | 0.887 | 0.170 | | 9144 | | | 11197 | | | 10691 | | | 8915 | | 9987 |
| W | MON | 0.998 | 0.118 | | 10336 | | | 11865 | | | 11939 | | | 10820 | | 11240 |
| W | TUE | 0.976 | 0.083 | | 10256 | 10256 | | 11578 | | | 11322 | | | 10769 | | 10981 |
| W | WED | 1.004 | 0.109 | | 10265 | 10265 | | 11780 | | | 12050 | | | 11105 | | 11300 |
| W | THU | 1.029 | 0.125 | | 10362 | | | 12157 | | | 12411 | | | 11387 | | 11579 |
| W | FRI | 1.137 | 0.128 | | 11952 | | | 13489 | | | 13544 | | | 12200 | | 12796 |
| W | SAT | 0.969 | 0.119 | | 10155 | | | 11551 | | | 11610 | | | 10337 | | 10913 |
| Avg | | 1.000 | 0.122 | | 10353 | | | 11945 | | | 11938 | | | 10790 | | 11257 |
| T | SUN | 0.861 | 0.241 | | 14155 | | | 21097 | | | 20524 | | | 17265 | | 18260 |
| T | MON | 0.954 | 0.226 | | 15134 | | | 22552 | | | 22685 | | | 20537 | | 20227 |
| T | TUE | 0.987 | 0.147 | | 17789 | 17789 | | 22721 | | | 22242 | | | 20936 | | 20922 |
| T | WED | 1.014 | 0.142 | | 18465 | 18465 | | 22987 | | | 23036 | | | 21538 | | 21507 |
| T | THU | 1.036 | 0.153 | | 18644 | | | 23605 | | | 23582 | | | 22042 | | 21968 |
| T | FRI | 1.144 | 0.167 | | 21183 | | | 26150 | | | 25909 | | | 23794 | | 24259 |
| T | SAT | 1.003 | 0.173 | | 18519 | | | 22946 | | | 23268 | | | 20339 | | 21268 |
| Avg | | 1.000 | 0.178 | | 17698 | | | 23151 | | | 23035 | | | 20922 | | 21202 |
| I | FACTORS | | | | -0.928 | | | 0.516 | | | 0.486 | | | -0.074 | | |
| R * I | | | | | -0.166 | | | 0.092 | | | 0.087 | | | -0.013 | | |






















Factor = 23035/17698 = 1.30 → February to August
 = 23035/20922 = 1.10 → November to August

APPENDIX B

LEVEL OF SERVICE CALCULATIONS

HCM 2010 Signalized Intersection Summary
1: The Alameda & SR 156

Existing AM
with Seasonal Adjustment

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  |  | |  |  |  |  | |
| Volume (veh/h) | 53 | 566 | 22 | 13 | 1139 | 159 | 55 | 40 | 23 | 126 | 31 | 107 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 3 | 8 | 18 | 7 | 4 | 14 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1696 | 1696 | 1900 | 1712 | 1712 | 1712 | 1900 | 1759 | 1759 | 1810 | 1810 | 1900 |
| Adj Flow Rate, veh/h | 57 | 609 | 24 | 14 | 1225 | 171 | 59 | 43 | 25 | 135 | 33 | 115 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 1 | 0 | 1 | 1 | 1 | 1 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 12 | 12 | 12 | 11 | 11 | 11 | 8 | 8 | 8 | 5 | 5 | 5 |
| Cap, veh/h | 125 | 1318 | 52 | 167 | 1440 | 644 | 108 | 79 | 162 | 233 | 48 | 166 |
| Arrive On Green | 0.08 | 0.42 | 0.42 | 0.10 | 0.44 | 0.44 | 0.11 | 0.11 | 0.11 | 0.13 | 0.13 | 0.13 |
| Sat Flow, veh/h | 1616 | 3162 | 124 | 1630 | 3252 | 1455 | 989 | 721 | 1482 | 1723 | 354 | 1232 |
| Grp Volume(v), veh/h | 57 | 310 | 323 | 14 | 1225 | 171 | 102 | 0 | 25 | 135 | 0 | 148 |
| Grp Sat Flow(s),veh/h/ln | 1616 | 1612 | 1674 | 1630 | 1626 | 1455 | 1710 | 0 | 1482 | 1723 | 0 | 1586 |
| Q Serve(g_s), s | 3.0 | 12.2 | 12.2 | 0.7 | 29.5 | 6.5 | 5.0 | 0.0 | 1.3 | 6.4 | 0.0 | 7.8 |
| Cycle Q Clear(g_c), s | 3.0 | 12.2 | 12.2 | 0.7 | 29.5 | 6.5 | 5.0 | 0.0 | 1.3 | 6.4 | 0.0 | 7.8 |
| Prop In Lane | 1.00 | | 0.07 | 1.00 | | 1.00 | 0.58 | | 1.00 | 1.00 | | 0.78 |
| Lane Grp Cap(c), veh/h | 125 | 672 | 698 | 167 | 1440 | 644 | 186 | 0 | 162 | 233 | 0 | 214 |
| V/C Ratio(X) | 0.46 | 0.46 | 0.46 | 0.08 | 0.85 | 0.27 | 0.55 | 0.00 | 0.15 | 0.58 | 0.00 | 0.69 |
| Avail Cap(c_a), veh/h | 172 | 736 | 765 | 173 | 1485 | 664 | 195 | 0 | 169 | 787 | 0 | 724 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 38.7 | 18.4 | 18.4 | 35.6 | 21.8 | 15.4 | 37.0 | 0.0 | 35.4 | 35.6 | 0.0 | 36.1 |
| Incr Delay (d2), s/veh | 2.6 | 0.7 | 0.7 | 0.2 | 5.0 | 0.3 | 2.9 | 0.0 | 0.4 | 2.3 | 0.0 | 4.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.4 | 5.6 | 5.8 | 0.3 | 14.1 | 2.7 | 2.5 | 0.0 | 0.6 | 3.2 | 0.0 | 3.6 |
| LnGrp Delay(d),s/veh | 41.3 | 19.1 | 19.1 | 35.8 | 26.9 | 15.7 | 39.9 | 0.0 | 35.8 | 37.8 | 0.0 | 40.1 |
| LnGrp LOS | D | B | B | D | C | B | D | | D | D | | D |
| Approach Vol, veh/h | | 690 | | | 1410 | | | 127 | | | 283 | |
| Approach Delay, s/veh | | 21.0 | | | 25.6 | | | 39.1 | | | 39.0 | |
| Approach LOS | | C | | | C | | | D | | | D | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 12.7 | 42.9 | | 17.1 | 10.5 | 45.2 | | 14.8 | | | | |
| Change Period (Y+Rc), s | 3.7 | 6.4 | | 5.3 | 3.7 | 6.4 | | 5.3 | | | | |
| Max Green Setting (Gmax), s | 9.3 | 40.0 | | 40.0 | 9.3 | 40.0 | | 10.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.7 | 14.2 | | 9.8 | 5.0 | 31.5 | | 7.0 | | | | |
| Green Ext Time (p_c), s | 0.0 | 18.4 | | 1.3 | 0.0 | 7.3 | | 0.1 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | | | | 26.5 | | | | | | | | |
| HCM 2010 LOS | | | | C | | | | | | | | |

Intersection

Int Delay, s/veh 0.5

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Vol, veh/h | 2 | 710 | 3 | 17 | 1304 | 4 | 0 | 0 | 19 | 3 | 0 | 7 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | Stop | - | - | Stop |
| Storage Length | 235 | - | - | 145 | - | - | - | - | 50 | - | - | 50 |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 |
| Heavy Vehicles, % | 14 | 14 | 14 | 11 | 11 | 11 | 11 | 11 | 11 | 10 | 10 | 10 |
| Mvmt Flow | 2 | 780 | 3 | 19 | 1433 | 4 | 0 | 0 | 21 | 3 | 0 | 8 |






















| Major/Minor | Major1 | Major2 | Minor1 | Minor2 | | | | | | | | |
|----------------------|--------|--------|--------|--------|---|---|-------|-------|-------|------|------|------|
| Conflicting Flow All | 1437 | 0 | 0 | 784 | 0 | 0 | 2259 | 2261 | 782 | 2259 | 2261 | 1435 |
| Stage 1 | - | - | - | - | - | - | 786 | 786 | - | 1473 | 1473 | - |
| Stage 2 | - | - | - | - | - | - | 1473 | 1475 | - | 786 | 788 | - |
| Critical Hdwy | 4.24 | - | - | 4.21 | - | - | 7.21 | 6.61 | 6.31 | 7.2 | 6.6 | 6.3 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.21 | 5.61 | - | 6.2 | 5.6 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.21 | 5.61 | - | 6.2 | 5.6 | - |
| Follow-up Hdwy | 2.326 | - | - | 2.299 | - | - | 3.599 | 4.099 | 3.399 | 3.59 | 4.09 | 3.39 |
| Pot Cap-1 Maneuver | 437 | - | - | 796 | - | - | 27 | 39 | 380 | 28 | 39 | 157 |
| Stage 1 | - | - | - | - | - | - | 372 | 390 | - | 151 | 183 | - |
| Stage 2 | - | - | - | - | - | - | 151 | 182 | - | 374 | 391 | - |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 437 | - | - | 796 | - | - | 25 | 38 | 380 | 26 | 38 | 157 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 25 | 38 | - | 26 | 38 | - |
| Stage 1 | - | - | - | - | - | - | 370 | 388 | - | 150 | 179 | - |
| Stage 2 | - | - | - | - | - | - | 140 | 178 | - | 352 | 389 | - |

| Approach | EB | WB | NB | SB |
|----------------------|----|-----|----|------|
| HCM Control Delay, s | 0 | 0.1 | 15 | 69.2 |
| HCM LOS | | | C | F |

| Minor Lane/Major Mvmt | NBLn1 | NBLn2 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 | SBLn2 |
|-----------------------|-------|-------|-------|-----|-----|-------|-----|-----|-------|-------|
| Capacity (veh/h) | - | 380 | 437 | - | - | 796 | - | - | 26 | 157 |
| HCM Lane V/C Ratio | - | 0.055 | 0.005 | - | - | 0.023 | - | - | 0.127 | 0.049 |
| HCM Control Delay (s) | 0 | 15 | 13.3 | - | - | 9.6 | - | - | 162.6 | 29.1 |
| HCM Lane LOS | A | C | B | - | - | A | - | - | F | D |
| HCM 95th %tile Q(veh) | - | 0.2 | 0 | - | - | 0.1 | - | - | 0.4 | 0.2 |

