Appendix G

Transportation and Circulation Supplemental Information

Appendix G-1

Inputs for Traffic Model

Memo

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Date: November 25, 2015

To: Crystal Jacobson, Stephanie Holloway (Placer County), Lucia Maloney, Karen Fink, Keith Norberg (TRPA), and Gordon Shaw (LSC Transportation Consultants)

From: Adam Lewandowski, AICP

Subject: Placer County Tahoe Basin Area Plan, 2035 Land Use Forecasts for each Alternative

This memorandum describes the land use forecasts that were developed to reflect the build-out of each Area Plan alternative by the year 2035. These land use forecasts were incorporated into the TRPA transportation model to evaluate the transportation effects of each Area Plan alternative. Regional land use forecasts were prepared for the 2012 Regional Plan Update EIS, as described in the Regional Plan Update (RPU) Draft EIS Appendix E, Part 7 "Methodology for estimating VMT and GHG emissions in the draft Regional Plan Update, draft Regional Plan Update EIS, Draft RTP, and draft RTP EIR/EIS". The 2035 land use forecast for the adopted RPU (Alternative 3 in the RPU EIS) and the 2010 baseline conditions from the RPU EIS were used as the starting point to develop land use forecasts for the Area Plan alternatives. The RPU land use forecasts for the Placer County portion of the Tahoe Region were revised, as described below, to reflect the specific provisions included in each Area Plan Alternative.

Revisions that Apply to All Alternatives

- **2015 Baseline**: The RPU 2010 baseline land use scenario was updated to reflect the 21 residential allocations assigned to projects in Placer County since the RPU was adopted. Residential units were assigned to the Transportation Analysis Zones (TAZ) where the approved residential projects occurred, based on Placer County and TRPA data. Assumptions about occupancy rates and income categories reflected the existing model assumptions within each TAZ, which are based on census data.

- **Cumulative Projects within the Tahoe Region:** The list of cumulative projects within the Tahoe Basin was reviewed to determine if any projects were not reflected in the RPU 2035 land use scenario. Only the proposed Brockway Campground was not already accounted for in the RPU land use scenario. To reflect this project, 2,200 Persons-At-One-Time (PAOT) allocations were added to the TAZ that contains the project site. This reflects 4 PAOTs per proposed campsite, consistent with TRPA Code requirements for the allocation of PAOTs. This project could occur under any alternative, including the no-project alternative, so the PAOTS were added in the same way in the 2035 build-out scenario for each alternative.

Revisions that Apply to Each Alternative

The following revisions apply to the four alternatives. The land use scenario changes described below were reflected in the 2035 build-out analysis and cumulative analysis for each alternative.

Alternative 1 Scenario

- **Town Center Boundary Change:** Under Alternative 1, a portion of the Tahoe City Town Center in TAZ 160 would be removed from the Town Center, and a portion of TAZ 158 would be added to the Town Center. Differences between the RPU 2010 and 2035 land use scenarios in TAZ 160 were compared to determine if any transfers of residential development or increases in CFA or TAUs were assumed to occur in this portion of the Town Center. This review found that no new commercial, tourist, or transfer of residential development were assumed to occur in TAZ 160 under the RPU 2035 land use scenario. Therefore, no changes to TAZ 160 were needed to reflect the removal of a portion of the Town Center from this TAZ. The portion of TAZ 158 to be added to the Town Center is within the Tahoe City Lodge Project Area. The proposed use of this area is known and will be evaluated for the project. No changes to land use assumptions in TAZ 158 were necessary to reflect the inclusion of a portion of the Town Center in this TAZ. (See bullet "Tahoe City Lodge Project" below.)

- **CFA to TAU Conversions:** Under Alternative 1, existing or unassigned CFA could be converted to TAUs at a ratio of 450 sq. ft. of CFA to 1 TAU. The program would be limited to a total of 400 TAUs, which would be restricted to Town Centers. To reflect this provision, 400 TAUs were added to TAZs containing Town Centers. The additional TAUs were split evenly between the Tahoe City and Kings Beach Town Centers (no additional TAUs were added to the North Stateline Town Center), and 120 of the TAUs assigned to Tahoe City were placed in the TAZ that contains the Tahoe City Lodge project, to reflect TAUs required for that project. A total of 180,000 sq. ft. of CFA was removed from the Area Plan to reflect CFA that would no longer be available. This CFA was removed from the six TAZs in the vicinity of Tahoe City and Kings Beach that had the greatest assumed growth in commercial uses under the RPU land use scenario. The CFA reductions were converted to reductions in employment using the existing percentages of employment type in the TRPA transportation model (30% retail, 39% service, 31% other), and the existing ratios of employees per sq. ft. of CFA (retail = 1 employee per 600 sq. ft.; service = 1 employee per 172 sq. ft.; and other = 1 employee per 273 sq. ft.).

- **Secondary Residential Units:** Secondary residential units would be allowed on parcels less than 1 acre within .25 miles of transit, subject to allocation requirements. The locations of transit stops were compared to TAZ boundaries. Due to the size and configuration of the TAZs, transit services were relatively evenly distributed among TAZs. Therefore, the distribution of residential units between TAZs was not changed to reflect an increase in secondary units near transit.

  Secondary residential units would tend to be more moderately priced than single family residential units due to their smaller size. Thus, the proportion of moderate-income units was revised to reflect the construction of secondary units. There is little information available to predict the exact number of secondary units that would be developed under this alternative. To develop a reasonable assumption, existing data on the number of secondary units permitted within Placer County as a whole, and within the Tahoe portion of Placer County (on lots larger than 1 acre) was evaluated. This data showed that on average 5% of the new residential units permitted anywhere in Placer County from 2011 through 2014 were secondary units. A similar trend occurred in the Tahoe portion of Placer County, where 5% of the new residential units permitted were secondary units.

  Data was also gathered from the City of South Lake Tahoe's certified local government housing program, which allows for the conversion of existing illegal secondary units into legal units, subject to allocation requirements. This information showed that an average of 2.5 secondary residential units were permitted per year under the City's program. If a comparable number of secondary residential units were assumed to be developed in Placer County each year, it would reflect approximately 5% of the new residential units projected to be developed by 2035.

Based on this information, it was assumed that an additional 5% of the new residential units would be secondary residential units created under the Area Plan provisions. To reflect this in the land use scenario, 5% of the projected new residential units in Placer County, or a total of 25 units (499 new residential units x 0.05 = 25 units) were changed from the high income category to the moderate income category. The changes were distributed proportionately to each "plan area" (West Shore, Greater Tahoe City, North Tahoe West, and North Tahoe East) based on the projected residential growth in each plan area. Within each plan area the changes were distributed among those TAZs that included the greatest projected growth in residential units.

- **Tahoe City Lodge Project**: The CFA changes described above under "CFA to TAU conversions", reflected the proposed Tahoe City Lodge Project. More than the 26,304 sq. ft. of CFA proposed for conversion under the project were removed from the TAZ that includes the project site (TAZ 158), and more than the 118 TAUs proposed for the project were added to the TAZ.

- **Town Center Zoning Districts**: The proposed Town Center zoning districts were reviewed against the RPU land use scenario. Within the Tahoe City Town Center, one zoning district that contains Common's Beach is proposed to be rezoned from The Tahoe City Community Plan, Special Area 3 to Mixed-Use Recreation in the Area Plan. In the RPU land use scenario, this area was assumed to receive new CFA allocations. To reflect the Area Plan zoning, the CFA assigned to this TAZ was redistributed to adjacent TAZs within the Tahoe City Town Center.

- **Kings Beach Center Design Concept:** The TAZs containing the Kings Beach Center Design Concept were reviewed to ensure they contained enough new CFA and TAU allocations to reflect either of the Kings Beach Center Design Concept options being considered in the EIR/EIS. Adequate new commodities were already assigned to these TAZs and no changes were made to the RPU land use scenario.

Alternative 2 Scenario

- **Secondary Residential Units:** Under Alternative 2, deed-restricted affordable **s**econdary residential units would be allowed on parcels less than 1 acre. Because these units would be affordable units, the proportion of low-income units was increased slightly to reflect the secondary units. These were reflected in the land use scenario as described under Alternative 1, except 5% of the new occupied residential units (or a total of 25 units) were changed from the moderate-income category to the low-income category, rather than being changed from the high to moderate income categories, as under Alternative 1.

- **Tahoe City Lodge Project:** The TAZ containing the Tahoe City Lodge Project site (TAZ 158) was reviewed to ensure it contained enough new CFA and TAU allocations to reflect the reduced scale Tahoe City Lodge alternative (59 TAUs). No changes were made to the RPU land use scenario.

- **Town Center Zoning Districts**: The same reallocation of CFA within the Tahoe City Town Center described under Alternative 1 was performed for Alternative 2, to reflect proposed zoning districts.

- **Kings Beach Center Design Concept:** The TAZs containing the Kings Beach Center Design Concept were reviewed to ensure they contained enough new CFA and TAU allocations to reflect either Kings Beach Center Design Concept option, as described above. No changes were made to the RPU land use scenario.

Alternative 3 Scenario

- **Town Center Density Limits:** This alternative would provide a 25% density bonus to deed-restricted affordable housing projects within Town Centers. This provision would likely result in an increased

number of low-income residential units within a Town Center and a corresponding decrease in units outside of Town Centers. Little information is available to predict the exact change in the distribution of residential units that would occur as a result of this provision. A financial feasibility analysis prepared during the 2012 Regional Plan update (BAE 2012) was used to generate reasonable assumptions on the effects the increased density provision.

The financial feasibility analysis evaluated the feasibility of several generic development proposals under different combinations of TDR transfer ratios and costs. The financial feasibility analysis used a residual land value approach, which determined the amount of money available to purchase land after the development costs, profit, and sales revenue were accounted for. The analysis determined that a development scenario would be feasible if a residual land value of at least $5/sq. ft. remained, which represents the low end of the costs to acquire land in the Tahoe Region.

The residual land value approach lends itself to evaluating changes in density, because an increase in density would reduce the amount of land needed to construct the same number of units. The 25% density bonus for deed-restricted affordable housing would result in a maximum density of 31.25 units/acre compared to a maximum of 25 units/acre without the density bonus. As a result, to construct the same number of units as a project not using the density bonus, a project using the density bonus would only need approximately 80% of the land area.

In the BAE analysis, a residential project with small units was evaluated under four separate scenarios of TDR transfer ratios and cost in the financial feasibility analysis, with three scenarios found to be financially feasible, and one scenario shown to be not feasible. To estimate the effect of the density bonus on financial feasibility, the residual land values for these four scenarios were divided by 0.8 to determine the residual land value under an increased density scenario where only 80% of the land area was needed.

Under all four scenarios, the residual land value was greater with the increased density, indicating that any scenario would be somewhat more feasible with the density bonus. However, the project scenario that was not feasible under the standard density limit did not become feasible with the density bonus. Because the density bonus was not found to make otherwise unfeasible project scenarios feasible, a conservative estimate of a 2% increase in the number of new units in Town Centers (or 9 units) was used to reflect the effects of the density bonus. These additional residential units were distributed roughly evenly between TAZs in the Tahoe City and Kings Beach Town Centers, and were assigned to the low-income category to reflect the required deed-restriction. An equal number of residential units were removed from TAZs outside of Town Centers. These nine residential units were removed from the five TAZs outside of Town Centers that had the highest number of residential units.

- **Town Center Boundary Change:** The modified Tahoe City Town Center boundaries were evaluated as described under Alternative 1 and no changes were made to the RPU land use scenario to reflect this change.

- **CFA to TAU Conversions:** Existing or unassigned CFA could be converted to TAUs at a ratio of 450 sq. ft. of CFA to 1 TAU. The program would be limited to a total of 200 TAUs, which would be restricted to Town Centers. This provision was reflected consistent with the approach used for Alternative 1, except a total of 200 TAUs were added and a total of 90,000 sq. ft. of CFA was removed.

- **Secondary Residential Units:** This alternative would allow second residential units on parcels less than 1 acre anywhere residential uses are allowed. This provision was reflected the same as the similar provision in Alternative 1.

- **Tahoe City Lodge Project**: The CFA changes described above under "CFA to TAU conversions", reflected the proposed Tahoe City Lodge Project. More than the 26,304 sq. ft. of CFA proposed for conversion under the project were removed from the TAZ that includes the project site, and more than the 118 TAUs proposed for the project were added to the TAZ.

- **Town Center Zoning Districts**: The same reallocation of CFA within the Tahoe City Town Center described under Alternative 1 was performed for this alternative.

- **Kings Beach Center Design Concept:** The TAZs containing the Kings Beach Center Design Concept were reviewed to ensure they contained enough new CFA and TAU allocations to reflect either Kings Beach Center Design Concept option under consideration in the EIR/EIS. No changes were made to the RPU land use scenario.

Alternative 4 Scenario

- **Town Center Density Limits:** This alternative would limit residential density to 15 units/acre consistent with existing community plans, compared to the 25 units/acre reflected in the RPU land use scenario. The effects of this density reduction were evaluated using the financial feasibility analysis prepared for the RPU (BAE 2012), similar to the approach described under Alternative 3. To construct the same number of units that could be constructed at 25 units/acre, approximately 160% of the land area would be needed at 15 units/acre. In the BAE analysis, three separate residential project types (small units, large units, and mixed use) were each evaluated under four separate scenarios of TDR ratios and costs, for a total of 12 scenarios. Of these scenarios eight were determined to be feasible and four were not feasible at 25 units/acre. When the residual land value was adjusted to reflect the increased land area needed at 15 units/acre, only seven scenarios were feasible and five were not feasible. This represents a 12.5% decrease in the number of development scenarios that were feasible with the reduced density.

  Based on the reduction in the financial feasibility of projects, an approximate 12.5% decrease in the number of new residential units in Town Centers (or 64 units) was included in the land use scenario to reflect the reduced density limit. These residential units were removed from the Town Center TAZs that were projected to receive the greatest number of new residential units under the RPU land use scenario. These units were then redistributed between the TAZs outside of Town Centers that had the highest number of residential parcels.

- **Mixed-Use Areas Outside Town Centers:** This alternative would not update allowable uses in mixed-use areas outside of Town Centers (i.e., Village Centers in the Area Plan), as assumed in the RPU. The TAZs that include mixed-use areas outside Town Centers were reviewed to determine if the RPU land use scenario assigned any new residential units to these existing commercial areas. In all cases the TAZs that contain these mixed-use areas also include existing residential neighborhoods, which would account for any residential units added to these TAZs; or the TAZs containing mixed-use areas did not receive new residential units under the RPU land use scenario. No changes were made to reflect this provision of Alternative 4.

Appendix G-2

Traffic Volumes and VMT

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MEMORANDUM

To: Nanette Hansel, Ascent Environmental

From: Gordon Shaw, PE, AICP, LSC Transportation Consultants, Inc.

Date: May 27, 2016

RE: Traffic Volumes and VMT for Placer Area Plan EIR/EIS

This memo presents the traffic volumes and VMT forecast for the forecasting to be used in the traffic analysis elements of the EIR/EIS for the Placer Area Plan.

Existing Traffic Volumes

Intersection PM peak-hour traffic volumes for busy summer conditions were drawn from the following sources, and represent the most recent available counts.

- State Route (SR) 89 / SR 28 (Tahoe City Wye) – SR 89/Fanny Bridge Community Revitalization Project Draft EIR/EIS/EA
- SR 28 / Mackinaw Road – LSC traffic count conducted 7/21/15
- SR 28 / Grove Street – SR 89/Fanny Bridge Community Revitalization Project Draft EIR/EIS/EA
- SR 28 / SR 267 – LSC traffic count conducted 8/1/2014
- SR 28 / Bear Street – LSC traffic count conducted 7/29/2011
- SR 28 / Coon Street – Fehr and Peers count conducted 9/4/2015

2035 Project Scenario Traffic Volumes

<u>Existing Plus Project Alternative Scenarios</u>

These scenarios include TRPA regional growth through 2035 as well as the impacts of the Area Plan and Tahoe City Lodge alternatives, but do not include additional external growth in traffic. These project scenario traffic volumes were developed as follows:

1. As discussed elsewhere, 2035 land use forecasts under each of the Area Plan alternatives were developed by Ascent Environmental staff, and approved by Placer County and TRPA staffs. These forecasts were prepared for each of the 60 Traffic Analysis Zones (TAZs) in the TRPA TransCAD region-wide transportation model.

2. TRPA staff then converted the land use forecasts into the variables used in the TransCAD model, and ran the model for each of the four Placer Area Plan alternatives, as well as the existing "base case". Not that the alternative model runs assumed development in the remainder of the Tahoe Region, as well as within the Placer County portion of the Region, and did not reflect the traffic reassignment associated with the Fanny Bridge Community Revitalization Project.

