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Davidon Homes (Park Ridge Subdivision #8846) Second Addendum to the Project Level EIR for FUA #2 Specific Plan City of Antioch, Contra Costa County, California

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SECTION 1: INTRODUCTION

This Addendum, checklist, and attached supporting documents have been prepared to determine whether and to what extent the Final Environmental Impact Report (1996 Final EIR) for the East Lone Tree Specific Plan (officially known as the Future Urbanization Area 2 East Lone Tree Specific Plan Area Project-Level EIR) remains sufficient to address the potential impacts of the proposed changes to the Park Ridge Subdivision Project (proposed project):

- Reconfiguration of the proposed Laurel Road/Treeline Way/"D" Lane intersection, and
- Removal of condition of approval #91 requiring construction of a signalized intersection at the above intersection, or
- Whether additional documentation is required under the California Environmental Quality Act (CEQA) (Pub. Resources Code, Section 21000, et seq.).

1.1 - Initial Study/Environmental Checklist

Pursuant to Public Resources Code Section 21166, and CEQA Guidelines Sections 15162 and 15164, subd. (a), the attached initial study/checklist has been prepared to evaluate the proposed project. The attached initial study/checklist uses the standard environmental checklist categories provided in Appendix G of the CEQA Guidelines, but provides answer columns for evaluation consistent with the considerations listed under CEQA Guidelines Section 15162, subd. (a).

1.2 - Environmental Analysis and Conclusions

CEQA Guidelines Section 15164, subd. (a) provides that the lead agency or a responsible agency shall prepare an addendum to a previously certified EIR or Negative Declaration (ND) if some changes or additions are necessary but none of the conditions described in CEQA Guidelines Section 15162 calling for preparation of a subsequent EIR or ND have occurred (CEQA Guidelines, Section 15164, subd. (a)).

An addendum need not be circulated for public review but can be included in or attached to the Final EIR or ND (CEQA Guidelines Section 15164, subd. (c)). The decision-making body shall consider the addendum with the Final EIR prior to making a decision on the project (CEQA Guidelines Section 15164, subd. (d)). An agency must also include a brief explanation of the decision not to prepare a subsequent EIR or ND pursuant to Section 15162 (CEQA Guidelines Section 15164, subd. (e)).

Consequently, once an EIR or ND has been certified for a project, no subsequent EIR or ND is required under CEQA unless, based on substantial evidence:

1. Substantial changes are proposed in the project which will require major revisions of the previous EIR [or ND] . . . due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;[1]

2. Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR [or ND] . . . due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or

3. New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the ND was adopted . . . shows any of the following:
   a) The project will have one or more significant effects not discussed in the previous EIR [or ND] or negative declaration;
   b) Significant effects previously examined will be substantially more severe than shown in the previous EIR [or ND];
   c) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or
   d) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR [or ND] would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative (CEQA Guidelines, Section 15162, subd. (a); see also Pub. Resources Code, Section 21166).

This addendum, checklist, and attached documents constitute substantial evidence supporting the conclusion that preparation of a supplemental or subsequent EIR or ND is not required prior to approval of the proposed project by the City of Antioch, and provides the required documentation under CEQA.

1.2.1 - Findings

As illustrated herein, the project is consistent with the 1996 Final EIR, and would involve only minor changes. There are no substantial changes proposed in the project or in the circumstances in which the project will be undertaken that require major revisions of the 1996 Final EIR, or preparation of a new subsequent or supplemental EIR or ND, due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.

1.2.2 - Conclusions

Based on the analysis contained in this Addendum, the Antioch Planning Commission or Antioch City Council may approve the Laurel Road/Treeline Way/"D" Lane intersection reconfiguration and

[1] CEQA Guidelines Section 15382 defines "significant effect on the environment" as ". . . a substantial, or potentially substantial adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance . . ." (see also Public Resources Code, Section 21068).

approve the removal of condition of approval #91 as part of the Park Ridge Subdivision Project. The impacts of the proposed project remain within the impacts previously analyzed in the 1996 Final EIR (CEQA Guidelines Section 15164).

The proposed project does not require any major revisions to the 1996 Final EIR. No new significant information or changes in circumstances surrounding the project have occurred since the certification of the EIR. The reconfiguration of the intersection would not result in new impacts that were not previously disclosed; and as evaluated in this addendum, the construction of a stop-controlled intersection rather than a signalized intersection would not result in new transportation impacts that were not previously disclosed. Therefore, the previous CEQA analysis completed for the Park Ridge Subdivision Project, which includes the proposed Laurel Road/Treeline Way/"D" Lane intersection, remains adequate. The applicable mitigation measures from the 1996 Final EIR will be imposed on the proposed project as described herein.