HCM 2010 Signalized Intersection Summary
 1: The Alameda & SR 156

Existing PM
 with Seasonal Adjustment

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  |  | |  |  |  |  | |
| Volume (veh/h) | 59 | 1102 | 44 | 13 | 835 | 146 | 36 | 45 | 14 | 138 | 59 | 44 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 3 | 8 | 18 | 7 | 4 | 14 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1810 | 1810 | 1900 | 1776 | 1776 | 1776 | 1900 | 1863 | 1863 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 61 | 1148 | 46 | 14 | 870 | 152 | 38 | 47 | 15 | 144 | 61 | 46 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 1 | 0 | 1 | 1 | 1 | 1 | 0 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 5 | 5 | 5 | 7 | 7 | 7 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 137 | 1453 | 58 | 173 | 1534 | 683 | 85 | 105 | 162 | 224 | 124 | 94 |
| Arrive On Green | 0.08 | 0.43 | 0.43 | 0.10 | 0.45 | 0.45 | 0.10 | 0.10 | 0.10 | 0.13 | 0.13 | 0.13 |
| Sat Flow, veh/h | 1723 | 3369 | 135 | 1691 | 3374 | 1503 | 815 | 1007 | 1562 | 1774 | 984 | 742 |
| Grp Volume(v), veh/h | 61 | 586 | 608 | 14 | 870 | 152 | 85 | 0 | 15 | 144 | 0 | 107 |
| Grp Sat Flow(s),veh/h/ln | 1723 | 1719 | 1785 | 1691 | 1687 | 1503 | 1822 | 0 | 1562 | 1774 | 0 | 1726 |
| Q Serve(g_s), s | 3.0 | 25.8 | 25.8 | 0.7 | 16.6 | 5.4 | 3.8 | 0.0 | 0.8 | 6.8 | 0.0 | 5.1 |
| Cycle Q Clear(g_c), s | 3.0 | 25.8 | 25.8 | 0.7 | 16.6 | 5.4 | 3.8 | 0.0 | 0.8 | 6.8 | 0.0 | 5.1 |
| Prop In Lane | 1.00 | | 0.08 | 1.00 | | 1.00 | 0.45 | | 1.00 | 1.00 | | 0.43 |
| Lane Grp Cap(c), veh/h | 137 | 742 | 770 | 173 | 1534 | 683 | 189 | 0 | 162 | 224 | 0 | 218 |
| V/C Ratio(X) | 0.45 | 0.79 | 0.79 | 0.08 | 0.57 | 0.22 | 0.45 | 0.00 | 0.09 | 0.64 | 0.00 | 0.49 |
| Avail Cap(c_a), veh/h | 183 | 778 | 808 | 179 | 1534 | 683 | 210 | 0 | 180 | 813 | 0 | 790 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 38.6 | 21.5 | 21.5 | 35.6 | 17.6 | 14.5 | 37.0 | 0.0 | 35.6 | 36.5 | 0.0 | 35.7 |
| Incr Delay (d2), s/veh | 2.3 | 5.7 | 5.5 | 0.2 | 0.6 | 0.2 | 1.7 | 0.0 | 0.2 | 3.1 | 0.0 | 1.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.5 | 13.4 | 13.8 | 0.3 | 7.9 | 2.3 | 2.0 | 0.0 | 0.3 | 3.5 | 0.0 | 2.5 |
| LnGrp Delay(d),s/veh | 40.8 | 27.2 | 27.0 | 35.8 | 18.2 | 14.8 | 38.6 | 0.0 | 35.8 | 39.5 | 0.0 | 37.4 |
| LnGrp LOS | D | C | C | D | B | B | D | | D | D | | D |
| Approach Vol, veh/h | | 1255 | | | 1036 | | | 100 | | | 251 | |
| Approach Delay, s/veh | | 27.8 | | | 17.9 | | | 38.2 | | | 38.6 | |
| Approach LOS | | C | | | B | | | D | | | D | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 12.7 | 44.3 | | 16.4 | 10.7 | 46.3 | | 14.4 | | | | |
| Change Period (Y+Rc), s | 3.7 | 6.4 | | 5.3 | 3.7 | 6.4 | | 5.3 | | | | |
| Max Green Setting (Gmax), s | 9.3 | 39.7 | | 40.2 | 9.3 | 39.7 | | 10.1 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.7 | 27.8 | | 8.8 | 5.0 | 18.6 | | 5.8 | | | | |
| Green Ext Time (p_c), s | 0.0 | 10.1 | | 1.0 | 0.0 | 16.7 | | 0.1 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | | | 25.3 | | | | | | | | | |
| HCM 2010 LOS | | | C | | | | | | | | | |

Intersection

Int Delay, s/veh 2.7

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Vol, veh/h | 5 | 1241 | 8 | 44 | 985 | 6 | 2 | 0 | 26 | 11 | 0 | 7 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | Stop | - | - | Stop |
| Storage Length | 235 | - | - | 145 | - | - | - | - | 50 | - | - | 50 |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 |
| Heavy Vehicles, % | 9 | 9 | 9 | 11 | 11 | 11 | 7 | 7 | 7 | 11 | 11 | 11 |
| Mvmt Flow | 5 | 1279 | 8 | 45 | 1015 | 6 | 2 | 0 | 27 | 11 | 0 | 7 |






















| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|----------------------|--------|---|---|--------|---|---|--------|-------|-------|--------|-------|-------|
| Conflicting Flow All | 1022 | 0 | 0 | 1288 | 0 | 0 | 2403 | 2406 | 1284 | 2403 | 2407 | 1019 |
| Stage 1 | - | - | - | - | - | - | 1294 | 1294 | - | 1109 | 1109 | - |
| Stage 2 | - | - | - | - | - | - | 1109 | 1112 | - | 1294 | 1298 | - |
| Critical Hdwy | 4.19 | - | - | 4.21 | - | - | 7.17 | 6.57 | 6.27 | 7.21 | 6.61 | 6.31 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.17 | 5.57 | - | 6.21 | 5.61 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.17 | 5.57 | - | 6.21 | 5.61 | - |
| Follow-up Hdwy | 2.281 | - | - | 2.299 | - | - | 3.563 | 4.063 | 3.363 | 3.599 | 4.099 | 3.399 |
| Pot Cap-1 Maneuver | 653 | - | - | 509 | - | - | 22 | 32 | 196 | 21 | 31 | 276 |
| Stage 1 | - | - | - | - | - | - | 195 | 228 | - | 244 | 275 | - |
| Stage 2 | - | - | - | - | - | - | 249 | 278 | - | 191 | 222 | - |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 653 | - | - | 509 | - | - | 20 | 29 | 196 | 17 | 28 | 276 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 20 | 29 | - | 17 | 28 | - |
| Stage 1 | - | - | - | - | - | - | 194 | 226 | - | 242 | 251 | - |
| Stage 2 | - | - | - | - | - | - | 221 | 253 | - | 164 | 220 | - |

| Approach | EB | WB | NB | SB |
|----------------------|----|-----|----|-------|
| HCM Control Delay, s | 0 | 0.5 | 39 | 254.6 |
| HCM LOS | | | E | F |

| Minor Lane/Major Mvmt | NBLn1 | NBLn2 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 | SBLn2 |
|-----------------------|-------|-------|-------|-----|-----|-------|-----|-----|-------|-------|
| Capacity (veh/h) | 20 | 196 | 653 | - | - | 509 | - | - | 17 | 276 |
| HCM Lane V/C Ratio | 0.103 | 0.137 | 0.008 | - | - | 0.089 | - | - | 0.667 | 0.026 |
| HCM Control Delay (s) | 204.7 | 26.3 | 10.6 | - | - | 12.8 | - | - | 404.9 | 18.4 |
| HCM Lane LOS | F | D | B | - | - | B | - | - | F | C |
| HCM 95th %tile Q(veh) | 0.3 | 0.5 | 0 | - | - | 0.3 | - | - | 1.7 | 0.1 |