3. LSC then used the traffic volume forecasts at the key study intersection for each of the model runs as provided by TRPA, and developed a growth factor for each movement and for each alternative. While the TRPA TransCAD model was developed to accurately model the major intersections (such as SR 28/SR 89 and SR 28/SR 267), it was not designed to model every individual public street intersection. Specifically, many of the TAZs encompass areas with multiple local public streets. As an example, all of the commercial area of Kings Beach north of SR 28, east of SR 267 and west of Chipmunk Street is a single TAZ. As a result, the model assigns traffic through only a few "TAZ centroid connectors", rather than specifically on the individual public streets. In both Kings Beach (at Bear Street and Coon Street) and Tahoe City (at Grove Street), the overall growth of traffic volumes on local roadways was used to identify growth factors, and assigned to all movements with a capacity to accommodate traffic growth. While this is sufficient to reflect the overall impacts of the Area Plan alternatives, the resulting peak-hour turning movements into and out of the side streets reflect general overall growth in each community, rather than site-specific land use plans.

4. The summer PM peak-hour impact of Tahoe City Lodge was next calculated. As the TRPA model includes land use on the Lodge property which differed from the final alternative land uses due to changes in the alternatives, the trip generation associated with the land use quantities assumed by TRPA staff under each alternative was calculated and distributed to the roadway network using the distribution pattern also used by LSC. Next, the Lodge land uses specifically identified under each alternative were used to identify trip generation and distributed to result in turning movements. The alternative land use peak-hour volumes were added, and the peak-hour volumes associated with the TRPA model assumption land use were subtracted.

5. At the SR 89/SR 28 intersection, the approved Fanny Bridge Community Revitalization Project will change traffic volumes, through the provision of a new roadway connecting SR 89 south of this intersection with SR 89 west of this intersection. The Draft EIR traffic analysis for this project was reviewed to identify the proportion of traffic change on each movement between the future no-project condition and the future plus-project condition. The resulting factor was applied to the results of steps 1 through 4.

The resulting 2035 busy summer peak-hour volumes are shown in Table A.

Future Cumulative Analysis

A review of the TRPA TransCAD forecasts at the two external access points in the Placer County area (SR 89 just south of Alpine Meadows Road, and SR 267 at Brockway Summit)

indicated that the model reflects some but not all of the potential growth in external traffic volumes at these two points. The additional external traffic growth was defined as follows.

On the **SR 267** external corridor, the Town of Truckee maintains a separate TransCAD model. Because of the strong interaction of trips between the Town and the Martis Valley portion of Placer County, the area encompassed by this model includes the Town of Truckee, the Martis Valley area, and also several parcels of unincorporated Nevada County (including the Tahoe Truckee Airport). This model was recently updated. Important to this discussion, the model area extends south on SR 267 to Brockway Summit (making it directly adjacent to the TRPA Model area), and extends south on SR 89 to just south of West River Street (leaving an intervening area between the two models, encompassing Squaw Valley and Alpine Meadows).

The land use growth in the most recent Truckee/Martis model reflect the buildout of the Town of Truckee General Plan (assumed to occur in 2035), as well as the buildout of the current maximum land use growth under the Martis Valley Community Plan (MVCP). Since adoption of the MVCP in 2004, several major developments have been approved with maximum buildout levels below those identified in the MVCP, while other properties have been purchased for public open space. As a result, the current maximum buildout trip generation of the MVCP area is 35 percent lower than that identified in the MVCP EIR.

The current Truckee/Martis Model identifies existing summer PM peak-hour traffic volumes (total of both direction) over Brockway Summit of 1,055 vehicle-trips, and a buildout (assumed 2035) summer PM peak-hour volume forecast of 1,347 vehicle-trips. This reflects a 28 percent increase in traffic volumes.

As an aside, the Truckee/Martis Model assumes development of 760 single-family dwelling units on Southern Pacific Industries (SPI) lands, along with 17,000 square feet of commercial development. The currently proposed Martis Valley West project on these SPI lands would consist of 560 single family dwelling units (including 60 cabins), 200 multi-family dwelling units, and 34,500 square feet of commercial development. As multifamily units have a lower trip generation rate than single family units, the current land use proposal would generate 3 percent less external PM peak-hour vehicle-trips than the land uses assumed in the Truckee/Martis Model. This indicates that there is no need to add trips to reflect this specific development. To be conservative, however, and as the Martis Valley West project has not been approved, no reduction in the Truckee/Martis Model volume has been taken.

The Truckee/Martis Model forecasted growth is higher than the TRPA Model forecasted growth by 63 southbound vehicle-trips and 126 northbound vehicle-trips in the summer PM peak-hour. It is therefore appropriate and conservative (resulting in relatively high traffic forecasts) to add the incremental volume (Truckee/Martis Model volume minus TRPA Model volume) to the external volume growth at Brockway Summit. This adjustment to external traffic was then tracked through the Tahoe roadway system, based upon LSC's trip distribution.

For the **SR 89** external corridor, there is no existing transportation model encompassing the Squaw Valley / Alpine Meadows area[1]. Based upon the current status of land use proposals, the traffic forecasts associated with the following projects were summed:

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[1] The Truckee/Martis model area only extends as far south on SR 89 as West River Street. As a result of the intervening 9-mile gap between the two model areas and the significant traffic generators within this gap, the Truckee/Martis model does not produce forecasts useful to this analysis, necessitating the need for the alternative methodology.

- Village at Squaw Valley (as reflected in the *Village At Squaw Valley Specific Plan DEIR* (Ascent Environmental, May 2015).

- Plumpjack Squaw Valley Inn (as reflected in working draft documents). The DEIR is currently being prepared.

- Palisades at Squaw (as reflected in working draft documents). The DEIR is currently being prepared.

- Alpine Sierra Subdivision (as reflected in working draft documents). The DEIR is currently being prepared.

There are also several smaller potential developments currently under consideration in the Squaw Valley/Alpine Meadows area. In addition, these developments do not constitute the full potential development under the community plans. However, given the substantial level of overall development, it is reasonable to assume that in total they represent the market-driven development that could actually occur by 2035.

The resulting sum of volumes were found to exceed the TRPA Model growth volumes associated with development in Squaw Valley and Alpine Meadows at the SR 89 external point[2] by a total of 121 southbound vehicle-trips and 128 northbound vehicle-trips over the summer PM peak hour. These volumes were assigned to SR 89 at the external point, and then distributed through the remainder of the Tahoe roadway system based on LSC's trip distribution.

For the SR 89/SR28 intersection, these additional external volumes were adjusted to reflect the Fanny Bridge Community Revitalization Project redistribution of traffic. The resulting busy summer 2035 PM peak-hour volumes are presented in Table B. These volumes are then added to those shown in Table A to result in the future cumulative busy summer 2035 PM peak-hour volumes shown in Table C.

VMT Analysis

The analysis of Vehicle-Miles of Travel (VMT) generated in the Tahoe Basin over a busy summer day in 2035 is summarized in Table D. The basis of the analysis are the basin-wide VMT figures output by the TRPA TransCAD model for the four alternatives. These figures were then adjusted as follows:

- As discussed above, the land use assumptions for the Tahoe City Lodge site incorporated into the TransCAD model differ slightly from the current alternative land use assumptions for two of the four alternatives. As shown in Table E, the summer daily VMT generated by the land uses assumed in the model were calculated, based upon the trip generation and distribution factors used in the remainder of the analysis as well as the roadway miles between the Lodge site and the various trip origins/destinations. These figures were subtracted from the model results. The same methodology was

[2] A portion of the TRPA model growth forecasts at the external point are associated with growth in Squaw Valley/Alpine Meadows (while the remainder are associated with growth in travel between the Tahoe Basin and Truckee or points beyond Truckee). Based on turning movements along SR 89, it is estimated that 33 percent of the total future model growth is associated with Squaw Valley / Alpine Meadows growth. The additional TRPA Model growth figures were therefore reduced by 33 percent, thereby increasing the volumes added at the external point.

used to estimate the summer daily VMT generated by the proposed land uses under each alternative at buildout, as also shown in Table E, and added to the model volumes, resulting in a slight net change for Alternatives 1 and 3.

- Consistent with the methodology used in the analysis of VMT for the TRPA Regional Plan and Regional Transportation Plan, a reduction from the model VMT was applied to reflect factors (such as improvements in transit, bicycle, pedestrian and Transportation Demand Management programs) that are not reflected in the model analysis[3]. Per Table 9 of Appendix C: Modeling Methodology of the *Draft Regional Transportation Plan EIR/EIS*, the model outputs for each alternative were reduced by 2.0 percent to reflect the reductions on trips generated within the Tahoe Region. Consideration was also given to whether additional VMT reductions would result from the adoption of the Placer County Tahoe Basin Area Plan (over and above the Regional Plan reductions). The Placer County Tahoe Basin Area Plan includes a number of policy elements that would, if implemented, reduce auto use. In particular, Transportation Policies T-P-11 through T-P-23 present general policies to encourage pedestrian, bicyclist and transit travel by encouraging improved facilities, safer travel corridors, expanded bicycle parking, etc. However, the proposed policies are not significantly more aggressive in enhancing non-auto travel modes than the existing Community Plans, nor does the proposed Area Plan include specific implementation steps (such as new funding sources) to ensure implementation of the policies. As such, and to provide a conservative estimate of future traffic conditions, no further reductions in traffic volumes or VMT are applied to reflect changes in transportation policies.

- As discussed above, the TRPA model partially but not wholly reflects the potential impacts of development external to the Tahoe Region, specifically in the Squaw Valley/Alpine Meadows and the Truckee/Martis Valley areas. An analysis of the additional VMT within the Tahoe Region associated with this development not captured in the TRPA VMT figures is presented in Table F:

    - For the **SR 267** external point, the daily traffic identified in the recently-updated Truckee/Martis Valley model was distributed from the external point at Brockway Summit to specific areas within the Tahoe Region using LSC's distribution to estimate the growth in daily vehicle-trips to each internal area. The same procedure was applied to the TRPA model external daily traffic growth. Subtracting the lower TRPA model volume from the higher Truckee/Martis model volume yielded the additional daily vehicle-trips. This volume was multiplied by the highway travel distance for each trip pair and summed over all trips, to yield the additional VMT figure of 12,616 over a busy summer day through this external point.

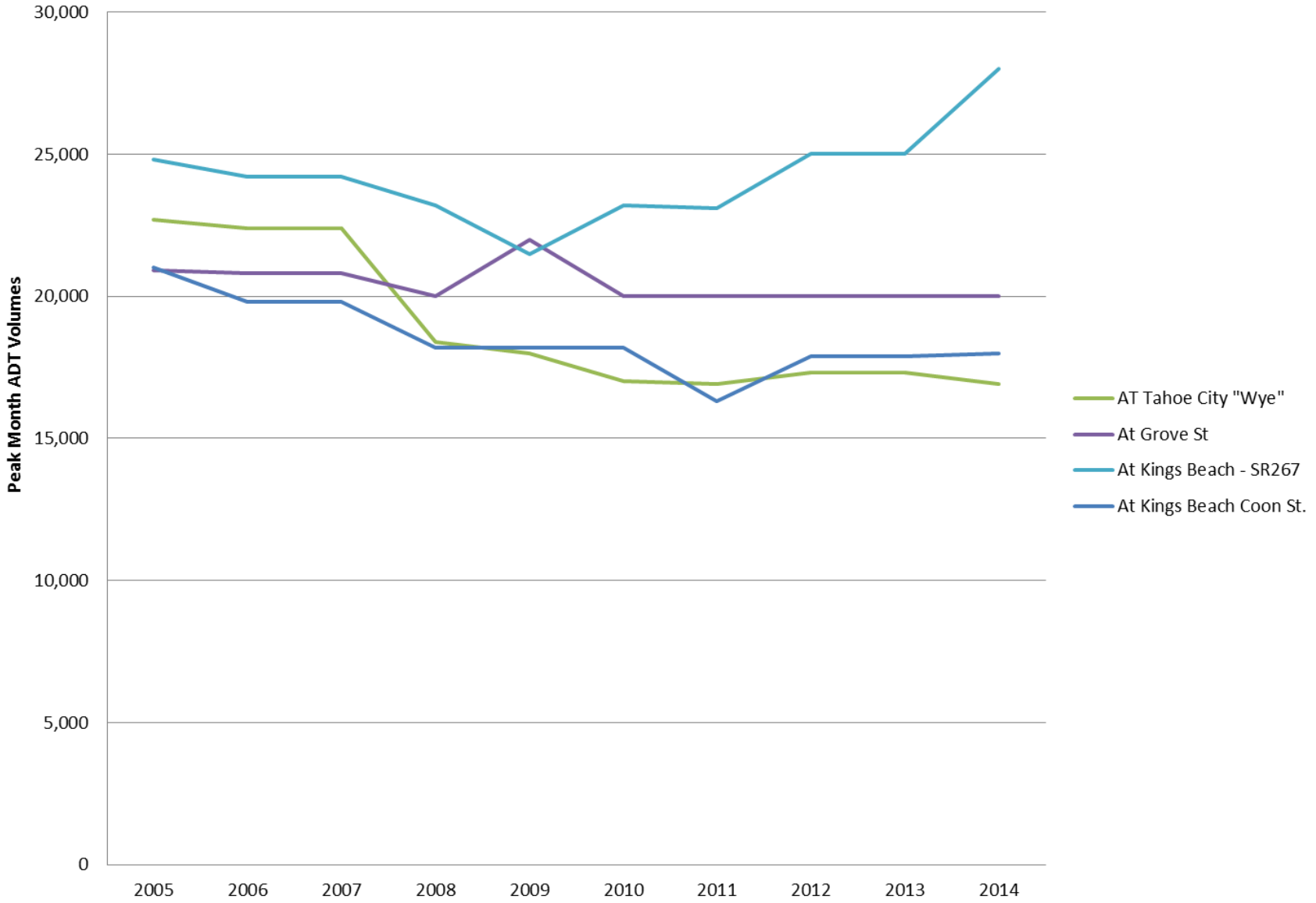
    - For the **SR 89** external point, the total daily traffic growth identified by the TRPA model was divided into traffic volume growth associated with increased travel between the Tahoe Region and Squaw Valley/Alpine Meadows versus traffic volume growth associated with increased travel between the Tahoe Region and Truckee or points beyond Truckee (such as I-80 over Donner Summit). Based on current trip patterns, one third of the traffic growth was assigned to the Squaw Valley / Alpine Meadows area and two thirds to Truckee and beyond. This

[3] To quantify this reduction, TRPA developed the Trip Reduction Impact Analysis (TRIA) tool, as described in Appendix C of the 2012 TRPA Regional Transportation Plan.

indicates that the TRPA model projects a growth of 328 daily vehicle-trips between the Tahoe Region and Squaw Valley/Alpine Meadows. The daily traffic volumes at the SR 89 external point resulting from four current developments in the Squaw Valley / Alpine Meadows area (Village at Squaw Valley, Plumpjack expansion, Alpine Sierra, and Palisades at Squaw) were summed, indicating daily traffic volume growth of 3,132 vehicle-trips. The external volume for the sum of the four developments was distributed to the various destination/origin areas with the Tahoe Region based on LSC distribution. The same methodology was applied to the TRPA external trip daily growth volume, and then subtracted to yield the additional growth between the SR 89 external point and each origin/destination. The resulting additional volumes were then multiplied by the highway trip length between the external point and each internal area, and summed. As shown in Table F, the additional VMT through this external point is estimated to be 29,861. Between the two external points, cumulative summer daily VMT is estimated to be increased by 42,477.