1.3 - Determination

CEQA allows the preparation of an addendum to a previously certified EIR if some changes or additions are made to the previous EIR and no conditions are present that would require the preparation of a subsequent EIR (PRC Section 21166, CEQA Guidelines Sections 15162, 15164). As explained throughout this Addendum and summarized below, no such conditions are present.

1.3.1 - Statement of Findings

1. Substantial changes are not proposed to the project that would require major revisions to the 1996 Final EIR, due to the involvement of new significant environmental effects or a substantial increase in the severity of a previously identified effect.
2. Substantial changes have not occurred with respect to the circumstances under which the project is undertaken requiring major revisions to the 1996 Final EIR, due to the involvement of new significant environmental effects or a substantial increase in the severity of a previously identified effect.
3. There is no new information of substantial importance which was not known and could not have been known at the time the 1996 Final EIR was certified showing any of the following:
   A. The project will have a new significant effect not previously discussed in the 1996 Final EIR.
   B. The project will not cause any significant effect examined in the 1996 Final EIR to be substantially more severe.
   C. The mitigation measures in the 1996 Final EIR and adopted in the CEQA Findings for the Project remain feasible. All mitigation measures identified in this Addendum and required for the proposed project as identified in the 1996 Final EIR that are necessary to reduce the potentially significant impacts to a level of insignificance will be made a requirement of the project and are acceptable by the project proponent.

1.3.2 - Evidence Supporting Findings

An updated Traffic Analysis was prepared as part of this Addendum to evaluate the changes in the traffic conditions in the vicinity of the project area since 1996. As explained in Section XVI Transportation, the proposed project will not cause any new significant traffic impacts or increase the severity of the traffic impacts already evaluated in the 1996 Final EIR and the subsequent 2009 Addendum. The reconfiguration of the Laurel Road/Treeline Road/"D" Lane intersection was evaluated in the 2016 Addendum to the 1996 Final EIR for the Laurel Ranch Subdivision, and those findings are presented in this Addendum. The analysis demonstrates that this intersection would operate satisfactorily as a non-signalized, stop-controlled intersection, and does not meet the warrant for signalization.

Additional analysis is also presented in Section XVI, Transportation, to describe the potential effects of the reconfiguration of the intersection of "Lane D" and Laurel Road on the proposed crossing of the Delta De Anza Trail at Laurel Road. No new impacts were identified related to the operation of the trail at this location.

All potential impacts that were known or could have been known were adequately analyzed in the 1996 Final EIR (aesthetics, light, and glare; air quality; biological resources; cultural resources; geology and soils; greenhouse gases; hazards and hazardous materials; hydrology and water quality; land use; mineral resources; noise; population and housing; public services; recreation; transportation; and utility systems).

As summarized above and explained throughout this Addendum, this Addendum is appropriate for the proposed project since (1) substantial changes are not proposed in the project which will require major revisions to the 1996 Final EIR, (2) there are no substantial changes with respect to the circumstances under which the project is being undertaken that would require major revisions to the 1996 Final EIR, and (3) there is no new information which was not known or could not have been known at the time the 1996 Final EIR was certified.

1.4 - Mitigation Monitoring and Reporting Program

As required by Public Resources Code Section 21081.6, subd. (a)(1), a mitigation monitoring and reporting program (MMRP) has been prepared for the project in order to monitor the implementation of the mitigation measures that have been adopted for the project. Any long-term monitoring of mitigation measures imposed on the overall development will be implemented through the MMRP.

SECTION 2: PROJECT DESCRIPTION

2.1 - Location and Setting

2.1.1 - Location

The project site is located in the City of Antioch, Contra Costa County, California (Exhibit 1). The project site is bounded by single-family residential uses (west and south), open space and an Oakley Water District elevated tank site and open space (north), and State Route 4 (SR-4) (east) (Exhibit 2). The project site is located on the Antioch, California 7.5-minute United States Geological Survey topographical quadrangle, Township 2 North, Range 2 East, Section 6 (Latitude 37° 58'48" North; Longitude 121° 44'24" West).

2.2 - Project Background

2.2.1 - East Lone Tree Specific Plan

In 1988, the Antioch City Council adopted a General Plan Update that designated a 785-acre area-which included the project site-as "Future Urban Area 2." The General Plan Update envisioned various urban uses in this area including business park, office, and light industrial; however, it did not set forth any development targets.