HCM 2010 Signalized Intersection Summary
1: The Alameda & SR 156

Existing Plus Project AM
with Seasonal Adjustment

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  |  | |  |  |  |  | |
| Volume (veh/h) | 53 | 566 | 27 | 15 | 1139 | 159 | 72 | 43 | 26 | 126 | 32 | 107 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 3 | 8 | 18 | 7 | 4 | 14 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1696 | 1696 | 1900 | 1712 | 1712 | 1712 | 1900 | 1759 | 1759 | 1810 | 1810 | 1900 |
| Adj Flow Rate, veh/h | 57 | 609 | 29 | 16 | 1225 | 171 | 77 | 46 | 28 | 135 | 34 | 115 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 1 | 0 | 1 | 1 | 1 | 1 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 12 | 12 | 12 | 11 | 11 | 11 | 8 | 8 | 8 | 5 | 5 | 5 |
| Cap, veh/h | 124 | 1303 | 62 | 167 | 1436 | 642 | 118 | 71 | 164 | 233 | 49 | 166 |
| Arrive On Green | 0.08 | 0.42 | 0.42 | 0.10 | 0.44 | 0.44 | 0.11 | 0.11 | 0.11 | 0.14 | 0.14 | 0.14 |
| Sat Flow, veh/h | 1616 | 3133 | 149 | 1630 | 3252 | 1455 | 1068 | 638 | 1482 | 1723 | 362 | 1225 |
| Grp Volume(v), veh/h | 57 | 313 | 325 | 16 | 1225 | 171 | 123 | 0 | 28 | 135 | 0 | 149 |
| Grp Sat Flow(s),veh/h/ln | 1616 | 1612 | 1670 | 1630 | 1626 | 1455 | 1706 | 0 | 1482 | 1723 | 0 | 1587 |
| Q Serve(g_s), s | 3.0 | 12.4 | 12.4 | 0.8 | 29.7 | 6.5 | 6.1 | 0.0 | 1.5 | 6.5 | 0.0 | 7.9 |
| Cycle Q Clear(g_c), s | 3.0 | 12.4 | 12.4 | 0.8 | 29.7 | 6.5 | 6.1 | 0.0 | 1.5 | 6.5 | 0.0 | 7.9 |
| Prop In Lane | 1.00 | | 0.09 | 1.00 | | 1.00 | 0.63 | | 1.00 | 1.00 | | 0.77 |
| Lane Grp Cap(c), veh/h | 124 | 670 | 695 | 167 | 1436 | 642 | 189 | 0 | 164 | 233 | 0 | 215 |
| V/C Ratio(X) | 0.46 | 0.47 | 0.47 | 0.10 | 0.85 | 0.27 | 0.65 | 0.00 | 0.17 | 0.58 | 0.00 | 0.69 |
| Avail Cap(c_a), veh/h | 171 | 733 | 760 | 172 | 1479 | 662 | 194 | 0 | 169 | 784 | 0 | 722 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 38.8 | 18.6 | 18.6 | 35.8 | 22.0 | 15.5 | 37.5 | 0.0 | 35.4 | 35.7 | 0.0 | 36.3 |
| Incr Delay (d2), s/veh | 2.6 | 0.7 | 0.7 | 0.2 | 5.2 | 0.3 | 7.2 | 0.0 | 0.5 | 2.3 | 0.0 | 4.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.4 | 5.6 | 5.8 | 0.4 | 14.3 | 2.7 | 3.2 | 0.0 | 0.6 | 3.2 | 0.0 | 3.7 |
| LnGrp Delay(d),s/veh | 41.5 | 19.3 | 19.3 | 36.0 | 27.2 | 15.9 | 44.7 | 0.0 | 35.9 | 37.9 | 0.0 | 40.3 |
| LnGrp LOS | D | B | B | D | C | B | D | | D | D | | D |
| Approach Vol, veh/h | | 695 | | | 1412 | | | 151 | | | | 284 |
| Approach Delay, s/veh | | 21.1 | | | 25.9 | | | 43.1 | | | | 39.1 |
| Approach LOS | | C | | | C | | | D | | | | D |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 12.7 | 43.0 | | 17.2 | 10.5 | 45.2 | | 15.1 | | | | |
| Change Period (Y+Rc), s | 3.7 | 6.4 | | 5.3 | 3.7 | 6.4 | | 5.3 | | | | |
| Max Green Setting (Gmax), s | 9.3 | 40.0 | | 40.0 | 9.3 | 40.0 | | 10.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.8 | 14.4 | | 9.9 | 5.0 | 31.7 | | 8.1 | | | | |
| Green Ext Time (p_c), s | 0.0 | 18.3 | | 1.3 | 0.0 | 7.1 | | 0.1 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | | | | 27.1 | | | | | | | | |
| HCM 2010 LOS | | | | C | | | | | | | | |

Intersection

Int Delay, s/veh 0.6

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Vol, veh/h | 2 | 713 | 3 | 18 | 1306 | 4 | 0 | 0 | 24 | 3 | 0 | 7 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | Stop | - | - | Stop |
| Storage Length | 235 | - | - | 145 | - | - | - | - | 50 | - | - | 50 |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 |
| Heavy Vehicles, % | 14 | 14 | 14 | 11 | 11 | 11 | 11 | 11 | 11 | 10 | 10 | 10 |
| Mvmt Flow | 2 | 784 | 3 | 20 | 1435 | 4 | 0 | 0 | 26 | 3 | 0 | 8 |






















| Major/Minor | Major1 | Major2 | Minor1 | Minor2 | | | | | | | | |
|----------------------|--------|--------|--------|--------|---|---|-------|-------|-------|------|------|------|
| Conflicting Flow All | 1440 | 0 | 0 | 787 | 0 | 0 | 2267 | 2269 | 785 | 2267 | 2268 | 1437 |
| Stage 1 | - | - | - | - | - | - | 790 | 790 | - | 1477 | 1477 | - |
| Stage 2 | - | - | - | - | - | - | 1477 | 1479 | - | 790 | 791 | - |
| Critical Hdwy | 4.24 | - | - | 4.21 | - | - | 7.21 | 6.61 | 6.31 | 7.2 | 6.6 | 6.3 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.21 | 5.61 | - | 6.2 | 5.6 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.21 | 5.61 | - | 6.2 | 5.6 | - |
| Follow-up Hdwy | 2.326 | - | - | 2.299 | - | - | 3.599 | 4.099 | 3.399 | 3.59 | 4.09 | 3.39 |
| Pot Cap-1 Maneuver | 436 | - | - | 794 | - | - | 27 | 38 | 379 | 27 | 38 | 157 |
| Stage 1 | - | - | - | - | - | - | 370 | 389 | - | 151 | 183 | - |
| Stage 2 | - | - | - | - | - | - | 150 | 181 | - | 372 | 390 | - |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 436 | - | - | 794 | - | - | 25 | 37 | 379 | 25 | 37 | 157 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 25 | 37 | - | 25 | 37 | - |
| Stage 1 | - | - | - | - | - | - | 368 | 387 | - | 150 | 178 | - |
| Stage 2 | - | - | - | - | - | - | 139 | 176 | - | 345 | 388 | - |

| Approach | EB | WB | NB | SB |
|----------------------|----|-----|------|------|
| HCM Control Delay, s | 0 | 0.1 | 15.2 | 71.3 |
| HCM LOS | | | C | F |

| Minor Lane/Major Mvmt | NBLn1 | NBLn2 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 | SBLn2 |
|-----------------------|-------|-------|-------|-----|-----|-------|-----|-----|-------|-------|
| Capacity (veh/h) | - | 379 | 436 | - | - | 794 | - | - | 25 | 157 |
| HCM Lane V/C Ratio | - | 0.07 | 0.005 | - | - | 0.025 | - | - | 0.132 | 0.049 |
| HCM Control Delay (s) | 0 | 15.2 | 13.3 | - | - | 9.7 | - | - | 169.8 | 29.1 |
| HCM Lane LOS | A | C | B | - | - | A | - | - | F | D |
| HCM 95th %tile Q(veh) | - | 0.2 | 0 | - | - | 0.1 | - | - | 0.4 | 0.2 |

HCM 2010 Signalized Intersection Summary
 1: The Alameda & SR 156

Existing Plus Project PM
 with Seasonal Adjustment

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  |  | |  |  |  |  | |
| Volume (veh/h) | 59 | 1102 | 63 | 19 | 835 | 146 | 47 | 47 | 16 | 138 | 62 | 44 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 3 | 8 | 18 | 7 | 4 | 14 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1810 | 1810 | 1900 | 1776 | 1776 | 1776 | 1900 | 1863 | 1863 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 61 | 1148 | 66 | 20 | 870 | 152 | 49 | 49 | 17 | 144 | 65 | 46 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 1 | 0 | 1 | 1 | 1 | 1 | 0 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 5 | 5 | 5 | 7 | 7 | 7 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 136 | 1424 | 82 | 173 | 1531 | 682 | 97 | 97 | 167 | 223 | 127 | 90 |
| Arrive On Green | 0.08 | 0.43 | 0.43 | 0.10 | 0.45 | 0.45 | 0.11 | 0.11 | 0.11 | 0.13 | 0.13 | 0.13 |
| Sat Flow, veh/h | 1723 | 3305 | 190 | 1691 | 3374 | 1503 | 909 | 909 | 1562 | 1774 | 1013 | 717 |
| Grp Volume(v), veh/h | 61 | 597 | 617 | 20 | 870 | 152 | 98 | 0 | 17 | 144 | 0 | 111 |
| Grp Sat Flow(s),veh/h/ln | 1723 | 1719 | 1775 | 1691 | 1687 | 1503 | 1817 | 0 | 1562 | 1774 | 0 | 1730 |
| Q Serve(g_s), s | 3.0 | 26.7 | 26.7 | 0.9 | 16.7 | 5.4 | 4.5 | 0.0 | 0.9 | 6.8 | 0.0 | 5.3 |
| Cycle Q Clear(g_c), s | 3.0 | 26.7 | 26.7 | 0.9 | 16.7 | 5.4 | 4.5 | 0.0 | 0.9 | 6.8 | 0.0 | 5.3 |
| Prop In Lane | 1.00 | | 0.11 | 1.00 | | 1.00 | 0.50 | | 1.00 | 1.00 | | 0.41 |
| Lane Grp Cap(c), veh/h | 136 | 741 | 765 | 173 | 1531 | 682 | 194 | 0 | 167 | 223 | 0 | 217 |
| V/C Ratio(X) | 0.45 | 0.81 | 0.81 | 0.12 | 0.57 | 0.22 | 0.51 | 0.00 | 0.10 | 0.65 | 0.00 | 0.51 |
| Avail Cap(c_a), veh/h | 182 | 774 | 799 | 178 | 1531 | 682 | 208 | 0 | 179 | 809 | 0 | 789 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 38.8 | 21.9 | 21.9 | 36.0 | 17.7 | 14.6 | 37.2 | 0.0 | 35.6 | 36.7 | 0.0 | 36.0 |
| Incr Delay (d2), s/veh | 2.3 | 6.4 | 6.3 | 0.3 | 0.6 | 0.2 | 2.0 | 0.0 | 0.3 | 3.1 | 0.0 | 1.8 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.5 | 13.9 | 14.4 | 0.5 | 7.9 | 2.3 | 2.4 | 0.0 | 0.4 | 3.5 | 0.0 | 2.6 |
| LnGrp Delay(d),s/veh | 41.1 | 28.3 | 28.2 | 36.3 | 18.3 | 14.9 | 39.2 | 0.0 | 35.8 | 39.8 | 0.0 | 37.9 |
| LnGrp LOS | D | C | C | D | B | B | D | | D | D | | D |
| Approach Vol, veh/h | | 1275 | | | 1042 | | | 115 | | | 255 | |
| Approach Delay, s/veh | | 28.8 | | | 18.2 | | | 38.7 | | | 39.0 | |
| Approach LOS | | C | | | B | | | D | | | D | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 12.7 | 44.4 | | 16.4 | 10.7 | 46.4 | | 14.7 | | | | |
| Change Period (Y+Rc), s | 3.7 | 6.4 | | 5.3 | 3.7 | 6.4 | | 5.3 | | | | |
| Max Green Setting (Gmax), s | 9.3 | 39.7 | | 40.2 | 9.3 | 39.7 | | 10.1 | | | | |
| Max Q Clear Time (g_c+I1), s | 2.9 | 28.7 | | 8.8 | 5.0 | 18.7 | | 6.5 | | | | |
| Green Ext Time (p_c), s | 0.0 | 9.3 | | 1.1 | 0.0 | 16.7 | | 0.1 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | | | 26.1 | | | | | | | | | |
| HCM 2010 LOS | | | C | | | | | | | | | |