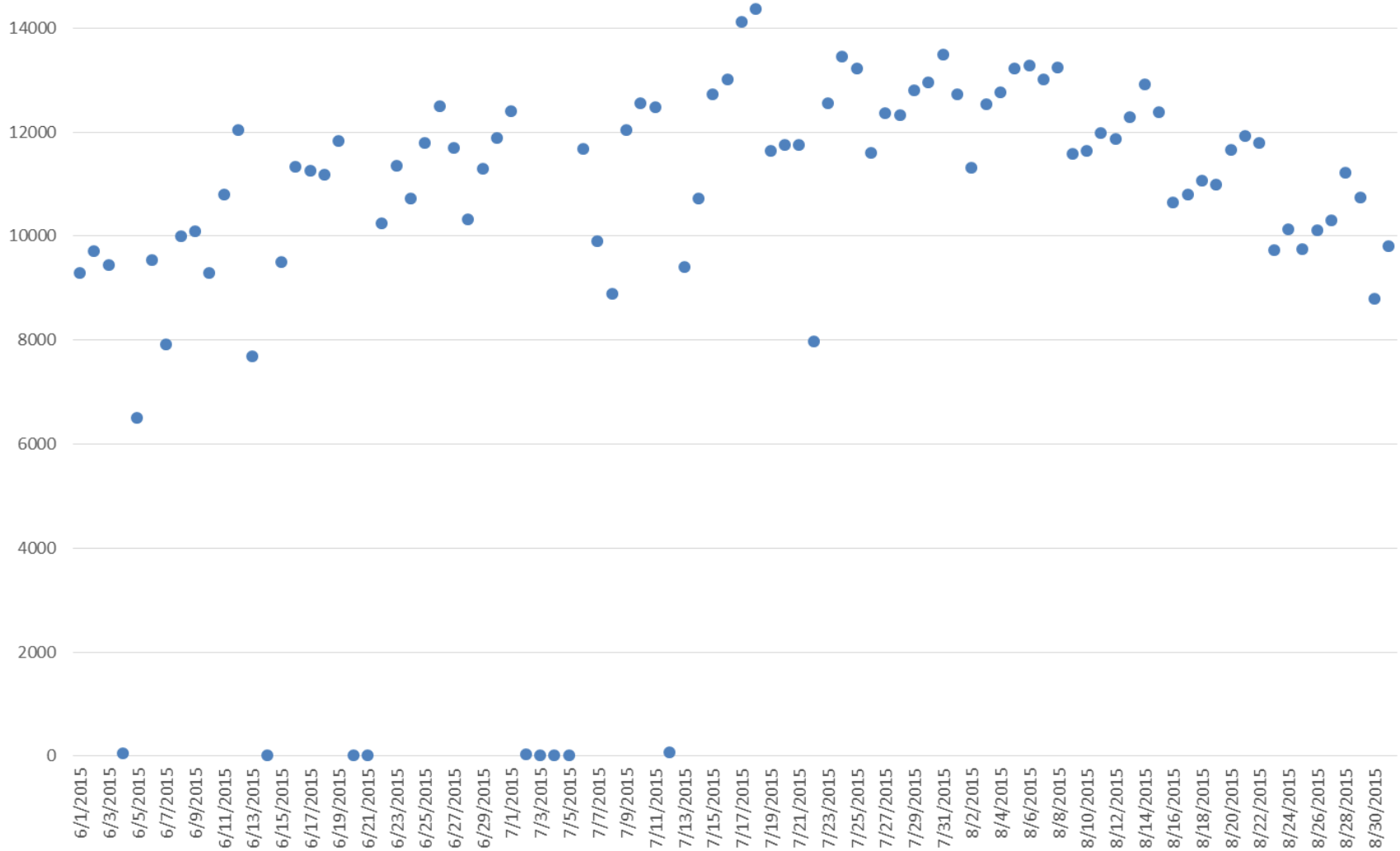
- This additional external VMT would also be reduced by the non-auto policies in the Regional Plan, though at a lower degree. Per Table 9 of Appendix C: Modeling Methodology of the *Draft Regional Transportation Plan EIR/EIS*, this adjustment for non-auto transportation strategies for internal-external trips is 0.78 percent resulting in a small reduction.

The resulting VMT estimates are shown in Table D. All alternatives would increase daily summer Tahoe Basin VMT over the existing condition (1,937,070), ranging between 1,973,780 (Alternative 1) and 1,983,452 (Alternative 4). This represents between a 1.9 percent and a 2.4 percent increase in basin-wide VMT, respectively. Significantly, all of these figures are below the TRPA Air Quality Threshold value of 2,030,938 by at least 47,486. They are also below the VMT estimate for 2035 of 2,131,000 identified in the 2012 *Regional Transportation Plan EIS*.



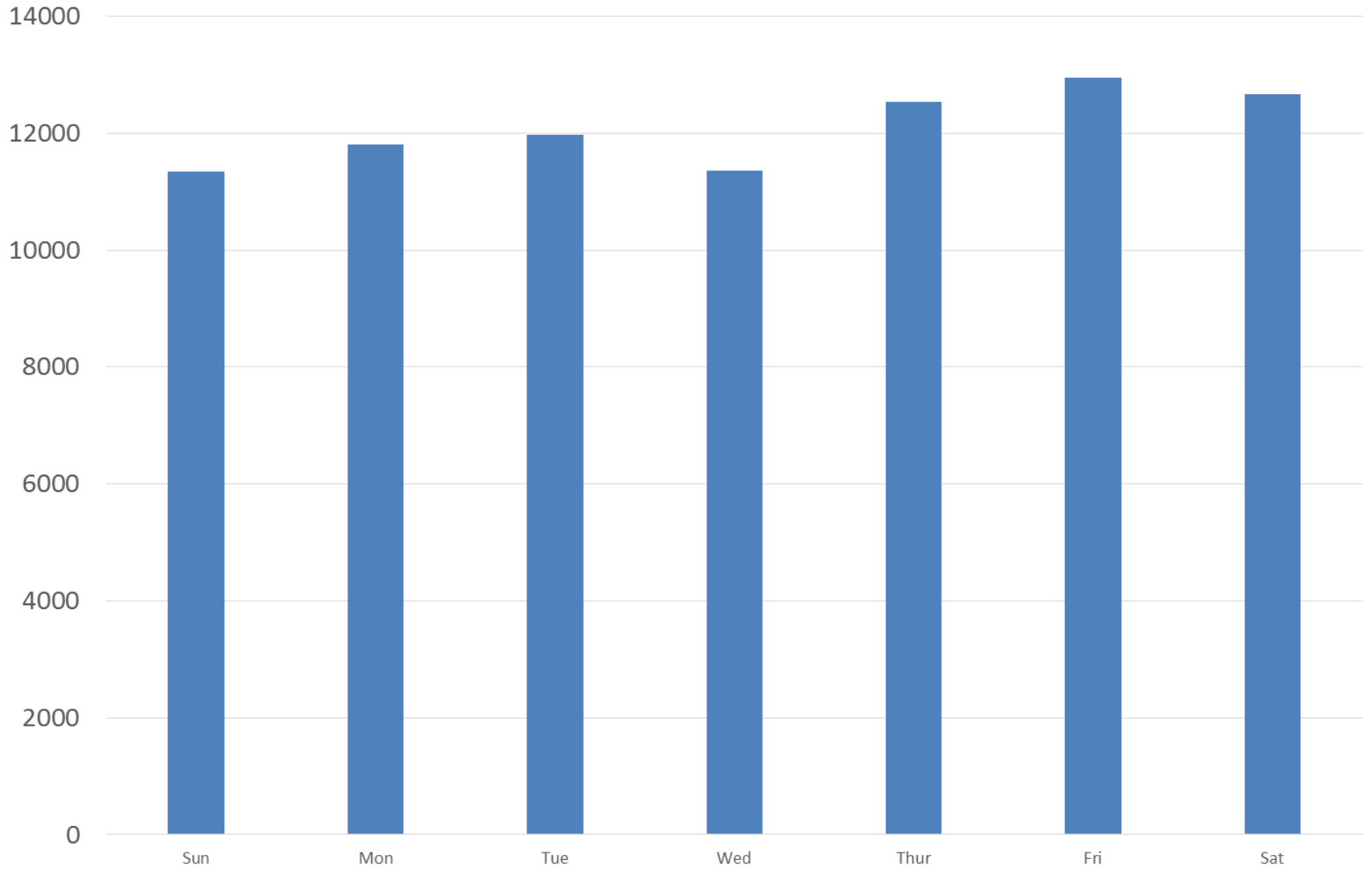
Source: Caltrans 2015, adapted by LSC Transportation Consultants, Inc.

Exhibit 10-2 **10-year Trends in Peak Traffic Volume on SR 28**



Source: Caltrans 2015, adapted by LSC Transportation Consultants, Inc.

Exhibit 10-3 **Variation in Traffic Volume on SR 28 at Top of Dollar Hill Throughout the Summer of 2015**



Source: Caltrans 2015, adapted by LSC Transportation Consultants, Inc.

Exhibit 10-4 Average Variation in Traffic Volume on SR 28 at Top of Dollar Hill throughout a Week in Summer 2015

TABLE D: Regionwide VMT Analysis for Placer Tahoe Basin Area Plan

	Placer Area Plan Alternative			
	Alt One	Alt Two	Alt Three	Alt Four
Existing 2015 Regionwide VMT 1,937,070				
TRPA TransCAD Model -- Unadjusted	1,968,788	1,977,429	1,973,828	1,980,925
Minus TRPA TransCAD VMT on Tahoe City Lodge Site	-6,302	-2,943	-6,302	-13,910
Plus VMT Generated by Tahoe City Lodge Site	8,570	2,943	8,570	13,910
Minus TRIA Adjustment for RTP Mode Shift Policies	-39,421	-39,549	-39,522	-39,619
Plus External VMT Not Fully Reflected in TRPA Model	42,477	42,477	42,477	42,477
Minus TRIA Adjustment for Additional External VMT	-331	-331	-331	-331
Regionwide VMT	1,973,780	1,980,026	1,978,719	1,983,452
Increase Over Existing: #	36,710	42,956	41,649	46,382
Increase Over Existing: %	1.9%	2.2%	2.2%	2.4%
TRPA Compact Threshold	2,030,938	2,030,938	2,030,938	2,030,938
Threshold Minus Alternative Regionwide VMT	57,158	50,912	52,219	47,486
Alternative Attains Compact Threshold?	Yes	Yes	Yes	Yes

TABLE E: Analysis of Tahoe City Lodge VMT

Origins/Destination within the Lake Tahoe Basin	Distribution		Existing Non Pass-by	Land Use in TRPA Model				Lodge Alternative Land Use			
				1	2	3	4	1	2	3	4
Daily 1-Way Vehicle Trips	Lodge	Retail Non-Passby									
South Lake Tahoe	3%	2%	19	25	12	25	44	34	12	34	44
Emerald Bay	4%	1%	9	33	16	33	22	45	16	45	22
Homewood/Tahoma	10%	10%	93	83	39	83	221	113	39	113	221
Sunnyside	8%	9%	84	67	31	67	199	91	31	91	199
Eastern Tahoe City	5%	9%	84	42	19	42	199	57	19	57	199
Dollar Hill/Lake Forest	0%	9%	84	0	0	0	199	0	0	0	199
Carnelian Bay	4%	9%	84	33	16	33	199	45	16	45	199
Tahoe Vista	9%	9%	84	75	35	75	199	102	35	102	199
Kings Beach/ Crystal Bay	16%	12%	112	133	62	133	265	181	62	181	265
Incline Village/East Shore	6%	5%	47	50	23	50	110	68	23	68	110
SR 89 North	35%	25%	233	292	136	292	552	397	136	397	552
Total	100%	100%	**932**	**833**	**389**	**833**	**2,206**	**1,133**	**389**	**1,133**	**2,206**
Daily Vehicle-Miles of Travel	Trip Length (Miles)										
South Lake Tahoe	31.2		582	780	364	780	1,377	1,060	364	1,060	1,377
Emerald Bay	18.8		175	626	293	626	415	852	293	852	415
Homewood/Tahoma	8.6		802	716	335	716	1,897	974	335	974	1,897
Sunnyside	2.4		201	160	75	160	476	218	75	218	476
Eastern Tahoe City	0.4		34	17	8	17	79	23	8	23	79
Dollar Hill/Lake Forest	2.4		201	0	0	0	476	0	0	0	476
Carnelian Bay	5.7		478	190	89	190	1,132	258	89	258	1,132
Tahoe Vista	8.2		688	615	287	615	1,628	836	287	836	1,628
Kings Beach/ Crystal Bay	10.0		1,119	1,333	622	1,333	2,647	1,813	622	1,813	2,647
Incline Village/East Shore	16.3		760	815	380	815	1,798	1,108	380	1,108	1,798
SR 89 North	3.6		839	1,050	490	1,050	1,985	1,428	490	1,428	1,985
Total			**5,879**	**6,302**	**2,943**	**6,302**	**13,910**	**8,570**	**2,943**	**8,570**	**13,910**

TABLE F: Analysis of Additional External Trip VMT Not Reflected in TRPA Model

Origins/Destination within the Lake Tahoe Basin	Distribution of External Trips Internally Within Tahoe Region (1)		SR 267 External Point			SR 89 North External Point									
						Tahoe Model			Squaw Valley/Alpine Mdws Area Projects (3)						
			Tahoe Model Growth	Truckee/ Martis Model Growth	Subtotal: Additional Over Tahoe Model	Total Growth	Portion: Growth in Travel To/From Squaw Valley/Alpine Meadows (2)	Portion: Growth in Travel To/From Truckee and Beyond	Village at Squaw Valley	Plumpjack	Alpine Sierra	Palisades	Total Growth in Travel To/From Squaw Valley/Alpine Meadows	Subtotal: Additional Growth in Travel To/From Squaw Valley/Alpine Meadows Over Tahoe Model	**Total: Both External Corridors**
Daily Vehicle-Trips	SR 267	SR 89 North													
South Lake Tahoe	4%	3%	50	92	42	26	9	18	75	2	3	6	86	77	119
Emerald Bay	5%	4%	63	115	53	41	14	28	118	3	5	5	131	117	170
Homewood	5%	18%	63	115	53	174	58	116	497	13	19	8	537	479	531
Sunny Side	5%	11%	63	115	53	113	38	76	323	8	12	7	351	313	365
Tahoe City	18%	29%	226	415	189	286	95	190	815	21	29	83	949	854	1,043
Carnelian Bay	4%	4%	50	92	42	34	11	23	96	3	2	3	104	93	135
Tahoe Vista	6%	8%	75	138	63	80	27	54	229	6	8	7	250	223	286
Kings Beach/ Crystal Bay	31%	17%	390	716	326	168	56	112	479	13	15	21	528	472	797
Incline Village/East Shore	20%	5%	251	462	210	61	20	40	173	4	6	14	197	176	387
Spooner Summit	2%	0%	25	46	21	0	0	0	0	0	0	0	0	0	21
Total			1,257	2,308	1,051	984	328	656	2,807	73	98	154	3,132	2,804	3,855
Daily Vehicle-Miles of Travel	Tahoe Internal Trip Length by External Point (Mi.)														
	SR 267	SR 89 North													
South Lake Tahoe	35.0	34.5			1,471									2,668	4,139
Emerald Bay	37.2	22.0			1,955									2,576	4,531
Homewood	20.5	12.0			1,077									5,746	6,823
Sunny Side	14.4	5.9			757									1,845	2,602
Tahoe City	12.5	4.0			2,365									3,414	5,779
Carnelian Bay	7.3	9.3			307									863	1,170
Tahoe Vista	4.7	11.9			296									2,655	2,951
Kings Beach/ Crystal Bay	4.6	13.7			1,499									6,461	7,960
Incline Village/East Shore	11.5	20.6			2,417									3,633	6,050
Spooner Summit	22.4	--			471									0	471
Total					12,616									29,861	42,477

Note 1: LSC estimates, based upon summer traffic counts.

Note 2: Based on review of existing summer turning movements on SR 89 at Squaw Valley Road and Alpine Meadows Road, one-third of external traffic growth identified in the TRPA Model is estimated to be growth associated with Squaw Valley / Alpine Meadows and the remaining two-thirst associated with Truckee and beyond.

Note 3: Sources -- Village at Squaw Valley Specific Plan Draft Environmental Impact Report (Ascent Environmental, May 2015), PlumpJack Squaw Valley Inn Expansion Traffic & Parking Impact Analysis (LSC, July 2014), Alpine Sierra Subdivision Traffic Impact Analysis (LSC, April 2015) and Palisades at Squaw Transportation Impact Analysis (LSC, October 2015).

Appendix G-3

LOS Traffic Descriptions

DESCRIPTIONS OF LEVELS OF SERVICE

The concept of level of service is defined as a qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers. A level of service definition generally describes these conditions in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. Six levels of service are defined for each type of facility for which analysis procedures are available. They are given letter designations, from A to F, with level of service A representing the best operating conditions and level of service F the worst.

Level of Service Definitions

In general, the various levels of service are defined as follows for uninterrupted flow facilities:

- **Level of service A** represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to maneuver within the traffic stream is extremely high. The general level of comfort and convenience provided to the motorist, passenger, or pedestrian is excellent.

- **Level of service B** is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver within the traffic stream from LOS A. The level of comfort and convenience provided is somewhat less than at LOS A, because the presence of others in the traffic stream begins to affect individual behavior.

- **Level of service C** is in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream. The selection of speed is now affected by the presence of others, and maneuvering within the traffic stream requires substantial vigilance on the part of the user. The general level of comfort and convenience declines noticeably at this level.

- **Level of Service D** represents high-density, but stable, flow. Speed and freedom to maneuver are severely restricted, and the driver or pedestrian experiences a generally poor level of comfort and convenience. Small increases in traffic flow will generally cause operational problems at this level.

- **Level of service E** represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform value. Freedom to maneuver within the traffic stream is extremely difficult, and it is generally accomplished by forcing a vehicle or pedestrian to “give way” to accommodate such maneuvers. Comfort and convenience levels are extremely poor, and driver or pedestrian frustration is generally high. Operations at this level are usually unstable, because small increases in flow or minor perturbations within the traffic stream will cause breakdowns.

- **Level of service F** is used to define forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount which can traverse the point. Queues form behind such locations. Operations within the queue are characterized by stop-and-go waves, and they are extremely unstable. Vehicles may progress at reasonable speeds for several hundred feet or more, then be required to stop in a cyclic fashion. Level of service F is used to describe the operating conditions within the queue, as well as the point of the breakdown. It should be noted, however, that in many cases operating conditions of vehicles or pedestrians discharged from the queue may be quite good. Nevertheless, it is the point at which arrival flow exceeds discharge flow which causes the queue to form, and level of service F is an appropriate designation for such points.