In 1992, the Infrastructure Plan Environmental Impact Report (EIR) identified a range of development potential for "Future Urban Area 2" that consisted of 227 to 313 acres of commercial and employment land uses, and 1,300 to more than 2,600 dwelling units. Future Urban Area 2 was annexed into the City of Antioch in two phases, one in 1993, and one in 1995.

In 1996, the City of Antioch adopted the East Lone Tree Specific Plan and certified the associated Final EIR (1996 Final EIR), officially known as "Future Urbanization Area 2 East Lone Tree Specific Plan Area Project-Level EIR." The Specific Plan contemplated the development of 1,322 dwelling units, regional retail uses, a school, and parks.

2.2.2 - Park Ridge Subdivision

The Park Ridge Subdivision #8846 consists of the subdivision and development of 169.7 acres within the Future Urbanization Area (FUA) #2 Specific Plan area, located between the State Route 4 Bypass and Canada Valley Road, south of Laurel Road. The project sponsor, Davidon Homes, proposes to develop a total of 525 single-family residential homes, and related public facilities. The project site adjoins existing or approved development to the west and south, and adjoins the State Route 4 Bypass to the east.

Development of the project, as proposed, includes a neighborhood park facility (8.22 acres), a major public open space preserve (25.5 acres) and the extension of Country Hills Drive along the east boundary of the site adjoining the State Route 4 Bypass, as called for in the Specific Plan.

An Addendum to the 1996 Final EIR was prepared and adopted for the Park Ridge Subdivision in 2009 (2009 Addendum) to address refinements to the land plan. The 2009 Addendum transportation analysis evaluated the need for a signalized intersection at the intersection of Laurel Road/Treeline Way/"D" Lane and found that the level of service and delay did not meet the warrant for signalization. However the City Council, in approving the project, included a condition of approval (#91) requiring the construction of a fully signalized intersection. The Park Ridge project, and related roadway improvements have not yet been constructed.

2.3 - Project Characteristics

2.3.1 - Project Summary

Stop-controlled intersection

The proposed intersection of Laurel Road/Treeline Way/"D" Lane would be located along the future extension of Laurel Road west of State Route 4, and would serve both Laurel Ranch Subdivision to the north, and Park Ridge Subdivision to the south as shown in Exhibit 3.

Exhibit 3 illustrates the proposed revised intersection configuration and traffic movements:

- From Treeline Way, the intersection would include right-in, right-out, and a left-in access from a left hand median turn pocket on Laurel Road.
- From "D" Lane, access would consist of right-in and right out only.