Intersection

Int Delay, s/veh 2.9

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Vol, veh/h | 5 | 1243 | 8 | 47 | 991 | 6 | 2 | 0 | 29 | 11 | 0 | 7 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | Stop | - | - | Stop |
| Storage Length | 235 | - | - | 145 | - | - | - | - | 50 | - | - | 50 |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 |
| Heavy Vehicles, % | 9 | 9 | 9 | 11 | 11 | 11 | 7 | 7 | 7 | 11 | 11 | 11 |
| Mvmt Flow | 5 | 1281 | 8 | 48 | 1022 | 6 | 2 | 0 | 30 | 11 | 0 | 7 |






















| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|----------------------|--------|---|---|--------|---|---|--------|-------|-------|--------|-------|-------|
| Conflicting Flow All | 1028 | 0 | 0 | 1290 | 0 | 0 | 2418 | 2421 | 1286 | 2418 | 2422 | 1025 |
| Stage 1 | - | - | - | - | - | - | 1296 | 1296 | - | 1122 | 1122 | - |
| Stage 2 | - | - | - | - | - | - | 1122 | 1125 | - | 1296 | 1300 | - |
| Critical Hdwy | 4.19 | - | - | 4.21 | - | - | 7.17 | 6.57 | 6.27 | 7.21 | 6.61 | 6.31 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.17 | 5.57 | - | 6.21 | 5.61 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.17 | 5.57 | - | 6.21 | 5.61 | - |
| Follow-up Hdwy | 2.281 | - | - | 2.299 | - | - | 3.563 | 4.063 | 3.363 | 3.599 | 4.099 | 3.399 |
| Pot Cap-1 Maneuver | 649 | - | - | 508 | - | - | 22 | 31 | 196 | 21 | 30 | 274 |
| Stage 1 | - | - | - | - | - | - | 195 | 227 | - | 240 | 271 | - |
| Stage 2 | - | - | - | - | - | - | 245 | 274 | - | 191 | 222 | - |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 649 | - | - | 508 | - | - | 20 | 28 | 196 | 16 | 27 | 274 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 20 | 28 | - | 16 | 27 | - |
| Stage 1 | - | - | - | - | - | - | 193 | 225 | - | 238 | 245 | - |
| Stage 2 | - | - | - | - | - | - | 216 | 248 | - | 161 | 220 | - |

| Approach | EB | WB | NB | SB |
|----------------------|----|-----|------|-------|
| HCM Control Delay, s | 0 | 0.6 | 38.1 | 276.3 |
| HCM LOS | | | E | F |

| Minor Lane/Major Mvmt | NBLn1 | NBLn2 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 | SBLn2 |
|-----------------------|-------|-------|-------|-----|-----|-------|-----|-----|-------|-------|
| Capacity (veh/h) | 20 | 196 | 649 | - | - | 508 | - | - | 16 | 274 |
| HCM Lane V/C Ratio | 0.103 | 0.153 | 0.008 | - | - | 0.095 | - | - | 0.709 | 0.026 |
| HCM Control Delay (s) | 204.7 | 26.6 | 10.6 | - | - | 12.8 | - | - | 440.3 | 18.5 |
| HCM Lane LOS | F | D | B | - | - | B | - | - | F | C |
| HCM 95th %tile Q(veh) | 0.3 | 0.5 | 0 | - | - | 0.3 | - | - | 1.8 | 0.1 |

HCM 2010 Signalized Intersection Summary
 1: The Alameda & SR 156

Cumulative AM
 with Seasonal Adjustment

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  |  | |  |  |  |  | |
| Volume (veh/h) | 56 | 726 | 77 | 68 | 1431 | 158 | 114 | 54 | 68 | 126 | 46 | 108 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 3 | 8 | 18 | 7 | 4 | 14 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1696 | 1696 | 1900 | 1712 | 1712 | 1712 | 1900 | 1759 | 1759 | 1810 | 1810 | 1900 |
| Adj Flow Rate, veh/h | 59 | 764 | 81 | 72 | 1506 | 166 | 120 | 57 | 72 | 133 | 48 | 114 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 1 | 0 | 1 | 1 | 1 | 1 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 12 | 12 | 12 | 11 | 11 | 11 | 8 | 8 | 8 | 5 | 5 | 5 |
| Cap, veh/h | 103 | 1491 | 158 | 120 | 1681 | 752 | 137 | 65 | 176 | 227 | 63 | 149 |
| Arrive On Green | 0.06 | 0.51 | 0.51 | 0.07 | 0.52 | 0.52 | 0.12 | 0.12 | 0.12 | 0.13 | 0.13 | 0.13 |
| Sat Flow, veh/h | 1616 | 2941 | 312 | 1630 | 3252 | 1455 | 1154 | 548 | 1483 | 1723 | 475 | 1129 |
| Grp Volume(v), veh/h | 59 | 419 | 426 | 72 | 1506 | 166 | 177 | 0 | 72 | 133 | 0 | 162 |
| Grp Sat Flow(s),veh/h/ln | 1616 | 1612 | 1641 | 1630 | 1626 | 1455 | 1702 | 0 | 1483 | 1723 | 0 | 1604 |
| Q Serve(g_s), s | 4.4 | 21.2 | 21.2 | 5.3 | 51.1 | 7.6 | 12.5 | 0.0 | 5.5 | 8.9 | 0.0 | 12.0 |
| Cycle Q Clear(g_c), s | 4.4 | 21.2 | 21.2 | 5.3 | 51.1 | 7.6 | 12.5 | 0.0 | 5.5 | 8.9 | 0.0 | 12.0 |
| Prop In Lane | 1.00 | | 0.19 | 1.00 | | 1.00 | 0.68 | | 1.00 | 1.00 | | 0.70 |
| Lane Grp Cap(c), veh/h | 103 | 817 | 832 | 120 | 1681 | 752 | 203 | 0 | 176 | 227 | 0 | 212 |
| V/C Ratio(X) | 0.57 | 0.51 | 0.51 | 0.60 | 0.90 | 0.22 | 0.87 | 0.00 | 0.41 | 0.59 | 0.00 | 0.77 |
| Avail Cap(c_a), veh/h | 123 | 817 | 832 | 177 | 1724 | 771 | 208 | 0 | 181 | 562 | 0 | 523 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 55.8 | 20.1 | 20.1 | 55.1 | 26.7 | 16.2 | 53.1 | 0.0 | 50.0 | 50.1 | 0.0 | 51.4 |
| Incr Delay (d2), s/veh | 5.0 | 0.7 | 0.7 | 4.8 | 6.7 | 0.2 | 30.6 | 0.0 | 1.5 | 2.4 | 0.0 | 5.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.1 | 9.6 | 9.8 | 2.5 | 24.4 | 3.1 | 7.6 | 0.0 | 2.3 | 4.4 | 0.0 | 5.6 |
| LnGrp Delay(d),s/veh | 60.8 | 20.9 | 20.9 | 59.9 | 33.3 | 16.4 | 83.8 | 0.0 | 51.5 | 52.5 | 0.0 | 57.1 |
| LnGrp LOS | E | C | C | E | C | B | F | | D | D | | E |
| Approach Vol, veh/h | | 904 | | | 1744 | | | 249 | | | 295 | |
| Approach Delay, s/veh | | 23.5 | | | 32.8 | | | 74.4 | | | 55.0 | |
| Approach LOS | | C | | | C | | | E | | | E | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 12.7 | 68.6 | | 21.5 | 11.5 | 69.8 | | 19.9 | | | | |
| Change Period (Y+Rc), s | 3.7 | 6.4 | | 5.3 | 3.7 | 6.4 | | 5.3 | | | | |
| Max Green Setting (Gmax), s | 13.3 | 61.0 | | 40.0 | 9.3 | 65.0 | | 15.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 7.3 | 23.2 | | 14.0 | 6.4 | 53.1 | | 14.5 | | | | |
| Green Ext Time (p_c), s | 0.1 | 29.9 | | 1.4 | 0.0 | 10.3 | | 0.1 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | | | 35.5 | | | | | | | | | |
| HCM 2010 LOS | | | D | | | | | | | | | |