Appendix G-4

LOS Intersection Output

Existing No Project

HCM 2010 Signalized Intersection Summary
1: SR 89 & SR 28

2/17/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	48	344	417	362	323	21	318	74	304	30	89	13
Number	5	2	12	1	6	16	7	4	14	3	8	18
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		1.00	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	1863	1863	1863	1863	1863	1900	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	51	366	0	385	344	22	208	260	0	32	95	14
Adj No. of Lanes	1	2	1	2	2	0	1	1	1	0	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	74	735	329	458	1010	64	361	380	323	41	122	18
Arrive On Green	0.04	0.21	0.00	0.13	0.30	0.30	0.20	0.20	0.00	0.10	0.10	0.10
Sat Flow, veh/h	1774	3539	1583	3442	3379	215	1774	1863	1583	411	1220	180
Grp Volume(v), veh/h	51	366	0	385	179	187	208	260	0	141	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1721	1770	1825	1774	1863	1583	1810	0	0
Q Serve(g_s), s	1.3	4.1	0.0	4.9	3.6	3.6	4.8	5.8	0.0	3.4	0.0	0.0
Cycle Q Clear(g_c), s	1.3	4.1	0.0	4.9	3.6	3.6	4.8	5.8	0.0	3.4	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.12	1.00		1.00	0.23		0.10
Lane Grp Cap(c), veh/h	74	735	329	458	529	546	361	380	323	182	0	0
V/C Ratio(X)	0.69	0.50	0.00	0.84	0.34	0.34	0.58	0.69	0.00	0.78	0.00	0.00
Avail Cap(c_a), veh/h	236	1256	562	458	628	648	630	661	562	241	0	0
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	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	21.3	15.8	0.0	19.1	12.3	12.3	16.2	16.6	0.0	19.8	0.0	0.0
Incr Delay (d2), s/veh	10.7	0.5	0.0	13.1	0.4	0.4	1.4	2.2	0.0	10.8	0.0	0.0
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(95%),veh/ln	1.5	3.7	0.0	5.6	3.2	3.4	4.4	5.7	0.0	4.0	0.0	0.0
LnGrp Delay(d),s/veh	32.0	16.3	0.0	32.2	12.7	12.7	17.6	18.8	0.0	30.6	0.0	0.0
LnGrp LOS	C	B		C	B	B	B	B		C		
Approach Vol, veh/h		417			751			468			141	
Approach Delay, s/veh		18.2			22.7			18.3			30.6	
Approach LOS		B			C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.0	13.4		13.2	5.9	17.5		8.5
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	6.0	16.0		16.0	6.0	16.0		6.0
Max Q Clear Time (g_c+I1), s	6.9	6.1		7.8	3.3	5.6		5.4
Green Ext Time (p_c), s	0.0	3.2		1.4	0.0	3.4		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	21.1
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	6	699	2	7	611	14	2	0	17	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	-	-	None	-	-	None
Storage Length	50	-	-	50	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	728	2	7	636	15	2	0	18	3	0	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	651	0	0	730	0	0	1404	1408	729	1409	1401	644
Stage 1	-	-	-	-	-	-	742	742	-	658	658	-
Stage 2	-	-	-	-	-	-	662	666	-	751	743	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	935	-	-	874	-	-	117	139	423	116	140	473
Stage 1	-	-	-	-	-	-	408	422	-	453	461	-
Stage 2	-	-	-	-	-	-	451	457	-	403	422	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	935	-	-	874	-	-	114	137	423	110	138	473
Mov Cap-2 Maneuver	-	-	-	-	-	-	243	260	-	237	261	-
Stage 1	-	-	-	-	-	-	405	419	-	450	457	-
Stage 2	-	-	-	-	-	-	440	453	-	384	419	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	14.7	15.2
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	392	935	-	-	874	-	-	364
HCM Lane V/C Ratio	0.05	0.007	-	-	0.008	-	-	0.029
HCM Control Delay (s)	14.7	8.9	-	-	9.2	-	-	15.2
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	12

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	27	752	12	17	598	21	7	0	19	37	0	35
Conflicting Peds, #/hr	28	0	120	120	0	28	153	0	0	0	0	153
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	80	-	-	80	-	-	-	-	-	-	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	28	775	12	18	616	22	7	0	20	38	0	36

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	791	0	0	941	0	0	1823	1816	1054	1815	1811	900
Stage 1	-	-	-	-	-	-	990	990	-	815	815	-
Stage 2	-	-	-	-	-	-	833	826	-	1000	996	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	829	-	-	729	-	-	60	78	275	60	79	337
Stage 1	-	-	-	-	-	-	297	324	-	371	391	-
Stage 2	-	-	-	-	-	-	363	387	-	293	322	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	746	-	-	656	-	-	39	56	216	41	56	265
Mov Cap-2 Maneuver	-	-	-	-	-	-	39	56	-	41	56	-
Stage 1	-	-	-	-	-	-	249	272	-	312	332	-
Stage 2	-	-	-	-	-	-	274	328	-	231	270	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.3	55.7	227.3
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	97	746	-	-	656	-	-	70
HCM Lane V/C Ratio	0.276	0.037	-	-	0.027	-	-	1.06
HCM Control Delay (s)	55.7	10	-	-	10.6	-	-	227.3
HCM Lane LOS	F	B	-	-	B	-	-	F
HCM 95th %tile Q(veh)	1	0.1	-	-	0.1	-	-	5.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	257	662	1	0	539	337	1	1	0	363	2	334
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		1.00	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	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	286	736	1	0	599	374	1	1	0	403	2	371
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	330	2032	3	2	666	416	2	2	0	475	2	426
Arrive On Green	0.19	0.56	0.56	0.00	0.32	0.32	0.00	0.00	0.00	0.27	0.27	0.27
Sat Flow, veh/h	1774	3627	5	1774	2094	1308	909	909	0	1766	9	1583
Grp Volume(v), veh/h	286	359	378	0	506	467	2	0	0	405	0	371
Grp Sat Flow(s),veh/h/ln	1774	1770	1862	1774	1770	1632	1817	0	0	1774	0	1583
Q Serve(g_s), s	11.1	8.0	8.0	0.0	19.5	19.5	0.1	0.0	0.0	15.4	0.0	15.9
Cycle Q Clear(g_c), s	11.1	8.0	8.0	0.0	19.5	19.5	0.1	0.0	0.0	15.4	0.0	15.9
Prop In Lane	1.00		0.00	1.00		0.80	0.50		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	330	992	1043	2	563	519	4	0	0	477	0	426
V/C Ratio(X)	0.87	0.36	0.36	0.00	0.90	0.90	0.51	0.00	0.00	0.85	0.00	0.87
Avail Cap(c_a), veh/h	373	992	1043	100	596	549	102	0	0	523	0	466
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	0.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.1	8.6	8.6	0.0	23.2	23.2	35.5	0.0	0.0	24.7	0.0	24.9
Incr Delay (d2), s/veh	17.3	0.2	0.2	0.0	16.1	17.2	75.0	0.0	0.0	11.6	0.0	15.3
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(95%),veh/ln	11.4	7.1	7.5	0.0	17.6	16.6	0.2	0.0	0.0	14.0	0.0	13.6
LnGrp Delay(d),s/veh	45.4	8.9	8.9	0.0	39.3	40.4	110.5	0.0	0.0	36.3	0.0	40.2
LnGrp LOS	D	A	A		D	D	F			D		D
Approach Vol, veh/h		1023			973			2			776	
Approach Delay, s/veh		19.1			39.8			110.5			38.2	
Approach LOS		B			D			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	0.0	43.9		23.2	17.3	26.7		4.2
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	4.0	35.0		21.0	15.0	24.0		4.0
Max Q Clear Time (g_c+I1), s	0.0	10.0		17.9	13.1	21.5		2.1
Green Ext Time (p_c), s	0.0	13.1		1.2	0.2	1.2		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	31.8
HCM 2010 LOS	C

Intersection	
Intersection Delay, s/veh	9.9
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	706	703	54	109
Demand Flow Rate, veh/h	720	716	55	112
Vehicles Circulating, veh/h	44	77	723	727
Vehicles Exiting, veh/h	795	701	41	66
Follow-Up Headway, s	2.800	2.800	2.800	2.800
Ped Vol Crossing Leg, #/h	100	90	17	62
Ped Cap Adj	0.986	0.988	0.998	0.992
Approach Delay, s/veh	10.1	10.5	5.8	6.8
Approach LOS	B	B	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	4.200	4.200	4.200	4.200
Entry Flow, veh/h	720	716	55	112
Cap Entry Lane, veh/h	1242	1211	733	730
Entry HV Adj Factor	0.981	0.981	0.981	0.973
Flow Entry, veh/h	706	703	54	109
Cap Entry, veh/h	1202	1174	717	705
V/C Ratio	0.588	0.599	0.075	0.155
Control Delay, s/veh	10.1	10.5	5.8	6.8
LOS	B	B	A	A
95th %tile Queue, veh	4	4	0	1

Intersection	
Intersection Delay, s/veh	12.7
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	841	712	25	195
Demand Flow Rate, veh/h	858	726	25	199
Vehicles Circulating, veh/h	107	67	922	702
Vehicles Exiting, veh/h	794	880	43	91
Follow-Up Headway, s	2.800	2.800	2.800	2.800
Ped Vol Crossing Leg, #/h	132	99	46	55
Ped Cap Adj	0.970	0.986	1.000	0.992
Approach Delay, s/veh	15.8	10.6	6.2	8.1
Approach LOS	C	B	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	4.200	4.200	4.200	4.200
Entry Flow, veh/h	858	726	25	199
Cap Entry Lane, veh/h	1183	1220	628	745
Entry HV Adj Factor	0.981	0.980	0.996	0.979
Flow Entry, veh/h	841	712	25	195
Cap Entry, veh/h	1125	1180	625	723
V/C Ratio	0.748	0.603	0.040	0.269
Control Delay, s/veh	15.8	10.6	6.2	8.1
LOS	C	B	A	A
95th %tile Queue, veh	7	4	0	1

Existing + Alternative 1

Intersection	
Intersection Delay, s/veh	14.6
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	719	774	314	140
Demand Flow Rate, veh/h	734	789	321	143
Vehicles Circulating, veh/h	316	224	690	864
Vehicles Exiting, veh/h	691	787	360	149
Follow-Up Headway, s	2.800	2.800	2.800	2.800
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	16.5	15.7	10.6	8.2
Approach LOS	C	C	B	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	4.200	4.200	4.200	4.200
Entry Flow, veh/h	734	789	321	143
Cap Entry Lane, veh/h	1006	1080	752	657
Entry HV Adj Factor	0.979	0.980	0.979	0.980
Flow Entry, veh/h	719	774	314	140
Cap Entry, veh/h	985	1059	736	643
V/C Ratio	0.730	0.730	0.427	0.218
Control Delay, s/veh	16.5	15.7	10.6	8.2
LOS	C	C	B	A
95th %tile Queue, veh	7	7	2	1

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	722	3	9	650	2	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	752	3	9	677	2	19

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	755	0	1450	754
Stage 1	-	-	-	-	754	-
Stage 2	-	-	-	-	696	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	855	-	144	409
Stage 1	-	-	-	-	465	-
Stage 2	-	-	-	-	495	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	855	-	142	409
Mov Cap-2 Maneuver	-	-	-	-	347	-
Stage 1	-	-	-	-	465	-
Stage 2	-	-	-	-	490	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	14.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	402	-	-	855	-
HCM Lane V/C Ratio	0.052	-	-	0.011	-
HCM Control Delay (s)	14.4	-	-	9.3	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	25.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	37	719	12	17	603	29	7	0	19	51	0	48
Conflicting Peds, #/hr	28	0	120	120	0	28	153	0	0	0	0	153
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	80	-	-	80	-	-	-	-	-	-	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	38	741	12	18	622	30	7	0	20	53	0	49

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	805	0	0	907	0	0	1826	1817	1020	1812	1808	910
Stage 1	-	-	-	-	-	-	977	977	-	825	825	-
Stage 2	-	-	-	-	-	-	849	840	-	987	983	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	819	-	-	750	-	-	59	78	287	61	79	333
Stage 1	-	-	-	-	-	-	302	329	-	367	387	-
Stage 2	-	-	-	-	-	-	356	381	-	298	327	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	737	-	-	675	-	-	35	55	225	~ 41	56	261
Mov Cap-2 Maneuver	-	-	-	-	-	-	35	55	-	~ 41	56	-
Stage 1	-	-	-	-	-	-	250	272	-	304	329	-
Stage 2	-	-	-	-	-	-	253	324	-	232	271	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.3	60.3	$ 380.3
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	91	737	-	-	675	-	-	69
HCM Lane V/C Ratio	0.295	0.052	-	-	0.026	-	-	1.479
HCM Control Delay (s)	60.3	10.2	-	-	10.5	-	-	$ 380.3
HCM Lane LOS	F	B	-	-	B	-	-	F
HCM 95th %tile Q(veh)	1.1	0.2	-	-	0.1	-	-	8.6

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	279	666	1	0	562	323	1	1	0	367	2	386
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		1.00	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	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	310	740	1	0	624	359	1	1	0	408	2	429
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	349	2037	3	2	669	385	2	2	0	472	2	423
Arrive On Green	0.20	0.56	0.56	0.00	0.31	0.31	0.00	0.00	0.00	0.27	0.27	0.27
Sat Flow, veh/h	1774	3627	5	1774	2166	1246	909	909	0	1766	9	1583
Grp Volume(v), veh/h	310	361	380	0	510	473	2	0	0	410	0	429
Grp Sat Flow(s),veh/h/ln	1774	1770	1862	1774	1770	1643	1817	0	0	1774	0	1583
Q Serve(g_s), s	12.1	8.0	8.0	0.0	19.9	19.9	0.1	0.0	0.0	15.7	0.0	19.0
Cycle Q Clear(g_c), s	12.1	8.0	8.0	0.0	19.9	19.9	0.1	0.0	0.0	15.7	0.0	19.0
Prop In Lane	1.00		0.00	1.00		0.76	0.50		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	349	994	1046	2	546	507	4	0	0	474	0	423
V/C Ratio(X)	0.89	0.36	0.36	0.00	0.93	0.93	0.51	0.00	0.00	0.86	0.00	1.01
Avail Cap(c_a), veh/h	349	994	1046	100	548	508	102	0	0	474	0	423
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	0.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.8	8.6	8.6	0.0	23.9	23.9	35.4	0.0	0.0	24.8	0.0	26.0
Incr Delay (d2), s/veh	23.0	0.2	0.2	0.0	23.2	24.4	75.0	0.0	0.0	15.3	0.0	47.3
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(95%),veh/ln	12.8	7.0	7.3	0.0	19.1	18.1	0.2	0.0	0.0	14.7	0.0	24.8
LnGrp Delay(d),s/veh	50.8	8.8	8.8	0.0	47.1	48.3	110.4	0.0	0.0	40.1	0.0	73.4
LnGrp LOS	D	A	A		D	D	F			D		F
Approach Vol, veh/h		1051			983			2			839	
Approach Delay, s/veh		21.2			47.7			110.4			57.1	
Approach LOS		C			D			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	0.0	43.9		23.0	18.0	25.9		4.2
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	4.0	32.0		19.0	14.0	22.0		4.0
Max Q Clear Time (g_c+I1), s	0.0	10.0		21.0	14.1	21.9		2.1
Green Ext Time (p_c), s	0.0	12.3		0.0	0.0	0.1		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		40.8
HCM 2010 LOS		D

Intersection	
Intersection Delay, s/veh	14.6
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	719	774	314	140
Demand Flow Rate, veh/h	734	789	321	143
Vehicles Circulating, veh/h	316	224	690	864
Vehicles Exiting, veh/h	691	787	360	149
Follow-Up Headway, s	2.800	2.800	2.800	2.800
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	16.5	15.7	10.6	8.2
Approach LOS	C	C	B	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	4.200	4.200	4.200	4.200
Entry Flow, veh/h	734	789	321	143
Cap Entry Lane, veh/h	1006	1080	752	657
Entry HV Adj Factor	0.979	0.980	0.979	0.980
Flow Entry, veh/h	719	774	314	140
Cap Entry, veh/h	985	1059	736	643
V/C Ratio	0.730	0.730	0.427	0.218
Control Delay, s/veh	16.5	15.7	10.6	8.2
LOS	C	C	B	A
95th %tile Queue, veh	7	7	2	1

Intersection	
Intersection Delay, s/veh	10.8
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	735	716	56	180
Demand Flow Rate, veh/h	750	730	57	184
Vehicles Circulating, veh/h	73	113	770	743
Vehicles Exiting, veh/h	854	714	53	100
Follow-Up Headway, s	2.800	2.800	2.800	2.800
Ped Vol Crossing Leg, #/h	100	90	17	62
Ped Cap Adj	0.986	0.988	0.998	0.992
Approach Delay, s/veh	11.2	11.5	6.1	8.2
Approach LOS	B	B	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	4.200	4.200	4.200	4.200
Entry Flow, veh/h	750	730	57	184
Cap Entry Lane, veh/h	1215	1178	706	721
Entry HV Adj Factor	0.980	0.980	0.982	0.978
Flow Entry, veh/h	735	716	56	180
Cap Entry, veh/h	1175	1140	692	700
V/C Ratio	0.626	0.628	0.081	0.257
Control Delay, s/veh	11.2	11.5	6.1	8.2
LOS	B	B	A	A
95th %tile Queue, veh	5	5	0	1