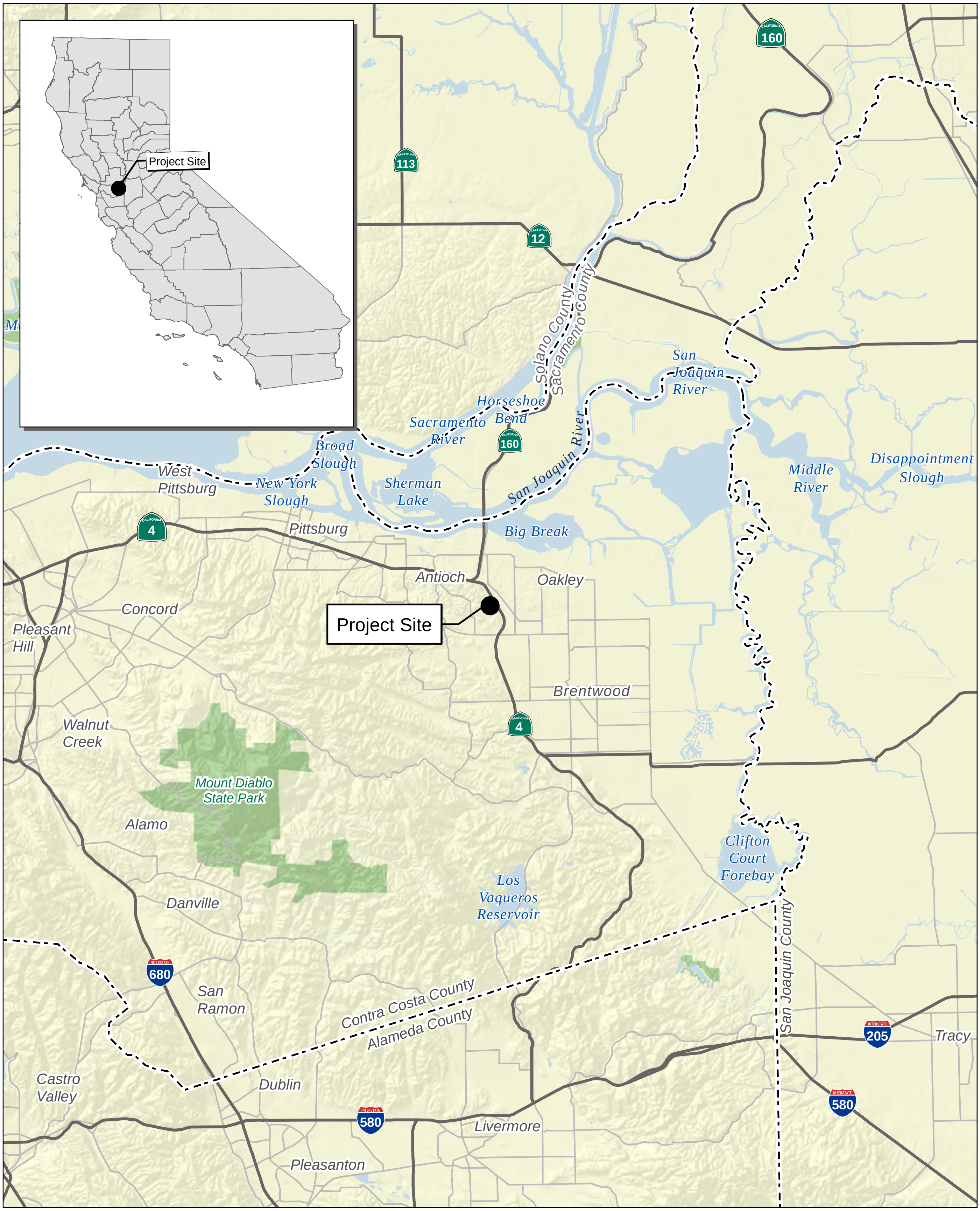
Recreational Trail Facilities

Both the Park Ridge and Laurel Ranch Subdivisions include construction of a connecting trail to the Delta De Anza Regional trail along their western boundaries. The trail would cross Laurel Road as shown in Exhibit 3. To ensure that pedestrians using the Delta De Anza Trail can cross Laurel Road safely, a pedestrian crossing will be installed just to the west of Treeline Way and "D" Lane, in general alignment with the proposed regional trail.

2.4 - Discretionary Approvals

The proposed project would require the following discretionary approval:

- Removal of the signalized intersection as a condition of approval for the Park Ridge Vesting Tentative Subdivision Map



Source: Census 2000 Data, The CaSIL, FCS GIS 2013.

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Exhibit 1
Regional Location Map