| Intersection | | | | | | | | | | | | |
|------------------|-----|--|--|--|--|--|--|--|--|--|--|--|
| Int Delay, s/veh | 0.8 | | | | | | | | | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Vol, veh/h | 2 | 915 | 3 | 18 | 1650 | 4 | 0 | 0 | 24 | 3 | 0 | 7 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | Stop | - | - | Stop |
| Storage Length | 235 | - | - | 145 | - | - | - | - | 50 | - | - | 50 |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| Heavy Vehicles, % | 14 | 14 | 14 | 11 | 11 | 11 | 11 | 11 | 11 | 10 | 10 | 10 |
| Mvmt Flow | 2 | 963 | 3 | 19 | 1737 | 4 | 0 | 0 | 25 | 3 | 0 | 7 |






















| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|----------------------|--------|---|---|--------|---|---|--------|-------|-------|--------|------|------|
| Conflicting Flow All | 1741 | 0 | 0 | 966 | 0 | 0 | 2746 | 2748 | 965 | 2746 | 2748 | 1739 |
| Stage 1 | - | - | - | - | - | - | 969 | 969 | - | 1777 | 1777 | - |
| Stage 2 | - | - | - | - | - | - | 1777 | 1779 | - | 969 | 971 | - |
| Critical Hdwy | 4.24 | - | - | 4.21 | - | - | 7.21 | 6.61 | 6.31 | 7.2 | 6.6 | 6.3 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.21 | 5.61 | - | 6.2 | 5.6 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.21 | 5.61 | - | 6.2 | 5.6 | - |
| Follow-up Hdwy | 2.326 | - | - | 2.299 | - | - | 3.599 | 4.099 | 3.399 | 3.59 | 4.09 | 3.39 |
| Pot Cap-1 Maneuver | 332 | - | - | 678 | - | - | 12 | 18 | 297 | 12 | 19 | 103 |
| Stage 1 | - | - | - | - | - | - | 294 | 320 | - | 100 | 129 | - |
| Stage 2 | - | - | - | - | - | - | 100 | 128 | - | 295 | 321 | - |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 332 | - | - | 678 | - | - | 11 | 17 | 297 | 11 | 18 | 103 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 11 | 17 | - | 11 | 18 | - |
| Stage 1 | - | - | - | - | - | - | 292 | 318 | - | 99 | 125 | - |
| Stage 2 | - | - | - | - | - | - | 90 | 124 | - | 268 | 319 | - |

| Approach | EB | WB | NB | SB |
|----------------------|----|-----|------|-------|
| HCM Control Delay, s | 0 | 0.1 | 18.2 | 159.6 |
| HCM LOS | | | C | F |

| Minor Lane/Major Mvmt | NBLn1 | NBLn2 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 | SBLn2 |
|-----------------------|-------|-------|-------|-----|-----|-------|-----|-----|-------|-------|
| Capacity (veh/h) | - | 297 | 332 | - | - | 678 | - | - | 11 | 103 |
| HCM Lane V/C Ratio | - | 0.085 | 0.006 | - | - | 0.028 | - | - | 0.287 | 0.072 |
| HCM Control Delay (s) | 0 | 18.2 | 15.9 | - | - | 10.5 | - | - | 432.7 | 42.6 |
| HCM Lane LOS | A | C | C | - | - | B | - | - | F | E |
| HCM 95th %tile Q(veh) | - | 0.3 | 0 | - | - | 0.1 | - | - | 0.7 | 0.2 |

HCM 2010 Signalized Intersection Summary
 1: The Alameda & SR 156

Cumulative PM
 with Seasonal Adjustment

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  |  | |  |  |  |  | |
| Volume (veh/h) | 63 | 1442 | 108 | 63 | 1085 | 146 | 90 | 60 | 61 | 137 | 75 | 44 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 3 | 8 | 18 | 7 | 4 | 14 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1810 | 1810 | 1900 | 1776 | 1776 | 1776 | 1900 | 1863 | 1863 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 66 | 1502 | 112 | 66 | 1130 | 152 | 94 | 62 | 64 | 143 | 78 | 46 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 1 | 0 | 1 | 1 | 1 | 1 | 0 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 5 | 5 | 5 | 7 | 7 | 7 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 115 | 1737 | 129 | 127 | 1834 | 817 | 112 | 74 | 160 | 204 | 126 | 74 |
| Arrive On Green | 0.07 | 0.54 | 0.54 | 0.07 | 0.54 | 0.54 | 0.10 | 0.10 | 0.10 | 0.12 | 0.12 | 0.12 |
| Sat Flow, veh/h | 1723 | 3245 | 241 | 1691 | 3374 | 1504 | 1090 | 719 | 1560 | 1774 | 1096 | 646 |
| Grp Volume(v), veh/h | 66 | 792 | 822 | 66 | 1130 | 152 | 156 | 0 | 64 | 143 | 0 | 124 |
| Grp Sat Flow(s),veh/h/ln | 1723 | 1719 | 1767 | 1691 | 1687 | 1504 | 1808 | 0 | 1560 | 1774 | 0 | 1743 |
| Q Serve(g_s), s | 4.5 | 47.7 | 48.6 | 4.5 | 27.6 | 6.2 | 10.2 | 0.0 | 4.6 | 9.3 | 0.0 | 8.1 |
| Cycle Q Clear(g_c), s | 4.5 | 47.7 | 48.6 | 4.5 | 27.6 | 6.2 | 10.2 | 0.0 | 4.6 | 9.3 | 0.0 | 8.1 |
| Prop In Lane | 1.00 | | 0.14 | 1.00 | | 1.00 | 0.60 | | 1.00 | 1.00 | | 0.37 |
| Lane Grp Cap(c), veh/h | 115 | 920 | 946 | 127 | 1834 | 817 | 185 | 0 | 160 | 204 | 0 | 201 |
| V/C Ratio(X) | 0.57 | 0.86 | 0.87 | 0.52 | 0.62 | 0.19 | 0.84 | 0.00 | 0.40 | 0.70 | 0.00 | 0.62 |
| Avail Cap(c_a), veh/h | 162 | 946 | 972 | 131 | 1834 | 817 | 206 | 0 | 178 | 593 | 0 | 583 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 54.4 | 24.1 | 24.3 | 53.5 | 18.8 | 13.9 | 53.0 | 0.0 | 50.5 | 51.2 | 0.0 | 50.7 |
| Incr Delay (d2), s/veh | 4.5 | 8.3 | 8.7 | 3.4 | 0.7 | 0.2 | 23.8 | 0.0 | 1.6 | 4.3 | 0.0 | 3.1 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.3 | 24.5 | 25.8 | 2.2 | 13.1 | 2.6 | 6.3 | 0.0 | 2.1 | 4.8 | 0.0 | 4.1 |
| LnGrp Delay(d),s/veh | 58.9 | 32.3 | 33.0 | 56.9 | 19.6 | 14.1 | 76.8 | 0.0 | 52.1 | 55.5 | 0.0 | 53.7 |
| LnGrp LOS | E | C | C | E | B | B | E | | D | E | | D |
| Approach Vol, veh/h | | 1680 | | | 1348 | | | 220 | | | 267 | |
| Approach Delay, s/veh | | 33.7 | | | 20.8 | | | 69.6 | | | 54.7 | |
| Approach LOS | | C | | | C | | | E | | | D | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 12.7 | 70.7 | | 19.1 | 11.7 | 71.7 | | 17.6 | | | | |
| Change Period (Y+Rc), s | 3.7 | 6.4 | | 5.3 | 3.7 | 6.4 | | 5.3 | | | | |
| Max Green Setting (Gmax), s | 9.3 | 66.1 | | 40.2 | 11.3 | 64.1 | | 13.7 | | | | |
| Max Q Clear Time (g_c+I1), s | 6.5 | 50.6 | | 11.3 | 6.5 | 29.6 | | 12.2 | | | | |
| Green Ext Time (p_c), s | 0.0 | 13.7 | | 1.1 | 0.0 | 30.5 | | 0.2 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | | | 32.6 | | | | | | | | | |
| HCM 2010 LOS | | | C | | | | | | | | | |

HCM 2010 TWSC
2: Mission Vineyard Rd/Breen Rd & SR 156

Cumulative PM
with Seasonal Adjustment

| Intersection | | | | | | | | | | | | |
|------------------|------|--|--|--|--|--|--|--|--|--|--|--|
| Int Delay, s/veh | 10.3 | | | | | | | | | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Vol, veh/h | 5 | 1627 | 8 | 47 | 1285 | 6 | 2 | 0 | 29 | 11 | 0 | 7 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | Stop | - | - | Stop |
| Storage Length | 235 | - | - | 145 | - | - | - | - | 50 | - | - | 50 |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 |
| Heavy Vehicles, % | 9 | 9 | 9 | 11 | 11 | 11 | 7 | 7 | 7 | 11 | 11 | 11 |
| Mvmt Flow | 5 | 1677 | 8 | 48 | 1325 | 6 | 2 | 0 | 30 | 11 | 0 | 7 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|----------------------|--------|---|---|--------|---|---|--------|-------|-------|--------|-------|-------|
| Conflicting Flow All | 1331 | 0 | 0 | 1686 | 0 | 0 | 3117 | 3120 | 1681 | 3117 | 3121 | 1328 |
| Stage 1 | - | - | - | - | - | - | 1692 | 1692 | - | 1425 | 1425 | - |
| Stage 2 | - | - | - | - | - | - | 1425 | 1428 | - | 1692 | 1696 | - |
| Critical Hdwy | 4.19 | - | - | 4.21 | - | - | 7.17 | 6.57 | 6.27 | 7.21 | 6.61 | 6.31 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.17 | 5.57 | - | 6.21 | 5.61 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.17 | 5.57 | - | 6.21 | 5.61 | - |
| Follow-up Hdwy | 2.281 | - | - | 2.299 | - | - | 3.563 | 4.063 | 3.363 | 3.599 | 4.099 | 3.399 |
| Pot Cap-1 Maneuver | 496 | - | - | 356 | - | - | 7 | 11 | 114 | ~ 6 | 10 | 181 |
| Stage 1 | - | - | - | - | - | - | 115 | 145 | - | 161 | 193 | - |
| Stage 2 | - | - | - | - | - | - | 164 | 196 | - | 112 | 141 | - |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 496 | - | - | 356 | - | - | 6 | 9 | 114 | ~ 4 | 9 | 181 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 6 | 9 | - | ~ 4 | 9 | - |
| Stage 1 | - | - | - | - | - | - | 114 | 144 | - | 159 | 167 | - |
| Stage 2 | - | - | - | - | - | - | 136 | 170 | - | 82 | 140 | - |