Intersection	
Intersection Delay, s/veh	15.1
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	870	704	25	314
Demand Flow Rate, veh/h	888	719	25	320
Vehicles Circulating, veh/h	172	102	982	695
Vehicles Exiting, veh/h	843	905	78	126
Follow-Up Headway, s	2.800	2.800	2.800	2.800
Ped Vol Crossing Leg, #/h	132	99	46	55
Ped Cap Adj	0.971	0.986	1.000	0.992
Approach Delay, s/veh	20.2	11.1	6.5	10.8
Approach LOS	C	B	A	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	4.200	4.200	4.200	4.200
Entry Flow, veh/h	888	719	25	320
Cap Entry Lane, veh/h	1125	1188	599	749
Entry HV Adj Factor	0.980	0.979	0.996	0.981
Flow Entry, veh/h	870	704	25	314
Cap Entry, veh/h	1070	1147	597	729
V/C Ratio	0.813	0.614	0.042	0.431
Control Delay, s/veh	20.2	11.1	6.5	10.8
LOS	C	B	A	B
95th %tile Queue, veh	9	4	0	2

Existing + Alternative 2

Intersection	
Intersection Delay, s/veh	13.9
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	680	771	304	140
Demand Flow Rate, veh/h	694	787	310	143
Vehicles Circulating, veh/h	319	225	649	863
Vehicles Exiting, veh/h	687	734	364	149
Follow-Up Headway, s	2.800	2.800	2.800	2.800
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	14.9	15.6	9.8	8.2
Approach LOS	B	C	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	4.200	4.200	4.200	4.200
Entry Flow, veh/h	694	787	310	143
Cap Entry Lane, veh/h	1003	1079	776	657
Entry HV Adj Factor	0.979	0.979	0.982	0.980
Flow Entry, veh/h	680	771	304	140
Cap Entry, veh/h	983	1057	762	644
V/C Ratio	0.692	0.729	0.399	0.218
Control Delay, s/veh	14.9	15.6	9.8	8.2
LOS	B	C	A	A
95th %tile Queue, veh	6	7	2	1

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	712	3	11	622	2	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	742	3	11	648	2	19

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	745	0	1414	743
Stage 1	-	-	-	-	743	-
Stage 2	-	-	-	-	671	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	863	-	152	415
Stage 1	-	-	-	-	470	-
Stage 2	-	-	-	-	508	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	863	-	150	415
Mov Cap-2 Maneuver	-	-	-	-	354	-
Stage 1	-	-	-	-	470	-
Stage 2	-	-	-	-	502	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	14.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	408	-	-	863	-
HCM Lane V/C Ratio	0.051	-	-	0.013	-
HCM Control Delay (s)	14.3	-	-	9.2	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	32.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	44	716	12	17	570	34	7	0	19	57	0	54
Conflicting Peds, #/hr	28	0	120	120	0	28	153	0	0	0	0	153
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	80	-	-	80	-	-	-	-	-	-	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	45	738	12	18	588	35	7	0	20	59	0	56

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	776	0	0	904	0	0	1809	1799	1017	1791	1787	878
Stage 1	-	-	-	-	-	-	988	988	-	793	793	-
Stage 2	-	-	-	-	-	-	821	811	-	998	994	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	840	-	-	752	-	-	61	80	288	63	81	347
Stage 1	-	-	-	-	-	-	297	325	-	382	400	-
Stage 2	-	-	-	-	-	-	369	393	-	294	323	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	756	-	-	677	-	-	36	56	226	~ 42	56	272
Mov Cap-2 Maneuver	-	-	-	-	-	-	36	56	-	~ 42	56	-
Stage 1	-	-	-	-	-	-	244	267	-	313	340	-
Stage 2	-	-	-	-	-	-	257	334	-	227	265	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	0.3	58.7	$ 429.4
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	93	756	-	-	677	-	-	71
HCM Lane V/C Ratio	0.288	0.06	-	-	0.026	-	-	1.612
HCM Control Delay (s)	58.7	10.1	-	-	10.5	-	-	$ 429.4
HCM Lane LOS	F	B	-	-	B	-	-	F
HCM 95th %tile Q(veh)	1.1	0.2	-	-	0.1	-	-	9.8

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	295	664	1	0	553	315	1	1	0	359	2	414
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		1.00	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	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	328	738	1	0	614	350	1	1	0	399	2	460
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	370	2058	3	2	663	378	2	2	0	475	2	426
Arrive On Green	0.21	0.57	0.57	0.00	0.30	0.30	0.00	0.00	0.00	0.27	0.27	0.27
Sat Flow, veh/h	1774	3627	5	1774	2174	1239	909	909	0	1766	9	1583
Grp Volume(v), veh/h	328	360	379	0	500	464	2	0	0	401	0	460
Grp Sat Flow(s),veh/h/ln	1774	1770	1862	1774	1770	1644	1817	0	0	1774	0	1583
Q Serve(g_s), s	13.3	8.2	8.2	0.0	20.3	20.3	0.1	0.0	0.0	15.9	0.0	20.0
Cycle Q Clear(g_c), s	13.3	8.2	8.2	0.0	20.3	20.3	0.1	0.0	0.0	15.9	0.0	20.0
Prop In Lane	1.00		0.00	1.00		0.75	0.50		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	370	1004	1056	2	539	501	4	0	0	477	0	426
V/C Ratio(X)	0.89	0.36	0.36	0.00	0.93	0.93	0.51	0.00	0.00	0.84	0.00	1.08
Avail Cap(c_a), veh/h	406	1004	1056	95	548	509	98	0	0	477	0	426
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	0.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.6	8.7	8.7	0.0	25.0	25.0	37.0	0.0	0.0	25.7	0.0	27.2
Incr Delay (d2), s/veh	19.2	0.2	0.2	0.0	21.8	23.0	75.1	0.0	0.0	12.6	0.0	66.7
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(95%),veh/ln	13.3	7.3	7.7	0.0	19.1	18.1	0.2	0.0	0.0	14.4	0.0	29.8
LnGrp Delay(d),s/veh	47.8	9.0	8.9	0.0	46.9	48.0	112.2	0.0	0.0	38.3	0.0	93.9
LnGrp LOS	D	A	A		D	D	F			D		F
Approach Vol, veh/h		1067			964			2			861	
Approach Delay, s/veh		20.9			47.4			112.2			68.0	
Approach LOS		C			D			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	0.0	46.2		24.0	19.5	26.7		4.2
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	4.0	36.0		20.0	17.0	23.0		4.0
Max Q Clear Time (g_c+I1), s	0.0	10.2		22.0	15.3	22.3		2.1
Green Ext Time (p_c), s	0.0	13.2		0.0	0.2	0.3		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	43.8
HCM 2010 LOS	D

Intersection	
Intersection Delay, s/veh	10.7
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	730	704	56	182
Demand Flow Rate, veh/h	745	718	57	186
Vehicles Circulating, veh/h	75	113	766	731
Vehicles Exiting, veh/h	842	710	54	100
Follow-Up Headway, s	2.800	2.800	2.800	2.800
Ped Vol Crossing Leg, #/h	100	90	17	62
Ped Cap Adj	0.986	0.988	0.998	0.992
Approach Delay, s/veh	11.1	11.2	6.0	8.1
Approach LOS	B	B	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	4.200	4.200	4.200	4.200
Entry Flow, veh/h	745	718	57	186
Cap Entry Lane, veh/h	1213	1178	709	728
Entry HV Adj Factor	0.980	0.980	0.982	0.978
Flow Entry, veh/h	730	704	56	182
Cap Entry, veh/h	1173	1140	694	706
V/C Ratio	0.623	0.617	0.081	0.258
Control Delay, s/veh	11.1	11.2	6.0	8.1
LOS	B	B	A	A
95th %tile Queue, veh	5	4	0	1

Intersection	
Intersection Delay, s/veh	15.3
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	872	708	26	317
Demand Flow Rate, veh/h	890	723	26	324
Vehicles Circulating, veh/h	174	104	986	700
Vehicles Exiting, veh/h	850	908	78	127
Follow-Up Headway, s	2.800	2.800	2.800	2.800
Ped Vol Crossing Leg, #/h	132	99	46	55
Ped Cap Adj	0.971	0.986	1.000	0.992
Approach Delay, s/veh	20.4	11.2	6.5	11.0
Approach LOS	C	B	A	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	4.200	4.200	4.200	4.200
Entry Flow, veh/h	890	723	26	324
Cap Entry Lane, veh/h	1123	1186	597	746
Entry HV Adj Factor	0.980	0.979	0.996	0.978
Flow Entry, veh/h	872	708	26	317
Cap Entry, veh/h	1068	1146	595	724
V/C Ratio	0.816	0.618	0.044	0.438
Control Delay, s/veh	20.4	11.2	6.5	11.0
LOS	C	B	A	B
95th %tile Queue, veh	10	4	0	2

Existing + Alternative 3

Intersection	
Intersection Delay, s/veh	15.5
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	731	797	320	140
Demand Flow Rate, veh/h	746	814	327	143
Vehicles Circulating, veh/h	327	221	705	886
Vehicles Exiting, veh/h	702	811	368	149
Follow-Up Headway, s	2.800	2.800	2.800	2.800
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	17.5	16.6	11.0	8.4
Approach LOS	C	C	B	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	4.200	4.200	4.200	4.200
Entry Flow, veh/h	746	814	327	143
Cap Entry Lane, veh/h	997	1083	743	645
Entry HV Adj Factor	0.979	0.979	0.979	0.980
Flow Entry, veh/h	731	797	320	140
Cap Entry, veh/h	976	1060	728	632
V/C Ratio	0.748	0.752	0.440	0.222
Control Delay, s/veh	17.5	16.6	11.0	8.4
LOS	C	C	B	A
95th %tile Queue, veh	7	7	2	1

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	744	3	10	668	2	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	775	3	10	696	2	19

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	778	0	1494	777
Stage 1	-	-	-	-	777	-
Stage 2	-	-	-	-	717	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	839	-	136	397
Stage 1	-	-	-	-	453	-
Stage 2	-	-	-	-	484	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	839	-	134	397
Mov Cap-2 Maneuver	-	-	-	-	337	-
Stage 1	-	-	-	-	453	-
Stage 2	-	-	-	-	478	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	14.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	390	-	-	839	-
HCM Lane V/C Ratio	0.053	-	-	0.012	-
HCM Control Delay (s)	14.8	-	-	9.3	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	39.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	42	733	12	17	603	33	7	0	19	60	0	57
Conflicting Peds, #/hr	28	0	120	120	0	28	153	0	0	0	0	153
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	80	-	-	80	-	-	-	-	-	-	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	43	756	12	18	622	34	7	0	20	62	0	59

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	809	0	0	921	0	0	1857	1845	1035	1838	1835	912
Stage 1	-	-	-	-	-	-	1001	1001	-	827	827	-
Stage 2	-	-	-	-	-	-	856	844	-	1011	1008	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	817	-	-	741	-	-	56	75	282	~ 58	76	332
Stage 1	-	-	-	-	-	-	293	321	-	366	386	-
Stage 2	-	-	-	-	-	-	352	379	-	289	318	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	735	-	-	667	-	-	32	52	221	~ 39	53	261
Mov Cap-2 Maneuver	-	-	-	-	-	-	32	52	-	~ 39	53	-
Stage 1	-	-	-	-	-	-	241	264	-	301	328	-
Stage 2	-	-	-	-	-	-	239	322	-	223	261	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.3	65.8	$ 514.4
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	85	735	-	-	667	-	-	67
HCM Lane V/C Ratio	0.315	0.059	-	-	0.026	-	-	1.8
HCM Control Delay (s)	65.8	10.2	-	-	10.5	-	-	$ 514.4
HCM Lane LOS	F	B	-	-	B	-	-	F
HCM 95th %tile Q(veh)	1.2	0.2	-	-	0.1	-	-	10.9

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	295	670	1	0	561	327	1	1	0	368	2	403
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		1.00	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	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	328	744	1	0	623	363	1	1	0	409	2	448
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	367	2077	3	2	673	392	2	2	0	469	2	421
Arrive On Green	0.21	0.57	0.57	0.00	0.31	0.31	0.00	0.00	0.00	0.27	0.27	0.27
Sat Flow, veh/h	1774	3627	5	1774	2155	1256	909	909	0	1766	9	1583
Grp Volume(v), veh/h	328	363	382	0	512	474	2	0	0	411	0	448
Grp Sat Flow(s),veh/h/ln	1774	1770	1862	1774	1770	1641	1817	0	0	1774	0	1583
Q Serve(g_s), s	13.5	8.3	8.3	0.0	21.0	21.0	0.1	0.0	0.0	16.7	0.0	20.0
Cycle Q Clear(g_c), s	13.5	8.3	8.3	0.0	21.0	21.0	0.1	0.0	0.0	16.7	0.0	20.0
Prop In Lane	1.00		0.00	1.00		0.77	0.50		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	367	1013	1066	2	553	513	4	0	0	472	0	421
V/C Ratio(X)	0.89	0.36	0.36	0.00	0.93	0.93	0.51	0.00	0.00	0.87	0.00	1.06
Avail Cap(c_a), veh/h	377	1013	1066	94	564	523	97	0	0	472	0	421
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	0.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.0	8.6	8.6	0.0	25.0	25.0	37.5	0.0	0.0	26.4	0.0	27.6
Incr Delay (d2), s/veh	22.3	0.2	0.2	0.0	21.1	22.3	75.2	0.0	0.0	16.2	0.0	62.1
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(95%),veh/ln	13.8	7.4	7.7	0.0	19.5	18.5	0.2	0.0	0.0	15.5	0.0	28.7
LnGrp Delay(d),s/veh	51.3	8.9	8.9	0.0	46.1	47.3	112.7	0.0	0.0	42.6	0.0	89.7
LnGrp LOS	D	A	A		D	D	F			D		F
Approach Vol, veh/h		1073			986			2			859	
Approach Delay, s/veh		21.8			46.7			112.7			67.2	
Approach LOS		C			D			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	0.0	47.1		24.0	19.6	27.5		4.2
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	4.0	36.0		20.0	16.0	24.0		4.0
Max Q Clear Time (g_c+I1), s	0.0	10.3		22.0	15.5	23.0		2.1
Green Ext Time (p_c), s	0.0	13.5		0.0	0.1	0.5		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		43.6
HCM 2010 LOS		D

Intersection	
Intersection Delay, s/veh	10.6
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	729	714	56	162
Demand Flow Rate, veh/h	743	728	57	165
Vehicles Circulating, veh/h	67	105	759	741
Vehicles Exiting, veh/h	839	711	51	92
Follow-Up Headway, s	2.800	2.800	2.800	2.800
Ped Vol Crossing Leg, #/h	100	90	17	62
Ped Cap Adj	0.986	0.988	0.998	0.992
Approach Delay, s/veh	10.9	11.3	6.0	7.8
Approach LOS	B	B	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	4.200	4.200	4.200	4.200
Entry Flow, veh/h	743	728	57	165
Cap Entry Lane, veh/h	1220	1185	712	723
Entry HV Adj Factor	0.982	0.980	0.982	0.982
Flow Entry, veh/h	729	714	56	162
Cap Entry, veh/h	1182	1147	698	703
V/C Ratio	0.617	0.622	0.080	0.230
Control Delay, s/veh	10.9	11.3	6.0	7.8
LOS	B	B	A	A
95th %tile Queue, veh	4	5	0	1

Intersection	
Intersection Delay, s/veh	13.4
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	835	678	25	283
Demand Flow Rate, veh/h	852	692	25	288
Vehicles Circulating, veh/h	155	94	938	668
Vehicles Exiting, veh/h	801	869	69	118
Follow-Up Headway, s	2.800	2.800	2.800	2.800
Ped Vol Crossing Leg, #/h	132	99	46	55
Ped Cap Adj	0.970	0.986	1.000	0.992
Approach Delay, s/veh	17.3	10.4	6.3	9.7
Approach LOS	C	B	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	4.200	4.200	4.200	4.200
Entry Flow, veh/h	852	692	25	288
Cap Entry Lane, veh/h	1140	1195	620	765
Entry HV Adj Factor	0.980	0.979	0.996	0.982
Flow Entry, veh/h	835	678	25	283
Cap Entry, veh/h	1084	1155	617	745
V/C Ratio	0.770	0.587	0.040	0.379
Control Delay, s/veh	17.3	10.4	6.3	9.7
LOS	C	B	A	A
95th %tile Queue, veh	8	4	0	2

Existing + Alternative 4

Intersection	
Intersection Delay, s/veh	14.9
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	699	805	314	140
Demand Flow Rate, veh/h	713	822	321	143
Vehicles Circulating, veh/h	330	217	680	890
Vehicles Exiting, veh/h	703	784	363	149
Follow-Up Headway, s	2.800	2.800	2.800	2.800
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	16.0	16.8	10.5	8.4
Approach LOS	C	C	B	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	4.200	4.200	4.200	4.200
Entry Flow, veh/h	713	822	321	143
Cap Entry Lane, veh/h	995	1086	758	643
Entry HV Adj Factor	0.981	0.980	0.979	0.980
Flow Entry, veh/h	699	805	314	140
Cap Entry, veh/h	975	1064	742	630
V/C Ratio	0.717	0.757	0.424	0.222
Control Delay, s/veh	16.0	16.8	10.5	8.4
LOS	C	C	B	A
95th %tile Queue, veh	6	8	2	1

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	16	759	3	10	653	38	2	0	18	17	0	19
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	-	-	None	-	-	None
Storage Length	50	-	-	50	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	791	3	10	680	40	2	0	19	18	0	20

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	720	0	0	794	0	0	1557	1567	792	1556	1548	700
Stage 1	-	-	-	-	-	-	826	826	-	721	721	-
Stage 2	-	-	-	-	-	-	731	741	-	835	827	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	882	-	-	827	-	-	92	111	389	92	114	439
Stage 1	-	-	-	-	-	-	366	387	-	419	432	-
Stage 2	-	-	-	-	-	-	413	423	-	362	386	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	882	-	-	827	-	-	86	108	389	85	110	439
Mov Cap-2 Maneuver	-	-	-	-	-	-	259	281	-	205	231	-
Stage 1	-	-	-	-	-	-	359	380	-	411	427	-
Stage 2	-	-	-	-	-	-	390	418	-	338	379	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.1	15.3	19.5
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	370	882	-	-	827	-	-	285
HCM Lane V/C Ratio	0.056	0.019	-	-	0.013	-	-	0.132
HCM Control Delay (s)	15.3	9.2	-	-	9.4	-	-	19.5
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-	-	0.4

Intersection	
Int Delay, s/veh	24.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	36	735	12	17	583	28	7	0	19	50	0	47
Conflicting Peds, #/hr	28	0	120	120	0	28	153	0	0	0	0	153
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	80	-	-	80	-	-	-	-	-	-	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	37	758	12	18	601	29	7	0	20	52	0	48

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	783	0	0	923	0	0	1819	1809	1037	1805	1801	888
Stage 1	-	-	-	-	-	-	991	991	-	804	804	-
Stage 2	-	-	-	-	-	-	828	818	-	1001	997	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	835	-	-	740	-	-	60	79	281	61	80	343
Stage 1	-	-	-	-	-	-	296	324	-	377	396	-
Stage 2	-	-	-	-	-	-	365	390	-	293	322	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	752	-	-	666	-	-	36	56	221	~ 41	56	269
Mov Cap-2 Maneuver	-	-	-	-	-	-	36	56	-	~ 41	56	-
Stage 1	-	-	-	-	-	-	246	269	-	313	336	-
Stage 2	-	-	-	-	-	-	262	331	-	229	267	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.3	58.7	$ 358.7
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	93	752	-	-	666	-	-	70
HCM Lane V/C Ratio	0.288	0.049	-	-	0.026	-	-	1.429
HCM Control Delay (s)	58.7	10	-	-	10.6	-	-	$ 358.7
HCM Lane LOS	F	B	-	-	B	-	-	F
HCM 95th %tile Q(veh)	1.1	0.2	-	-	0.1	-	-	8.3

Notes

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

HCM 2010 Signalized Intersection Summary
4: SR 28 & SR 267

2/5/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	287	671	1	0	556	320	1	1	0	367	2	406
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		1.00	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	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	319	746	1	0	618	356	1	1	0	408	2	451
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	359	2031	3	2	660	380	2	2	0	492	2	441
Arrive On Green	0.20	0.56	0.56	0.00	0.30	0.30	0.00	0.00	0.00	0.28	0.28	0.28
Sat Flow, veh/h	1774	3627	5	1774	2165	1247	909	909	0	1766	9	1583
Grp Volume(v), veh/h	319	364	383	0	505	469	2	0	0	410	0	451
Grp Sat Flow(s),veh/h/ln	1774	1770	1862	1774	1770	1643	1817	0	0	1774	0	1583
Q Serve(g_s), s	13.2	8.6	8.6	0.0	20.9	20.9	0.1	0.0	0.0	16.3	0.0	21.0
Cycle Q Clear(g_c), s	13.2	8.6	8.6	0.0	20.9	20.9	0.1	0.0	0.0	16.3	0.0	21.0
Prop In Lane	1.00		0.00	1.00		0.76	0.50		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	359	991	1043	2	539	500	4	0	0	494	0	441
V/C Ratio(X)	0.89	0.37	0.37	0.00	0.94	0.94	0.51	0.00	0.00	0.83	0.00	1.02
Avail Cap(c_a), veh/h	376	991	1043	94	540	501	96	0	0	494	0	441
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	0.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.2	9.2	9.2	0.0	25.5	25.5	37.6	0.0	0.0	25.5	0.0	27.2
Incr Delay (d2), s/veh	21.3	0.2	0.2	0.0	24.1	25.4	75.2	0.0	0.0	11.3	0.0	48.7
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(95%),veh/ln	13.4	7.6	7.9	0.0	20.0	19.0	0.2	0.0	0.0	14.6	0.0	27.1
LnGrp Delay(d),s/veh	50.6	9.4	9.4	0.0	49.6	50.9	112.8	0.0	0.0	36.8	0.0	75.9
LnGrp LOS	D	A	A		D	D	F			D		F
Approach Vol, veh/h		1066			974			2			861	
Approach Delay, s/veh		21.7			50.2			112.7			57.3	
Approach LOS		C			D			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	0.0	46.2		25.0	19.3	27.0		4.2
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	4.0	35.0		21.0	16.0	23.0		4.0
Max Q Clear Time (g_c+I1), s	0.0	10.6		23.0	15.2	22.9		2.1
Green Ext Time (p_c), s	0.0	13.0		0.0	0.1	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	41.9
HCM 2010 LOS	D

Intersection	
Intersection Delay, s/veh	10.7
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	735	706	54	184
Demand Flow Rate, veh/h	750	720	55	188
Vehicles Circulating, veh/h	74	111	771	731
Vehicles Exiting, veh/h	845	715	53	100
Follow-Up Headway, s	2.800	2.800	2.800	2.800
Ped Vol Crossing Leg, #/h	100	90	17	62
Ped Cap Adj	0.986	0.988	0.998	0.992
Approach Delay, s/veh	11.2	11.2	6.0	8.2
Approach LOS	B	B	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	4.200	4.200	4.200	4.200
Entry Flow, veh/h	750	720	55	188
Cap Entry Lane, veh/h	1214	1179	706	728
Entry HV Adj Factor	0.980	0.980	0.981	0.979
Flow Entry, veh/h	735	706	54	184
Cap Entry, veh/h	1174	1142	691	707
V/C Ratio	0.626	0.618	0.078	0.260
Control Delay, s/veh	11.2	11.2	6.0	8.2
LOS	B	B	A	A
95th %tile Queue, veh	5	4	0	1

Intersection	
Intersection Delay, s/veh	15.4
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	877	705	25	321
Demand Flow Rate, veh/h	895	720	25	328
Vehicles Circulating, veh/h	175	102	992	696
Vehicles Exiting, veh/h	849	915	78	126
Follow-Up Headway, s	2.800	2.800	2.800	2.800
Ped Vol Crossing Leg, #/h	132	99	46	55
Ped Cap Adj	0.971	0.986	1.000	0.992
Approach Delay, s/veh	20.8	11.1	6.6	11.0
Approach LOS	C	B	A	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	4.200	4.200	4.200	4.200
Entry Flow, veh/h	895	720	25	328
Cap Entry Lane, veh/h	1122	1188	594	748
Entry HV Adj Factor	0.980	0.979	0.996	0.978
Flow Entry, veh/h	877	705	25	321
Cap Entry, veh/h	1067	1147	592	726
V/C Ratio	0.822	0.615	0.042	0.442
Control Delay, s/veh	20.8	11.1	6.6	11.0
LOS	C	B	A	B
95th %tile Queue, veh	10	4	0	2

Future Cumulative + Alternative 1

Intersection	
Intersection Delay, s/veh	20.6
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	821	870	341	139
Demand Flow Rate, veh/h	838	888	348	142
Vehicles Circulating, veh/h	321	252	784	981
Vehicles Exiting, veh/h	802	880	375	159
Follow-Up Headway, s	2.800	2.800	2.800	2.800
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	23.4	22.8	12.8	9.2
Approach LOS	C	C	B	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	4.200	4.200	4.200	4.200
Entry Flow, veh/h	838	888	348	142
Cap Entry Lane, veh/h	1002	1057	699	599
Entry HV Adj Factor	0.980	0.979	0.981	0.980
Flow Entry, veh/h	821	870	341	139
Cap Entry, veh/h	982	1035	685	587
V/C Ratio	0.837	0.840	0.498	0.237
Control Delay, s/veh	23.4	22.8	12.8	9.2
LOS	C	C	B	A
95th %tile Queue, veh	10	10	3	1

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	804	3	9	724	2	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	838	3	9	754	2	19

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	841	0	1612	839
Stage 1	-	-	-	-	839	-
Stage 2	-	-	-	-	773	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	794	-	115	366
Stage 1	-	-	-	-	424	-
Stage 2	-	-	-	-	455	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	794	-	114	366
Mov Cap-2 Maneuver	-	-	-	-	312	-
Stage 1	-	-	-	-	424	-
Stage 2	-	-	-	-	450	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	15.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	360	-	-	794	-
HCM Lane V/C Ratio	0.058	-	-	0.012	-
HCM Control Delay (s)	15.6	-	-	9.6	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	35.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	37	811	12	17	682	29	7	0	19	51	0	48
Conflicting Peds, #/hr	28	0	120	120	0	28	153	0	0	0	0	153
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	80	-	-	80	-	-	-	-	-	-	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	38	836	12	18	703	30	7	0	20	53	0	49

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	886	0	0	1001	0	0	2003	1993	1115	1987	1984	991
Stage 1	-	-	-	-	-	-	1072	1072	-	906	906	-
Stage 2	-	-	-	-	-	-	931	921	-	1081	1078	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	764	-	-	692	-	-	44	60	253	~ 46	61	299
Stage 1	-	-	-	-	-	-	267	297	-	331	355	-
Stage 2	-	-	-	-	-	-	320	349	-	264	295	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	688	-	-	623	-	-	26	42	199	~ 31	43	235
Mov Cap-2 Maneuver	-	-	-	-	-	-	26	42	-	~ 31	43	-
Stage 1	-	-	-	-	-	-	220	245	-	273	301	-
Stage 2	-	-	-	-	-	-	221	296	-	202	243	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.3	83.7	$ 583.1
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	71	688	-	-	623	-	-	54
HCM Lane V/C Ratio	0.378	0.055	-	-	0.028	-	-	1.89
HCM Control Delay (s)	83.7	10.5	-	-	10.9	-	-	$ 583.1
HCM Lane LOS	F	B	-	-	B	-	-	F
HCM 95th %tile Q(veh)	1.4	0.2	-	-	0.1	-	-	9.9

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	343	691	1	0	589	382	1	1	0	399	2	415
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		1.00	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	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	361	727	1	0	620	402	1	1	0	420	2	437
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	1
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	397	2130	3	2	653	423	2	2	0	477	2	427
Arrive On Green	0.22	0.59	0.59	0.00	0.32	0.32	0.00	0.00	0.00	0.27	0.27	0.27
Sat Flow, veh/h	1774	3626	5	1774	2061	1336	909	909	0	1766	8	1583
Grp Volume(v), veh/h	361	355	373	0	532	490	2	0	0	422	0	437
Grp Sat Flow(s),veh/h/ln	1774	1770	1862	1774	1770	1627	1817	0	0	1774	0	1583
Q Serve(g_s), s	16.9	8.8	8.8	0.0	25.1	25.1	0.1	0.0	0.0	19.4	0.0	23.0
Cycle Q Clear(g_c), s	16.9	8.8	8.8	0.0	25.1	25.1	0.1	0.0	0.0	19.4	0.0	23.0
Prop In Lane	1.00		0.00	1.00		0.82	0.50		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	397	1039	1093	2	561	515	4	0	0	479	0	427
V/C Ratio(X)	0.91	0.34	0.34	0.00	0.95	0.95	0.51	0.00	0.00	0.88	0.00	1.02
Avail Cap(c_a), veh/h	416	1039	1093	83	561	515	85	0	0	479	0	427
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	0.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.3	9.1	9.1	0.0	28.5	28.5	42.5	0.0	0.0	29.8	0.0	31.1
Incr Delay (d2), s/veh	23.2	0.2	0.2	0.0	26.0	27.5	75.6	0.0	0.0	17.2	0.0	49.5
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(95%),veh/ln	16.2	7.7	8.0	0.0	22.8	21.5	0.2	0.0	0.0	17.4	0.0	28.6
LnGrp Delay(d),s/veh	55.4	9.3	9.3	0.0	54.5	56.0	118.1	0.0	0.0	47.0	0.0	80.6
LnGrp LOS	E	A	A		D	E	F			D		F
Approach Vol, veh/h		1089			1022			2			859	
Approach Delay, s/veh		24.6			55.2			118.1			64.1	
Approach LOS		C			E			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	0.0	54.1		27.0	23.1	31.0		4.2
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	4.0	43.0		23.0	20.0	27.0		4.0
Max Q Clear Time (g_c+I1), s	0.0	10.8		25.0	18.9	27.1		2.1
Green Ext Time (p_c), s	0.0	15.4		0.0	0.1	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	46.6
HCM 2010 LOS	D

Intersection	
Intersection Delay, s/veh	12.1
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	778	779	61	184
Demand Flow Rate, veh/h	794	795	62	188
Vehicles Circulating, veh/h	73	120	811	813
Vehicles Exiting, veh/h	928	753	56	102
Follow-Up Headway, s	2.800	2.800	2.800	2.800
Ped Vol Crossing Leg, #/h	100	90	17	62
Ped Cap Adj	0.986	0.988	0.998	0.992
Approach Delay, s/veh	12.2	13.3	6.4	8.9
Approach LOS	B	B	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	4.200	4.200	4.200	4.200
Entry Flow, veh/h	794	795	62	188
Cap Entry Lane, veh/h	1215	1171	684	683
Entry HV Adj Factor	0.979	0.980	0.984	0.979
Flow Entry, veh/h	778	779	61	184
Cap Entry, veh/h	1173	1134	671	663
V/C Ratio	0.663	0.687	0.091	0.278
Control Delay, s/veh	12.2	13.3	6.4	8.9
LOS	B	B	A	A
95th %tile Queue, veh	5	6	0	1

Intersection	
Intersection Delay, s/veh	16.9
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	905	754	30	318
Demand Flow Rate, veh/h	924	770	30	325
Vehicles Circulating, veh/h	172	110	1016	751
Vehicles Exiting, veh/h	904	936	80	129
Follow-Up Headway, s	2.800	2.800	2.800	2.800
Ped Vol Crossing Leg, #/h	132	99	46	55
Ped Cap Adj	0.971	0.986	1.000	0.992
Approach Delay, s/veh	22.8	12.4	6.8	11.7
Approach LOS	C	B	A	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	4.200	4.200	4.200	4.200
Entry Flow, veh/h	924	770	30	325
Cap Entry Lane, veh/h	1125	1180	583	717
Entry HV Adj Factor	0.980	0.980	0.997	0.978
Flow Entry, veh/h	905	754	30	318
Cap Entry, veh/h	1070	1140	581	696
V/C Ratio	0.846	0.661	0.051	0.457
Control Delay, s/veh	22.8	12.4	6.8	11.7
LOS	C	B	A	B
95th %tile Queue, veh	11	5	0	2

Future Cumulative + Alternative 2

Intersection	
Intersection Delay, s/veh	19.2
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	782	866	332	139
Demand Flow Rate, veh/h	798	884	339	142
Vehicles Circulating, veh/h	323	253	743	978
Vehicles Exiting, veh/h	797	829	378	159
Follow-Up Headway, s	2.800	2.800	2.800	2.800
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	20.4	22.5	11.9	9.2
Approach LOS	C	C	B	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	4.200	4.200	4.200	4.200
Entry Flow, veh/h	798	884	339	142
Cap Entry Lane, veh/h	1000	1056	721	601
Entry HV Adj Factor	0.980	0.979	0.980	0.980
Flow Entry, veh/h	782	866	332	139
Cap Entry, veh/h	980	1034	707	589
V/C Ratio	0.798	0.837	0.470	0.236
Control Delay, s/veh	20.4	22.5	11.9	9.2
LOS	C	C	B	A
95th %tile Queue, veh	9	10	3	1

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	794	3	11	696	2	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	827	3	11	725	2	19

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	830	0	1577	829
Stage 1	-	-	-	-	829	-
Stage 2	-	-	-	-	748	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	802	-	121	370
Stage 1	-	-	-	-	429	-
Stage 2	-	-	-	-	468	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	802	-	119	370
Mov Cap-2 Maneuver	-	-	-	-	319	-
Stage 1	-	-	-	-	429	-
Stage 2	-	-	-	-	462	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	15.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	364	-	-	802	-
HCM Lane V/C Ratio	0.057	-	-	0.014	-
HCM Control Delay (s)	15.5	-	-	9.6	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	46