| Approach | EB | WB | NB | SB |
|----------------------|----|-----|------|-----------|
| HCM Control Delay, s | 0 | 0.6 | 95.7 | \$ 1517.1 |
| HCM LOS | | | F | F |

| Minor Lane/Major Mvmt | NBLn1 | NBLn2 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 | SBLn2 |
|-----------------------|----------|-------|------|-----|-----|-------|-----|-----|-----------|-------|
| Capacity (veh/h) | 6 | 114 | 496 | - | - | 356 | - | - | 4 | 181 |
| HCM Lane V/C Ratio | 0.344 | 0.262 | 0.01 | - | - | 0.136 | - | - | 2.835 | 0.04 |
| HCM Control Delay (s) | \$ 795.8 | 47.4 | 12.3 | - | - | 16.7 | - | - | \$ 2466.2 | 25.7 |
| HCM Lane LOS | F | E | B | - | - | C | - | - | F | D |
| HCM 95th %tile Q(veh) | 0.7 | 1 | 0 | - | - | 0.5 | - | - | 2.6 | 0.1 |

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon























HCM 2010 Signalized Intersection Summary
1: The Alameda & SR 156

Cumulative AM
with Seasonal Adjustment and Improvement

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  | |  |  |  |  | |
| Volume (veh/h) | 56 | 726 | 77 | 68 | 1431 | 158 | 114 | 54 | 68 | 126 | 46 | 108 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 3 | 8 | 18 | 7 | 4 | 14 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1696 | 1696 | 1696 | 1712 | 1712 | 1712 | 1900 | 1759 | 1759 | 1810 | 1810 | 1900 |
| Adj Flow Rate, veh/h | 59 | 764 | 81 | 72 | 1506 | 166 | 120 | 57 | 72 | 133 | 48 | 114 |
| Adj No. of Lanes | 1 | 2 | 1 | 1 | 2 | 1 | 0 | 1 | 1 | 1 | 1 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 12 | 12 | 12 | 11 | 11 | 11 | 8 | 8 | 8 | 5 | 5 | 5 |
| Cap, veh/h | 103 | 1634 | 903 | 120 | 1681 | 752 | 137 | 65 | 176 | 227 | 63 | 149 |
| Arrive On Green | 0.06 | 0.51 | 0.51 | 0.07 | 0.52 | 0.52 | 0.12 | 0.12 | 0.12 | 0.13 | 0.13 | 0.13 |
| Sat Flow, veh/h | 1616 | 3223 | 1442 | 1630 | 3252 | 1455 | 1154 | 548 | 1483 | 1723 | 475 | 1129 |
| Grp Volume(v), veh/h | 59 | 764 | 81 | 72 | 1506 | 166 | 177 | 0 | 72 | 133 | 0 | 162 |
| Grp Sat Flow(s),veh/h/ln | 1616 | 1612 | 1442 | 1630 | 1626 | 1455 | 1702 | 0 | 1483 | 1723 | 0 | 1604 |
| Q Serve(g_s), s | 4.4 | 18.8 | 2.7 | 5.3 | 51.1 | 7.6 | 12.5 | 0.0 | 5.5 | 8.9 | 0.0 | 12.0 |
| Cycle Q Clear(g_c), s | 4.4 | 18.8 | 2.7 | 5.3 | 51.1 | 7.6 | 12.5 | 0.0 | 5.5 | 8.9 | 0.0 | 12.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.68 | | 1.00 | 1.00 | | 0.70 |
| Lane Grp Cap(c), veh/h | 103 | 1634 | 903 | 120 | 1681 | 752 | 203 | 0 | 176 | 227 | 0 | 212 |
| V/C Ratio(X) | 0.57 | 0.47 | 0.09 | 0.60 | 0.90 | 0.22 | 0.87 | 0.00 | 0.41 | 0.59 | 0.00 | 0.77 |
| Avail Cap(c_a), veh/h | 122 | 1634 | 903 | 177 | 1723 | 771 | 208 | 0 | 181 | 562 | 0 | 523 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 55.8 | 19.5 | 9.1 | 55.1 | 26.7 | 16.2 | 53.1 | 0.0 | 50.0 | 50.1 | 0.0 | 51.4 |
| Incr Delay (d2), s/veh | 5.0 | 0.3 | 0.1 | 4.8 | 6.7 | 0.2 | 30.7 | 0.0 | 1.5 | 2.4 | 0.0 | 5.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.1 | 8.3 | 1.5 | 2.5 | 24.4 | 3.1 | 7.6 | 0.0 | 2.3 | 4.4 | 0.0 | 5.6 |
| LnGrp Delay(d),s/veh | 60.8 | 19.8 | 9.1 | 59.9 | 33.3 | 16.4 | 83.8 | 0.0 | 51.6 | 52.5 | 0.0 | 57.1 |
| LnGrp LOS | E | B | A | E | C | B | F | | D | D | | E |
| Approach Vol, veh/h | | 904 | | | 1744 | | | 249 | | | 295 | |
| Approach Delay, s/veh | | 21.6 | | | 32.8 | | | 74.5 | | | 55.0 | |
| Approach LOS | | C | | | C | | | E | | | E | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 12.7 | 68.6 | | 21.5 | 11.5 | 69.8 | | 19.9 | | | | |
| Change Period (Y+Rc), s | 3.7 | 6.4 | | 5.3 | 3.7 | 6.4 | | 5.3 | | | | |
| Max Green Setting (Gmax), s | 13.3 | 61.0 | | 40.0 | 9.3 | 65.0 | | 15.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 7.3 | 20.8 | | 14.0 | 6.4 | 53.1 | | 14.5 | | | | |
| Green Ext Time (p_c), s | 0.1 | 31.6 | | 1.4 | 0.0 | 10.3 | | 0.1 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | | | 34.9 | | | | | | | | | |
| HCM 2010 LOS | | | C | | | | | | | | | |

HCM 2010 Signalized Intersection Summary
 1: The Alameda & SR 156

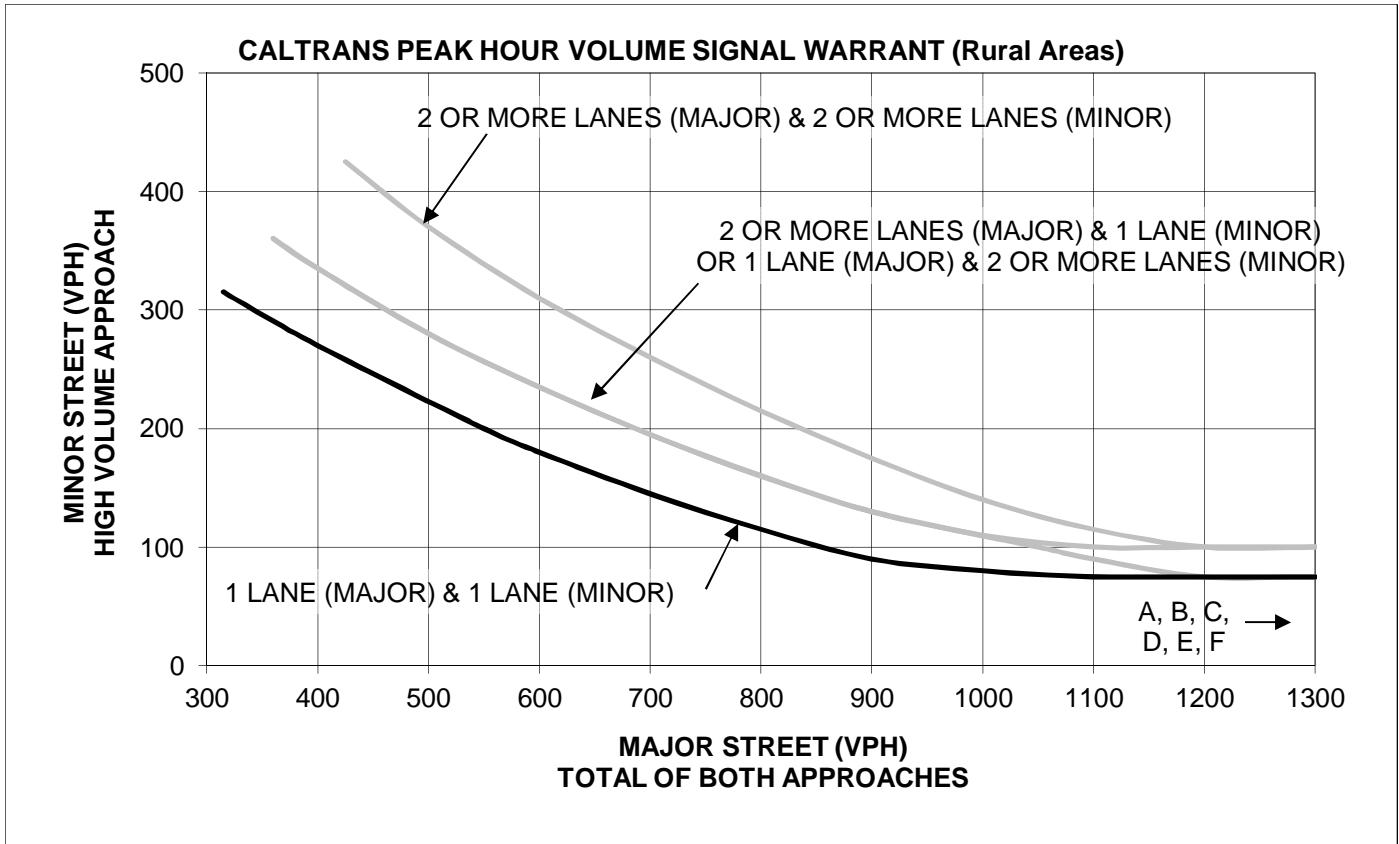
Cumulative PM
 with Seasonal Adjustment and Improvement

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  | |  |  |  |  | |
| Volume (veh/h) | 63 | 1442 | 108 | 63 | 1085 | 146 | 90 | 60 | 61 | 137 | 75 | 44 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 3 | 8 | 18 | 7 | 4 | 14 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1810 | 1810 | 1810 | 1776 | 1776 | 1776 | 1900 | 1863 | 1863 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 66 | 1502 | 112 | 66 | 1130 | 152 | 94 | 62 | 64 | 143 | 78 | 46 |
| Adj No. of Lanes | 1 | 2 | 1 | 1 | 2 | 1 | 0 | 1 | 1 | 1 | 1 | 0 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 5 | 5 | 5 | 7 | 7 | 7 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 115 | 1836 | 978 | 127 | 1830 | 815 | 112 | 74 | 161 | 204 | 126 | 74 |
| Arrive On Green | 0.07 | 0.53 | 0.53 | 0.08 | 0.54 | 0.54 | 0.10 | 0.10 | 0.10 | 0.12 | 0.12 | 0.12 |
| Sat Flow, veh/h | 1723 | 3438 | 1535 | 1691 | 3374 | 1504 | 1090 | 719 | 1569 | 1774 | 1096 | 646 |
| Grp Volume(v), veh/h | 66 | 1502 | 112 | 66 | 1130 | 152 | 156 | 0 | 64 | 143 | 0 | 124 |
| Grp Sat Flow(s),veh/h/ln | 1723 | 1719 | 1535 | 1691 | 1687 | 1504 | 1808 | 0 | 1569 | 1774 | 0 | 1743 |
| Q Serve(g_s), s | 4.4 | 43.3 | 3.4 | 4.5 | 27.6 | 6.2 | 10.1 | 0.0 | 4.6 | 9.3 | 0.0 | 8.1 |
| Cycle Q Clear(g_c), s | 4.4 | 43.3 | 3.4 | 4.5 | 27.6 | 6.2 | 10.1 | 0.0 | 4.6 | 9.3 | 0.0 | 8.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.60 | | 1.00 | 1.00 | | 0.37 |
| Lane Grp Cap(c), veh/h | 115 | 1836 | 978 | 127 | 1830 | 815 | 186 | 0 | 161 | 204 | 0 | 201 |
| V/C Ratio(X) | 0.57 | 0.82 | 0.11 | 0.52 | 0.62 | 0.19 | 0.84 | 0.00 | 0.40 | 0.70 | 0.00 | 0.62 |
| Avail Cap(c_a), veh/h | 163 | 1899 | 1006 | 131 | 1830 | 815 | 207 | 0 | 180 | 596 | 0 | 586 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 54.2 | 23.1 | 8.5 | 53.2 | 18.8 | 13.9 | 52.7 | 0.0 | 50.2 | 50.9 | 0.0 | 50.4 |
| Incr Delay (d2), s/veh | 4.4 | 3.0 | 0.1 | 3.3 | 0.7 | 0.2 | 23.6 | 0.0 | 1.6 | 4.3 | 0.0 | 3.1 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.3 | 21.2 | 1.9 | 2.2 | 12.9 | 2.6 | 6.3 | 0.0 | 2.1 | 4.8 | 0.0 | 4.1 |
| LnGrp Delay(d),s/veh | 58.6 | 26.1 | 8.6 | 56.5 | 19.6 | 14.1 | 76.3 | 0.0 | 51.8 | 55.2 | 0.0 | 53.5 |
| LnGrp LOS | E | C | A | E | B | B | E | | D | E | | D |
| Approach Vol, veh/h | | 1680 | | | 1348 | | | 220 | | | 267 | |
| Approach Delay, s/veh | | 26.2 | | | 20.8 | | | 69.2 | | | 54.4 | |
| Approach LOS | | C | | | C | | | E | | | D | |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 12.7 | 70.3 | | 19.1 | 11.7 | 71.3 | | 17.6 | | | | |
| Change Period (Y+Rc), s | 3.7 | 6.4 | | 5.3 | 3.7 | 6.4 | | 5.3 | | | | |
| Max Green Setting (Gmax), s | 9.3 | 66.1 | | 40.2 | 11.3 | 64.1 | | 13.7 | | | | |
| Max Q Clear Time (g_c+I1), s | 6.5 | 45.3 | | 11.3 | 6.4 | 29.6 | | 12.1 | | | | |
| Green Ext Time (p_c), s | 0.0 | 18.6 | | 1.1 | 0.0 | 30.5 | | 0.2 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | | | 29.0 | | | | | | | | | |
| HCM 2010 LOS | | | C | | | | | | | | | |

APPENDIX C

WARRANT
WORKSHEETS

Warrant 3A - Peak-Hour Warrant



| Scenario | SR 156 | Mis.Vin.-Breen | Warrant |
|------------------|-----------|----------------|---------|
| | East/West | North/South | Met? |
| A. Existing AM | 2040 | 19 | No |
| B. Existing PM | 2289 | 28 | No |
| C. Ex+Pro AM | 2046 | 24 | No |
| D. Ex+Pro PM | 2300 | 31 | No |
| E. Cumulative AM | 2592 | 24 | No |
| F. Cumulative PM | 2978 | 31 | No |

Notes:

1. 100 VPH applies as the lower threshold volume for a minor street approach with two or more lanes

Warrant 3B - Peak-Hour Delay (Urban)

Warrant 3 (Part B) - Peak Hour Delay
Mission Vineyard Road - Breen Road / State Route 156

Number of Approaches to Intersection: **800**

Total Entering Volumes:

Minimum Entering Vehicles:

4 approaches
 2,069 vehicles
 2,335 vehicles
 2,080 vehicles
 2,349 vehicles
 2,626 vehicles
 3,027 vehicles

Existing AM:
 Existing PM:
 Ex+Pro AM:
 Ex+Pro PM:
 Cumulative AM:
 Cumulative PM:

| Street | Direction | Scenario | Peak Hour | No. of Stopped Vehicles | Average Vehicle Delay (sec) | Total Vehicle Delay (sec) | Total Delay (hours) | Min. 4 Veh-Hrs of Delay? (Approach) | At least 100 Veh? (Approach) | At least 800 Veh? (Intersection) | Warrant Met? |
|------------------|-----------|------------|-----------|-------------------------|-----------------------------|---------------------------|---------------------|-------------------------------------|------------------------------|----------------------------------|--------------|
| Mission Vineyard | NB | Existing | AM | 19 | 15.0 | 285 | 0.08 | NO | NO | Yes | NO |
| Breen | SB | Existing | AM | 10 | 68.8 | 688 | 0.19 | NO | NO | Yes | NO |
| Mission Vineyard | NB | Existing | PM | 28 | 39.0 | 1092 | 0.30 | NO | NO | Yes | NO |
| Breen | SB | Existing | PM | 18 | 254.6 | 4583 | 1.27 | NO | NO | Yes | NO |
| Mission Vineyard | NB | Ex+Pro | AM | 24 | 15.2 | 365 | 0.10 | NO | NO | Yes | NO |
| Breen | SB | Ex+Pro | AM | 10 | 71.3 | 713 | 0.20 | NO | NO | Yes | NO |
| Mission Vineyard | NB | Ex+Pro | PM | 31 | 38.1 | 1181 | 0.33 | NO | NO | Yes | NO |
| Breen | SB | Ex+Pro | PM | 18 | 276.3 | 4973 | 1.38 | NO | NO | Yes | NO |
| Mission Vineyard | NB | Cumulative | AM | 24 | 18.2 | 437 | 0.12 | NO | NO | Yes | NO |
| Breen | SB | Cumulative | AM | 10 | 159.6 | 1596 | 0.44 | NO | NO | Yes | NO |
| Mission Vineyard | NB | Cumulative | PM | 31 | 95.7 | 2967 | 0.82 | NO | NO | Yes | NO |
| Breen | SB | Cumulative | PM | 18 | 1517.1 | 27308 | 7.59 | Yes | NO | Yes | NO |

Notes:

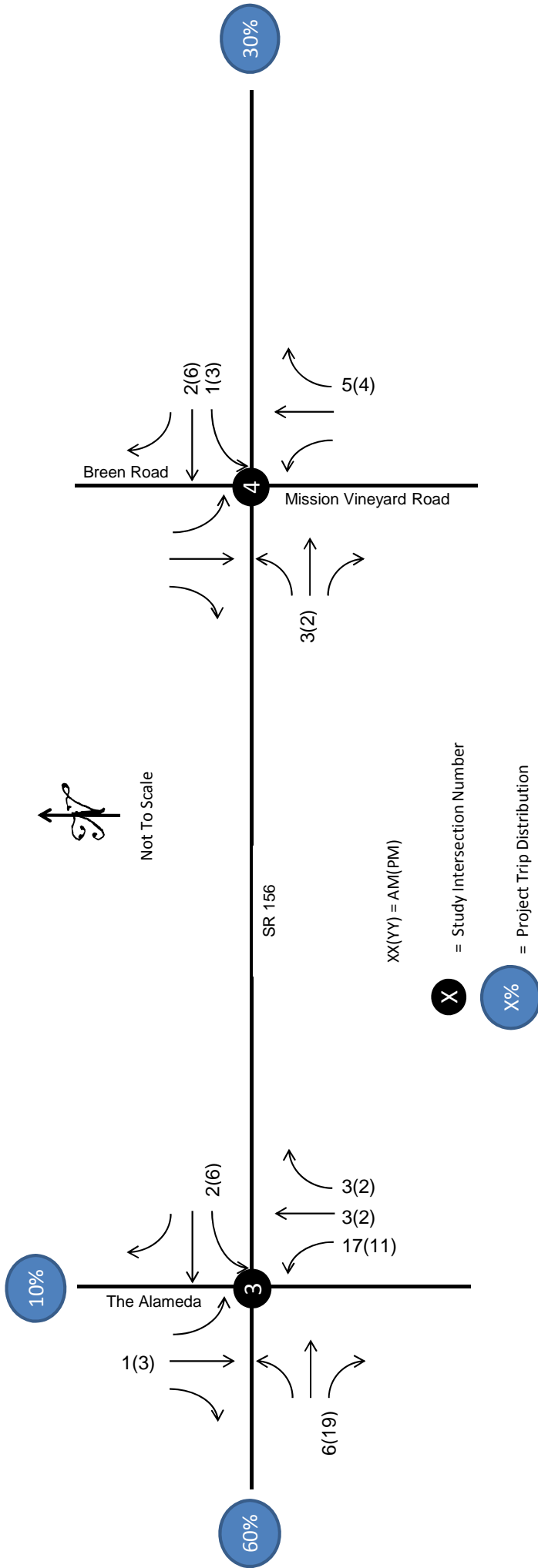
1. Warrant based
2. NB, SB, EB, WB = Northbound, Southbound, Eastbound, Westbound.



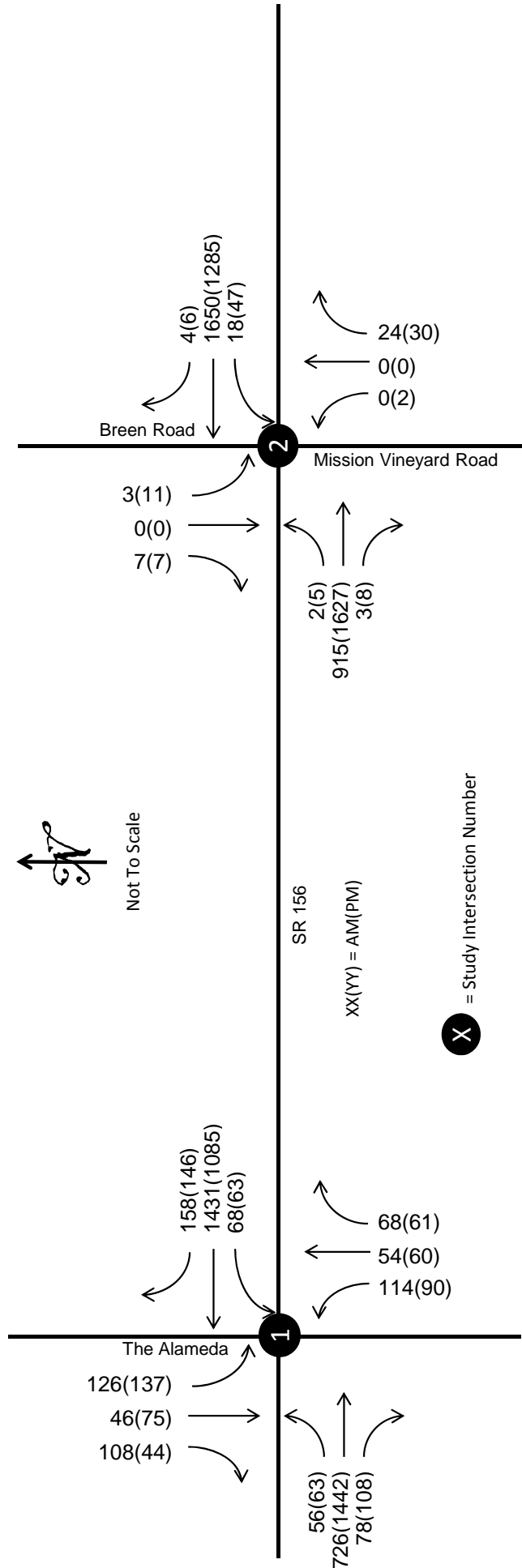
Hatch Mott
 MacDonald

APPENDIX D

VOLUME AND
IMPROVEMENT ANALYSIS
CHANGES
WITH
REVISED
PROJECT
DEFINTION
(i.e. 45 Units)



Project Trip Distribution
and Assignment
AM and PM Peak Hour Volumes
(45 Units)


























Cumulative Conditions
AM and PM Peak Hour Volumes
(45 Units)



HCM 2010 Signalized Intersection Summary
 1: The Alameda & SR 156

Cumulative AM
 with Seasonal Adjustment and Improvement (45 Units)

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  |  | |  |  |  |  |  |
| Volume (veh/h) | 56 | 726 | 78 | 68 | 1431 | 158 | 114 | 54 | 68 | 126 | 46 | 108 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 3 | 8 | 18 | 7 | 4 | 14 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1696 | 1696 | 1696 | 1712 | 1712 | 1712 | 1900 | 1759 | 1759 | 1810 | 1810 | 1900 |
| Adj Flow Rate, veh/h | 59 | 764 | 82 | 72 | 1506 | 166 | 120 | 57 | 72 | 133 | 48 | 114 |
| Adj No. of Lanes | 1 | 2 | 1 | 1 | 2 | 1 | 0 | 1 | 1 | 1 | 1 | 0 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 12 | 12 | 12 | 11 | 11 | 11 | 8 | 8 | 8 | 5 | 5 | 5 |
| Cap, veh/h | 103 | 1634 | 903 | 120 | 1681 | 752 | 137 | 65 | 177 | 227 | 63 | 149 |
| Arrive On Green | 0.06 | 0.51 | 0.51 | 0.07 | 0.52 | 0.52 | 0.12 | 0.12 | 0.12 | 0.13 | 0.13 | 0.13 |
| Sat Flow, veh/h | 1616 | 3223 | 1442 | 1630 | 3252 | 1455 | 1154 | 548 | 1488 | 1723 | 475 | 1129 |
| Grp Volume(v), veh/h | 59 | 764 | 82 | 72 | 1506 | 166 | 177 | 0 | 72 | 133 | 0 | 162 |
| Grp Sat Flow(s),veh/h/ln | 1616 | 1612 | 1442 | 1630 | 1626 | 1455 | 1702 | 0 | 1488 | 1723 | 0 | 1604 |
| Q Serve(g_s), s | 4.4 | 18.8 | 2.8 | 5.3 | 51.1 | 7.6 | 12.5 | 0.0 | 5.5 | 8.9 | 0.0 | 12.0 |
| Cycle Q Clear(g_c), s | 4.4 | 18.8 | 2.8 | 5.3 | 51.1 | 7.6 | 12.5 | 0.0 | 5.5 | 8.9 | 0.0 | 12.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.68 | | 1.00 | 1.00 | | 0.70 |
| Lane Grp Cap(c), veh/h | 103 | 1634 | 903 | 120 | 1681 | 752 | 203 | 0 | 177 | 227 | 0 | 212 |
| V/C Ratio(X) | 0.57 | 0.47 | 0.09 | 0.60 | 0.90 | 0.22 | 0.87 | 0.00 | 0.41 | 0.59 | 0.00 | 0.77 |
| Avail Cap(c_a), veh/h | 122 | 1634 | 903 | 177 | 1723 | 771 | 208 | 0 | 182 | 562 | 0 | 523 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 55.8 | 19.5 | 9.1 | 55.1 | 26.7 | 16.2 | 53.1 | 0.0 | 50.0 | 50.1 | 0.0 | 51.4 |
| Incr Delay (d2), s/veh | 5.0 | 0.3 | 0.1 | 4.8 | 6.7 | 0.2 | 30.7 | 0.0 | 1.5 | 2.4 | 0.0 | 5.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.1 | 8.3 | 1.5 | 2.5 | 24.4 | 3.1 | 7.6 | 0.0 | 2.3 | 4.4 | 0.0 | 5.6 |
| LnGrp Delay(d),s/veh | 60.8 | 19.8 | 9.2 | 59.9 | 33.3 | 16.4 | 83.8 | 0.0 | 51.5 | 52.5 | 0.0 | 57.1 |
| LnGrp LOS | E | B | A | E | C | B | F | | D | D | | E |
| Approach Vol, veh/h | | 905 | | | 1744 | | | 249 | | | | 295 |
| Approach Delay, s/veh | | 21.5 | | | 32.8 | | | 74.5 | | | | 55.0 |
| Approach LOS | | C | | | C | | | E | | | | E |
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
| Phs Duration (G+Y+Rc), s | 12.7 | 68.6 | | 21.5 | 11.5 | 69.8 | | 19.9 | | | | |
| Change Period (Y+Rc), s | 3.7 | 6.4 | | 5.3 | 3.7 | 6.4 | | 5.3 | | | | |
| Max Green Setting (Gmax), s | 13.3 | 61.0 | | 40.0 | 9.3 | 65.0 | | 15.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 7.3 | 20.8 | | 14.0 | 6.4 | 53.1 | | 14.5 | | | | |
| Green Ext Time (p_c), s | 0.1 | 31.7 | | 1.4 | 0.0 | 10.3 | | 0.1 | | | | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2010 Ctrl Delay | | | 34.9 | | | | | | | | | |
| HCM 2010 LOS | | | C | | | | | | | | | |