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	44	808	12	17	649	34	7	0	19	57	0	54
Conflicting Peds, #/hr	28	0	120	120	0	28	153	0	0	0	0	153
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	80	-	-	80	-	-	-	-	-	-	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	45	833	12	18	669	35	7	0	20	59	0	56

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	857	0	0	998	0	0	1985	1975	1112	1968	1964	960
Stage 1	-	-	-	-	-	-	1083	1083	-	875	875	-
Stage 2	-	-	-	-	-	-	902	892	-	1093	1089	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	783	-	-	693	-	-	46	62	254	~ 47	63	311
Stage 1	-	-	-	-	-	-	263	293	-	344	367	-
Stage 2	-	-	-	-	-	-	332	360	-	260	291	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	705	-	-	624	-	-	26	43	199	~ 31	44	244
Mov Cap-2 Maneuver	-	-	-	-	-	-	26	43	-	~ 31	44	-
Stage 1	-	-	-	-	-	-	215	239	-	281	311	-
Stage 2	-	-	-	-	-	-	224	305	-	198	238	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.3	83.7	$ 679.8
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	71	705	-	-	624	-	-	54
HCM Lane V/C Ratio	0.378	0.064	-	-	0.028	-	-	2.119
HCM Control Delay (s)	83.7	10.5	-	-	10.9	-	-	$ 679.8
HCM Lane LOS	F	B	-	-	B	-	-	F
HCM 95th %tile Q(veh)	1.4	0.2	-	-	0.1	-	-	11.3

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	359	689	1	0	579	373	1	1	0	390	2	443
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		1.00	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	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	378	725	1	0	609	393	1	1	0	411	2	466
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	1
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	414	2126	3	2	631	407	2	2	0	478	2	428
Arrive On Green	0.23	0.59	0.59	0.00	0.31	0.31	0.00	0.00	0.00	0.27	0.27	0.27
Sat Flow, veh/h	1774	3626	5	1774	2065	1332	909	909	0	1766	9	1583
Grp Volume(v), veh/h	378	354	372	0	522	480	2	0	0	413	0	466
Grp Sat Flow(s),veh/h/ln	1774	1770	1862	1774	1770	1628	1817	0	0	1774	0	1583
Q Serve(g_s), s	17.6	8.8	8.8	0.0	24.7	24.7	0.1	0.0	0.0	18.8	0.0	23.0
Cycle Q Clear(g_c), s	17.6	8.8	8.8	0.0	24.7	24.7	0.1	0.0	0.0	18.8	0.0	23.0
Prop In Lane	1.00		0.00	1.00		0.82	0.50		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	414	1037	1091	2	541	498	4	0	0	480	0	428
V/C Ratio(X)	0.91	0.34	0.34	0.00	0.96	0.96	0.51	0.00	0.00	0.86	0.00	1.09
Avail Cap(c_a), veh/h	438	1037	1091	83	541	498	85	0	0	480	0	428
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	0.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.8	9.1	9.1	0.0	29.1	29.1	42.4	0.0	0.0	29.5	0.0	31.0
Incr Delay (d2), s/veh	22.7	0.2	0.2	0.0	29.8	31.3	75.6	0.0	0.0	14.6	0.0	69.3
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(95%),veh/ln	16.7	7.7	8.0	0.0	23.2	21.8	0.2	0.0	0.0	16.6	0.0	32.8
LnGrp Delay(d),s/veh	54.5	9.3	9.3	0.0	58.8	60.4	118.0	0.0	0.0	44.1	0.0	100.3
LnGrp LOS	D	A	A		E	E	F			D		F
Approach Vol, veh/h		1104			1002			2			879	
Approach Delay, s/veh		24.8			59.6			118.0			73.9	
Approach LOS		C			E			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	0.0	53.8		27.0	23.8	30.0		4.2
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	4.0	43.0		23.0	21.0	26.0		4.0
Max Q Clear Time (g_c+I1), s	0.0	10.8		25.0	19.6	26.7		2.1
Green Ext Time (p_c), s	0.0	15.1		0.0	0.2	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	51.0
HCM 2010 LOS	D

Intersection	
Intersection Delay, s/veh	11.9
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	774	767	61	187
Demand Flow Rate, veh/h	790	782	62	191
Vehicles Circulating, veh/h	75	121	808	800
Vehicles Exiting, veh/h	916	749	57	103
Follow-Up Headway, s	2.800	2.800	2.800	2.800
Ped Vol Crossing Leg, #/h	100	90	17	62
Ped Cap Adj	0.986	0.988	0.998	0.992
Approach Delay, s/veh	12.1	12.9	6.3	8.8
Approach LOS	B	B	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	4.200	4.200	4.200	4.200
Entry Flow, veh/h	790	782	62	191
Cap Entry Lane, veh/h	1213	1170	686	690
Entry HV Adj Factor	0.979	0.980	0.984	0.979
Flow Entry, veh/h	774	767	61	187
Cap Entry, veh/h	1172	1133	673	670
V/C Ratio	0.660	0.677	0.091	0.279
Control Delay, s/veh	12.1	12.9	6.3	8.8
LOS	B	B	A	A
95th %tile Queue, veh	5	6	0	1

Intersection	
Intersection Delay, s/veh	17.1
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	906	758	31	321
Demand Flow Rate, veh/h	925	774	31	328
Vehicles Circulating, veh/h	174	111	1019	756
Vehicles Exiting, veh/h	910	939	80	129
Follow-Up Headway, s	2.800	2.800	2.800	2.800
Ped Vol Crossing Leg, #/h	132	99	46	55
Ped Cap Adj	0.971	0.986	1.000	0.992
Approach Delay, s/veh	23.0	12.5	6.8	11.9
Approach LOS	C	B	A	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	4.200	4.200	4.200	4.200
Entry Flow, veh/h	925	774	31	328
Cap Entry Lane, veh/h	1123	1179	582	714
Entry HV Adj Factor	0.980	0.980	0.997	0.978
Flow Entry, veh/h	906	758	31	321
Cap Entry, veh/h	1068	1140	580	693
V/C Ratio	0.849	0.665	0.053	0.463
Control Delay, s/veh	23.0	12.5	6.8	11.9
LOS	C	B	A	B
95th %tile Queue, veh	11	5	0	2

Future Cumulative + Alternative 3

Intersection	
Intersection Delay, s/veh	22.0
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	831	892	348	139
Demand Flow Rate, veh/h	848	911	355	142
Vehicles Circulating, veh/h	331	249	797	1001
Vehicles Exiting, veh/h	812	903	382	159
Follow-Up Headway, s	2.800	2.800	2.800	2.800
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	25.0	24.6	13.3	9.4
Approach LOS	D	C	B	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	4.200	4.200	4.200	4.200
Entry Flow, veh/h	848	911	355	142
Cap Entry Lane, veh/h	994	1059	692	590
Entry HV Adj Factor	0.980	0.980	0.981	0.980
Flow Entry, veh/h	831	892	348	139
Cap Entry, veh/h	974	1038	679	578
V/C Ratio	0.853	0.860	0.513	0.241
Control Delay, s/veh	25.0	24.6	13.3	9.4
LOS	D	C	B	A
95th %tile Queue, veh	11	11	3	1

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	827	3	10	742	2	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	861	3	10	773	2	19

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	865	0	1657	863
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	794	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	778	-	108	354
Stage 1	-	-	-	-	413	-
Stage 2	-	-	-	-	445	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	778	-	107	354
Mov Cap-2 Maneuver	-	-	-	-	303	-
Stage 1	-	-	-	-	413	-
Stage 2	-	-	-	-	439	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	16
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	348	-	-	778	-
HCM Lane V/C Ratio	0.06	-	-	0.013	-
HCM Control Delay (s)	16	-	-	9.7	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	54.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	42	825	12	17	682	33	7	0	19	60	0	57
Conflicting Peds, #/hr	28	0	120	120	0	28	153	0	0	0	0	153
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	80	-	-	80	-	-	-	-	-	-	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	43	851	12	18	703	34	7	0	20	62	0	59

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	890	0	0	1016	0	0	2034	2021	1130	2014	2010	993
Stage 1	-	-	-	-	-	-	1096	1096	-	908	908	-
Stage 2	-	-	-	-	-	-	938	925	-	1106	1102	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	761	-	-	683	-	-	42	58	248	~ 44	59	298
Stage 1	-	-	-	-	-	-	259	289	-	330	354	-
Stage 2	-	-	-	-	-	-	317	348	-	255	287	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	685	-	-	615	-	-	23	40	195	~ 29	41	234
Mov Cap-2 Maneuver	-	-	-	-	-	-	23	40	-	~ 29	41	-
Stage 1	-	-	-	-	-	-	212	236	-	270	300	-
Stage 2	-	-	-	-	-	-	207	295	-	193	235	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.3	94.8	$ 794.4
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	65	685	-	-	615	-	-	51
HCM Lane V/C Ratio	0.412	0.063	-	-	0.028	-	-	2.365
HCM Control Delay (s)	94.8	10.6	-	-	11	-	-	$ 794.4
HCM Lane LOS	F	B	-	-	B	-	-	F
HCM 95th %tile Q(veh)	1.6	0.2	-	-	0.1	-	-	12.4

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	360	695	1	0	588	385	1	1	0	399	2	432
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		1.00	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	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	379	732	1	0	619	405	1	1	0	420	2	455
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	1
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	415	2127	3	2	627	410	2	2	0	477	2	428
Arrive On Green	0.23	0.59	0.59	0.00	0.31	0.31	0.00	0.00	0.00	0.27	0.27	0.27
Sat Flow, veh/h	1774	3627	5	1774	2053	1343	909	909	0	1766	8	1583
Grp Volume(v), veh/h	379	357	376	0	534	490	2	0	0	422	0	455
Grp Sat Flow(s),veh/h/ln	1774	1770	1862	1774	1770	1626	1817	0	0	1774	0	1583
Q Serve(g_s), s	17.7	8.9	8.9	0.0	25.5	25.5	0.1	0.0	0.0	19.4	0.0	23.0
Cycle Q Clear(g_c), s	17.7	8.9	8.9	0.0	25.5	25.5	0.1	0.0	0.0	19.4	0.0	23.0
Prop In Lane	1.00		0.00	1.00		0.83	0.50		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	415	1038	1092	2	541	497	4	0	0	480	0	428
V/C Ratio(X)	0.91	0.34	0.34	0.00	0.99	0.99	0.51	0.00	0.00	0.88	0.00	1.06
Avail Cap(c_a), veh/h	438	1038	1092	83	541	497	85	0	0	480	0	428
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	0.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.8	9.1	9.1	0.0	29.4	29.4	42.4	0.0	0.0	29.7	0.0	31.0
Incr Delay (d2), s/veh	22.8	0.2	0.2	0.0	35.2	36.9	75.6	0.0	0.0	17.0	0.0	61.2
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(95%),veh/ln	16.8	7.7	8.0	0.0	24.6	23.2	0.2	0.0	0.0	17.4	0.0	31.1
LnGrp Delay(d),s/veh	54.6	9.3	9.3	0.0	64.5	66.3	118.0	0.0	0.0	46.7	0.0	92.2
LnGrp LOS	D	A	A		E	E	F			D		F
Approach Vol, veh/h		1112			1024			2			877	
Approach Delay, s/veh		24.7			65.4			118.0			70.3	
Approach LOS		C			E			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	0.0	53.9		27.0	23.9	30.0		4.2
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	4.0	43.0		23.0	21.0	26.0		4.0
Max Q Clear Time (g_c+I1), s	0.0	10.9		25.0	19.7	27.5		2.1
Green Ext Time (p_c), s	0.0	15.4		0.0	0.2	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	51.9
HCM 2010 LOS	D

Intersection	
Intersection Delay, s/veh	11.9
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	772	778	61	167
Demand Flow Rate, veh/h	787	794	62	171
Vehicles Circulating, veh/h	67	112	800	812
Vehicles Exiting, veh/h	916	750	54	94
Follow-Up Headway, s	2.800	2.800	2.800	2.800
Ped Vol Crossing Leg, #/h	100	90	17	62
Ped Cap Adj	0.986	0.988	0.998	0.992
Approach Delay, s/veh	11.9	13.0	6.3	8.5
Approach LOS	B	B	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	4.200	4.200	4.200	4.200
Entry Flow, veh/h	787	794	62	171
Cap Entry Lane, veh/h	1220	1178	690	684
Entry HV Adj Factor	0.980	0.980	0.984	0.977
Flow Entry, veh/h	772	778	61	167
Cap Entry, veh/h	1180	1141	677	662
V/C Ratio	0.654	0.682	0.090	0.252
Control Delay, s/veh	11.9	13.0	6.3	8.5
LOS	B	B	A	A
95th %tile Queue, veh	5	6	0	1

Intersection	
Intersection Delay, s/veh	14.8
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	869	728	30	287
Demand Flow Rate, veh/h	887	743	30	292
Vehicles Circulating, veh/h	155	102	971	724
Vehicles Exiting, veh/h	861	899	71	121
Follow-Up Headway, s	2.800	2.800	2.800	2.800
Ped Vol Crossing Leg, #/h	132	99	46	55
Ped Cap Adj	0.970	0.986	1.000	0.992
Approach Delay, s/veh	19.2	11.6	6.5	10.4
Approach LOS	C	B	A	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	4.200	4.200	4.200	4.200
Entry Flow, veh/h	887	743	30	292
Cap Entry Lane, veh/h	1140	1188	604	732
Entry HV Adj Factor	0.979	0.979	0.997	0.982
Flow Entry, veh/h	869	728	30	287
Cap Entry, veh/h	1083	1147	602	714
V/C Ratio	0.802	0.634	0.050	0.402
Control Delay, s/veh	19.2	11.6	6.5	10.4
LOS	C	B	A	B
95th %tile Queue, veh	9	5	0	2

Future Cumulative + Alternative 4

Intersection	
Intersection Delay, s/veh	21.2
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	800	901	342	139
Demand Flow Rate, veh/h	816	920	349	142
Vehicles Circulating, veh/h	334	245	772	1006
Vehicles Exiting, veh/h	814	876	378	159
Follow-Up Headway, s	2.800	2.800	2.800	2.800
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	22.4	25.1	12.7	9.4
Approach LOS	C	D	B	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	4.200	4.200	4.200	4.200
Entry Flow, veh/h	816	920	349	142
Cap Entry Lane, veh/h	992	1063	705	588
Entry HV Adj Factor	0.980	0.980	0.981	0.980
Flow Entry, veh/h	800	901	342	139
Cap Entry, veh/h	972	1041	692	576
V/C Ratio	0.823	0.866	0.495	0.242
Control Delay, s/veh	22.4	25.1	12.7	9.4
LOS	C	D	B	A
95th %tile Queue, veh	10	12	3	1

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	26	842	3	10	727	62	2	0	18	31	0	31
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	-	-	None	-	-	None
Storage Length	50	-	-	50	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	877	3	10	757	65	2	0	19	32	0	32

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	822	0	0	880	0	0	1760	1776	879	1752	1744	790
Stage 1	-	-	-	-	-	-	933	933	-	810	810	-
Stage 2	-	-	-	-	-	-	827	843	-	942	934	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	807	-	-	768	-	-	66	83	347	67	86	390
Stage 1	-	-	-	-	-	-	319	345	-	374	393	-
Stage 2	-	-	-	-	-	-	366	380	-	316	345	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	807	-	-	768	-	-	58	79	347	61	82	390
Mov Cap-2 Maneuver	-	-	-	-	-	-	212	240	-	171	198	-
Stage 1	-	-	-	-	-	-	308	333	-	361	388	-
Stage 2	-	-	-	-	-	-	331	375	-	289	333	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.1	16.8	25.7
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	326	807	-	-	768	-	-	238
HCM Lane V/C Ratio	0.064	0.034	-	-	0.014	-	-	0.271
HCM Control Delay (s)	16.8	9.6	-	-	9.8	-	-	25.7
HCM Lane LOS	C	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-	-	1.1

Intersection	
Int Delay, s/veh	35.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	36	827	12	17	662	28	7	0	19	50	0	47
Conflicting Peds, #/hr	28	0	120	120	0	28	153	0	0	0	0	153
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	80	-	-	80	-	-	-	-	-	-	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	37	853	12	18	682	29	7	0	20	52	0	48

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	864	0	0	1018	0	0	1995	1985	1132	1981	1977	970
Stage 1	-	-	-	-	-	-	1086	1086	-	885	885	-
Stage 2	-	-	-	-	-	-	909	899	-	1096	1092	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	779	-	-	682	-	-	45	61	247	~ 46	62	307
Stage 1	-	-	-	-	-	-	262	292	-	340	363	-
Stage 2	-	-	-	-	-	-	329	358	-	259	291	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	701	-	-	614	-	-	26	43	194	~ 30	43	241
Mov Cap-2 Maneuver	-	-	-	-	-	-	26	43	-	~ 30	43	-
Stage 1	-	-	-	-	-	-	217	241	-	281	307	-
Stage 2	-	-	-	-	-	-	230	303	-	199	240	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.3	83.7	$ 602.9
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	71	701	-	-	614	-	-	52
HCM Lane V/C Ratio	0.378	0.053	-	-	0.029	-	-	1.923
HCM Control Delay (s)	83.7	10.4	-	-	11	-	-	$ 602.9
HCM Lane LOS	F	B	-	-	B	-	-	F
HCM 95th %tile Q(veh)	1.4	0.2	-	-	0.1	-	-	9.8

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	351	696	1	0	583	378	1	1	0	399	2	435
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		1.00	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	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	369	733	1	0	614	398	1	1	0	420	2	458
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	1
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	403	2136	3	2	649	421	2	2	0	475	2	425
Arrive On Green	0.23	0.59	0.59	0.00	0.31	0.31	0.00	0.00	0.00	0.27	0.27	0.27
Sat Flow, veh/h	1774	3627	5	1774	2061	1336	909	909	0	1766	8	1583
Grp Volume(v), veh/h	369	358	376	0	527	485	2	0	0	422	0	458
Grp Sat Flow(s),veh/h/ln	1774	1770	1862	1774	1770	1627	1817	0	0	1774	0	1583
Q Serve(g_s), s	17.4	8.9	8.9	0.0	24.9	24.9	0.1	0.0	0.0	19.5	0.0	23.0
Cycle Q Clear(g_c), s	17.4	8.9	8.9	0.0	24.9	24.9	0.1	0.0	0.0	19.5	0.0	23.0
Prop In Lane	1.00		0.00	1.00		0.82	0.50		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	403	1042	1096	2	557	512	4	0	0	477	0	425
V/C Ratio(X)	0.92	0.34	0.34	0.00	0.95	0.95	0.51	0.00	0.00	0.88	0.00	1.08
Avail Cap(c_a), veh/h	415	1042	1096	83	558	513	85	0	0	477	0	425
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	0.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.3	9.1	9.1	0.0	28.6	28.6	42.7	0.0	0.0	30.0	0.0	31.3
Incr Delay (d2), s/veh	24.3	0.2	0.2	0.0	25.3	26.8	75.6	0.0	0.0	17.7	0.0	65.6
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(95%),veh/ln	16.7	7.7	8.1	0.0	22.7	21.3	0.2	0.0	0.0	17.5	0.0	32.0
LnGrp Delay(d),s/veh	56.6	9.3	9.3	0.0	54.0	55.4	118.3	0.0	0.0	47.8	0.0	96.9
LnGrp LOS	E	A	A		D	E	F			D		F
Approach Vol, veh/h		1103			1012			2			880	
Approach Delay, s/veh		25.1			54.7			118.3			73.3	
Approach LOS		C			D			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	0.0	54.4		27.0	23.5	30.9		4.2
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	4.0	43.0		23.0	20.0	27.0		4.0
Max Q Clear Time (g_c+I1), s	0.0	10.9		25.0	19.4	26.9		2.1
Green Ext Time (p_c), s	0.0	15.3		0.0	0.1	0.1		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	49.3
HCM 2010 LOS	D

Intersection	
Intersection Delay, s/veh	12.0
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	778	768	60	188
Demand Flow Rate, veh/h	794	783	61	192
Vehicles Circulating, veh/h	74	119	812	800
Vehicles Exiting, veh/h	918	754	56	102
Follow-Up Headway, s	2.800	2.800	2.800	2.800
Ped Vol Crossing Leg, #/h	100	90	17	62
Ped Cap Adj	0.986	0.988	0.998	0.992
Approach Delay, s/veh	12.2	12.9	6.3	8.9
Approach LOS	B	B	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	4.200	4.200	4.200	4.200
Entry Flow, veh/h	794	783	61	192
Cap Entry Lane, veh/h	1214	1172	684	690
Entry HV Adj Factor	0.979	0.980	0.983	0.979
Flow Entry, veh/h	778	768	60	188
Cap Entry, veh/h	1172	1135	671	670
V/C Ratio	0.663	0.676	0.089	0.281
Control Delay, s/veh	12.2	12.9	6.3	8.9
LOS	B	B	A	A
95th %tile Queue, veh	5	6	0	1

Intersection	
Intersection Delay, s/veh	17.3
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	913	755	30	325
Demand Flow Rate, veh/h	932	771	30	332
Vehicles Circulating, veh/h	175	110	1027	752
Vehicles Exiting, veh/h	909	947	80	129
Follow-Up Headway, s	2.800	2.800	2.800	2.800
Ped Vol Crossing Leg, #/h	132	99	46	55
Ped Cap Adj	0.971	0.986	1.000	0.992
Approach Delay, s/veh	23.7	12.4	6.8	12.0
Approach LOS	C	B	A	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	4.200	4.200	4.200	4.200
Entry Flow, veh/h	932	771	30	332
Cap Entry Lane, veh/h	1122	1180	578	716
Entry HV Adj Factor	0.980	0.980	0.997	0.978
Flow Entry, veh/h	913	755	30	325
Cap Entry, veh/h	1067	1140	577	696
V/C Ratio	0.856	0.662	0.052	0.467
Control Delay, s/veh	23.7	12.4	6.8	12.0
LOS	C	B	A	B
95th %tile Queue, veh	11	5	0	2

LOS Output Scenarios for SR 28 & TC Lodge

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	10	721	659	11	14	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	759	694	12	15	7

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	705	0	-	0	1479	699
Stage 1	-	-	-	-	699	-
Stage 2	-	-	-	-	780	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	893	-	-	-	138	440
Stage 1	-	-	-	-	493	-
Stage 2	-	-	-	-	452	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	893	-	-	-	136	440
Mov Cap-2 Maneuver	-	-	-	-	276	-
Stage 1	-	-	-	-	493	-
Stage 2	-	-	-	-	446	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	17.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	893	-	-	-	315
HCM Lane V/C Ratio	0.012	-	-	-	0.07
HCM Control Delay (s)	9.1	-	-	-	17.3
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	54	714	620	32	11	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	57	752	653	34	12	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	686	0	-	0	1534	669
Stage 1	-	-	-	-	669	-
Stage 2	-	-	-	-	865	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	908	-	-	-	128	458
Stage 1	-	-	-	-	509	-
Stage 2	-	-	-	-	412	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	908	-	-	-	120	458
Mov Cap-2 Maneuver	-	-	-	-	254	-
Stage 1	-	-	-	-	509	-
Stage 2	-	-	-	-	386	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	16.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	908	-	-	-	342
HCM Lane V/C Ratio	0.063	-	-	-	0.08
HCM Control Delay (s)	9.2	-	-	-	16.4
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	0.3

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	2	712	627	0	2	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	749	660	0	2	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	660	0	-	0	1414	660
Stage 1	-	-	-	-	660	-
Stage 2	-	-	-	-	754	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	928	-	-	-	152	463
Stage 1	-	-	-	-	514	-
Stage 2	-	-	-	-	465	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	928	-	-	-	152	463
Mov Cap-2 Maneuver	-	-	-	-	292	-
Stage 1	-	-	-	-	514	-
Stage 2	-	-	-	-	464	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	17.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	928	-	-	-	292
HCM Lane V/C Ratio	0.002	-	-	-	0.007
HCM Control Delay (s)	8.9	-	-	-	17.4
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	54	736	638	32	11	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	57	775	672	34	12	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	705	0	-	0	1576	688
Stage 1	-	-	-	-	688	-
Stage 2	-	-	-	-	888	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	893	-	-	-	121	446
Stage 1	-	-	-	-	499	-
Stage 2	-	-	-	-	402	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	893	-	-	-	113	446
Mov Cap-2 Maneuver	-	-	-	-	246	-
Stage 1	-	-	-	-	499	-
Stage 2	-	-	-	-	376	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	16.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	893	-	-	-	332
HCM Lane V/C Ratio	0.064	-	-	-	0.082
HCM Control Delay (s)	9.3	-	-	-	16.8
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	0.3

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	14	768	671	3	10	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	808	706	3	11	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	709	0	-	0	1546	708
Stage 1	-	-	-	-	708	-
Stage 2	-	-	-	-	838	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	890	-	-	-	126	435
Stage 1	-	-	-	-	488	-
Stage 2	-	-	-	-	424	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	890	-	-	-	124	435
Mov Cap-2 Maneuver	-	-	-	-	261	-
Stage 1	-	-	-	-	488	-
Stage 2	-	-	-	-	417	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	17.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	890	-	-	-	295
HCM Lane V/C Ratio	0.017	-	-	-	0.05
HCM Control Delay (s)	9.1	-	-	-	17.8
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	54	796	694	32	11	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	57	838	731	34	12	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	764	0	-	0	1699	747
Stage 1	-	-	-	-	747	-
Stage 2	-	-	-	-	952	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	849	-	-	-	101	413
Stage 1	-	-	-	-	468	-
Stage 2	-	-	-	-	375	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	849	-	-	-	94	413
Mov Cap-2 Maneuver	-	-	-	-	225	-
Stage 1	-	-	-	-	468	-
Stage 2	-	-	-	-	350	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	18
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	849	-	-	-	305
HCM Lane V/C Ratio	0.067	-	-	-	0.09
HCM Control Delay (s)	9.5	-	-	-	18
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	0.3

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	2	795	702	0	2	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	837	739	0	2	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	739	0	-	0	1580	739
Stage 1	-	-	-	-	739	-
Stage 2	-	-	-	-	841	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	867	-	-	-	120	417
Stage 1	-	-	-	-	472	-
Stage 2	-	-	-	-	423	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	867	-	-	-	120	417
Mov Cap-2 Maneuver	-	-	-	-	258	-
Stage 1	-	-	-	-	472	-
Stage 2	-	-	-	-	422	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	19.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	867	-	-	-	258
HCM Lane V/C Ratio	0.002	-	-	-	0.008
HCM Control Delay (s)	9.2	-	-	-	19.1
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	54	819	712	32	11	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	57	862	749	34	12	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	783	0	-	0	1742	766
Stage 1	-	-	-	-	766	-
Stage 2	-	-	-	-	976	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	835	-	-	-	95	403
Stage 1	-	-	-	-	459	-
Stage 2	-	-	-	-	365	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	835	-	-	-	89	403
Mov Cap-2 Maneuver	-	-	-	-	218	-
Stage 1	-	-	-	-	459	-
Stage 2	-	-	-	-	340	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	18.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	835	-	-	-	297
HCM Lane V/C Ratio	0.068	-	-	-	0.092
HCM Control Delay (s)	9.6	-	-	-	18.3
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	0.3

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	14	861	757	3	10	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	906	797	3	11	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	800	0	-	0	1734	798
Stage 1	-	-	-	-	798	-
Stage 2	-	-	-	-	936	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	823	-	-	-	96	386
Stage 1	-	-	-	-	443	-
Stage 2	-	-	-	-	382	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	823	-	-	-	94	386
Mov Cap-2 Maneuver	-	-	-	-	228	-
Stage 1	-	-	-	-	443	-
Stage 2	-	-	-	-	375	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	19.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	823	-	-	-	258
HCM Lane V/C Ratio	0.018	-	-	-	0.057
HCM Control Delay (s)	9.5	-	-	-	19.8
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Appendix G-5

SR28 Roadway Capacity in Tahoe City and Kings Beach

SR 28 Roadway Capacity in Tahoe City and Kings Beach

There is no standard traffic engineering analysis technique regarding the capacity associated with urban three-lane roadways operating under congested conditions with heavy parking, pedestrian and bicycle activity. This question was addressed in detail in the traffic study conducted for the Kings Beach Commercial Core Improvement Project, as fully documented in Appendix L of the *Kings Beach Commercial Core Improvement Project Draft Environmental Assessment/Environmental Impact Report/Environmental Impact Statement* (Jones and Stokes, March 2007). This methodology was based on traffic counts conducted in Tahoe City, and a calibration of a simple model based upon roadway factors impacting traffic capacity.

Specifically, LSC staff conducted manual traffic counts on SR 28 in Tahoe City in the summer of 2002, taken just east of the State Recreation Area on the east side of town, as follows:

Observed Capacity (Vehicles per Hour)	Eastbound	Westbound
Friday, July 12, 2002 - Starting 2:15 PM	822	698
Friday, August 9, 2002 - Starting 12:45 PM	709	741

Both counts were conducted when there was a stop-and-go queue formed by traffic entering Tahoe City from the east. While capacity varies with the level of pedestrian, bicycling, and parking activity, for typical levels of activity on SR 28 in Tahoe City, this data indicates a westbound capacity entering Tahoe City of 730 and an eastbound capacity exiting Tahoe City of 750.

These figures are far below (less than half of) the theoretical capacity of a two-lane roadway. An assessment was conducted regarding the impact of a variety of observed factors in Tahoe City that reduce capacity, and then adjusted to reflect the differing level of various factors impacting traffic capacity along SR 28 in Kings Beach versus Tahoe City. These factors are discussed below:

- **Driver characteristics** impact traffic flow. Recreational drivers tend to drive more erratically than commuters (for instance) and are more distracted by sights along the way. As a result, a "base" figure of 1,500 vehicles per hour per lane is appropriate (rather than the maximum value of 1,900 observed in other settings).

- **Pedestrians crossing the highway** require a portion of the time otherwise available for traffic movement. Counts and delay observations conducted during busy summer conditions in Tahoe City indicate that 16.2 percent of total potential roadway capacity is eliminated due to this factor.

- Similarly **bicyclists crossing the highway,** based upon counts and delay observations, are estimated to reduce capacity in Tahoe City by 2.8 percent.

- **Bicyclists traveling along the travel lanes** also tend to reduce roadway capacity, by causing drivers to hesitate or divert their travel path. This factor is estimated to reduce capacity in Tahoe City by 3 percent.

- **On-street parking maneuvers** impact roadway capacity, as a function of the number of spaces, the turnover rate of the spaces, and the time that traffic is interrupted as drivers enter and exit the spaces. Based on counts and observations made during peak summer conditions, this factor is estimated to reduce capacity in Tahoe City by 6.3 percent.

- **Searching for available on-street parking spaces** reduces capacity, as drivers tend to drive slower than otherwise, in order to avoid missing an available space. Counts conducted in Tahoe City indicate that 24 percent of all traffic entering on SR 28 is destined to the commercial core area. These drivers searching for parking tend to travel at approximately 20 miles per hour, which results in the entire traffic queue traveling at this speed under queued conditions. The Highway Capacity Manual indicates that the capacity of a roadway at 20 miles per hour is 21 percent below the capacity at 25 miles per hour.

- **Conflicting turning movements** also tend to reduce roadway capacity, as through drivers are delayed by left-turning drivers who do not fully pull into the center two-way left-turn lane, by right-turning drivers blocked by pedestrians or cyclists crossing the driveway, and by drivers entering the roadway that "force" their way into the traffic stream. Delays are often observed under queue conditions as through drivers politely wave drivers waiting on the side street into the traffic stream. This factor is estimated in Tahoe City to consume 15 percent of roadway capacity.

- Finally, in Tahoe City **truck loading and unloading activity** occurring in the center two-way left-turn lane sometimes causes additional delays (particularly from delivery trucks that are accessed on the side rather than the rear). This factor is estimated to result in a final reduction of 2 percent of capacity.

These various factors can be combined in a multiplicative fashion:

Total Reduction = (1 – 0.162) X (1 - 0.028) X (1 - 0.03) X (1-0.063) X (1 - 0.21) X (1 - 0.15) X (1 - 0.02)

= 0.512

These factors together are estimated to reduce westbound roadway capacity in Tahoe City by 51.2 percent. Applying this reduction to the "ideal" capacity of 1,500 vehicles per hour results in a capacity of 731, which calibrates well with the observed westbound capacity of 730. Applying the same methodology in the eastbound direction yields a capacity of 750.

It is next necessary to "calibrate" the capacity of a three-lane cross-section in Kings Beach against the observed capacity of a similar cross-section in Tahoe City. The capacity reduction impacts of many of these factors would be less in Kings Beach with a three-lane roadway than they are in Tahoe City. The lower levels of bicycle and pedestrian activity in Kings Beach result in lower capacity reductions than in Tahoe City. Similarly, the lower number of on-street parking spaces that would be available along each roadway segment results in less associated loss of capacity. For many roadway segments, the number of driveways is lower than in Tahoe City, resulting in a lower potential for turning-movement conflicts and associated loss in capacity. In addition, it can be expected that the higher number of side-street truck loading opportunities in Kings Beach would avoid the impact of loading activity found in Tahoe City. However, while the proportion of total traffic looking for parking is estimated (based on turning

movement volumes) to be lower in Kings Beach, it is still sufficient enough to reduce the overall speed of the traffic queue.

The impacts of these various factors was estimated for the three potential constraining roadway segments in Kings Beach between Secline Street and Fox Street, and multiplied by the ideal capacity of 1,500 vehicles per hour per lane. This analysis assumes that, if necessary, the limitations in on-street parking triggered by monitoring (as identified in the Kings Beach Commercial Core EIR/EIS/EIS) would be implemented. The critical segment in the eastbound direction was found to be the block between Secline Street and Deer Street with a capacity (adjusted to the count location) of 1,241 vehicles per hour. In the westbound direction, the critical segment is the block between Coon Street and Bear Street, with a capacity (adjusted to the count location) of 1,171 vehicles per hour.