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Source: ESRI Imagery, 2014

1,000 500 0 1,000
Feet

Exhibit 2
Local Vicinity Map
Aerial Base

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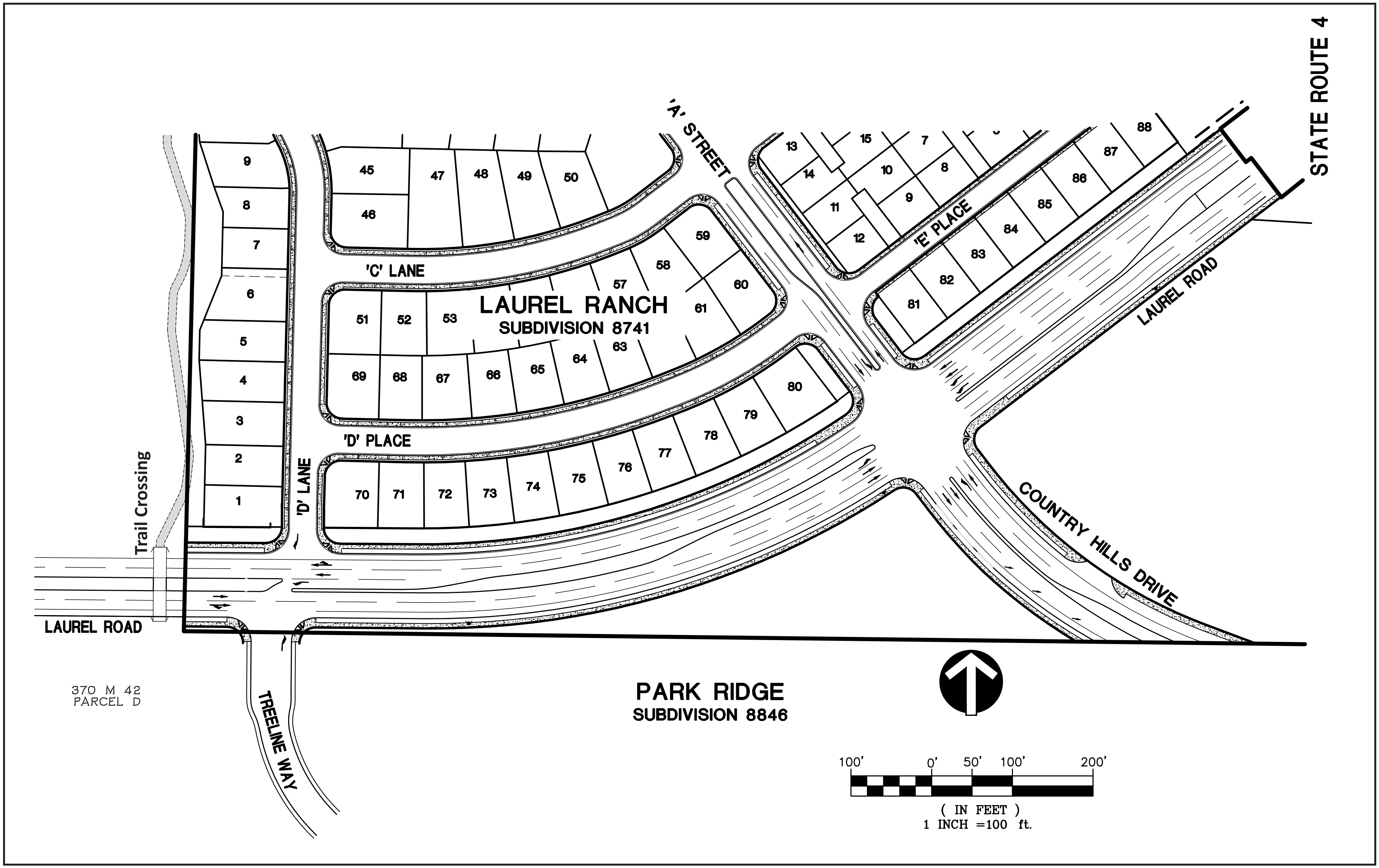

Source: DK Consulting, 2016

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Exhibit 3
Laurel Road Reconfiguration

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SECTION 3: CEQA CHECKLIST

The purpose of the checklist is to evaluate the categories in terms of any changed condition (e.g., changed circumstances, project changes, or new information of substantial importance) that may result in a changed environmental result (e.g., a new significant impact or substantial increase in the severity of a previously identified significant effect) (CEQA Guidelines Section 15162).

The questions posed in the checklist come from Appendix G of the CEQA Guidelines. A "no" answer does not necessarily mean that there are no potential impacts relative to the environmental category, but that there is no change in the condition or status of the impact since it was analyzed and addressed with mitigation measures in the 1996 Final EIR prepared for the project. These environmental categories might be answered with a "no" in the checklist, since the proposed project does not introduce changes that would result in a modification to the conclusion of the certified EIR.

3.1 - Explanation of Checklist Evaluation Categories

(1) Conclusion in Prior EIR and Related Documents

This column summarizes the conclusion of the EIR relative to the environmental issue listed under each topic.

(2) Do the Proposed Changes Involve New Impacts?

Pursuant to CEQA Guidelines Section 15162, subd. (a)(1), this column indicates whether the changes represented by the revised Project will result in new significant environmental impacts not previously identified or mitigated by the EIR, or whether the changes will result in a substantial increase in the severity of a previously identified significant impact.

(3) New Circumstances Involving New Impacts?

Pursuant to CEQA Guidelines Section 15162, subd. (a)(2), this column indicates whether there have been substantial changes with respect to the circumstances under which the Project is undertaken that will require major revisions to the EIR, due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.

(4) New Information Requiring New Analysis or Verification?

Pursuant to CEQA Guidelines Section 15162, subd. (a)(3)(A-D), this column indicates whether new information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the EIR was certified as complete, shows any of the following:

(A) The Project will have one or more significant effects not discussed in the previous EIR [or ND];

(B) Significant effects previously examined will be substantially more severe than shown in the previous EIR [or ND];

(C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the Project, but the project proponents decline to adopt the mitigation measure or alternative; or

(D) Mitigation measures or alternatives which are considerable different from those analyzed in the previous EIR [or ND] would substantially reduce one or more significant effect of the environment, but the project proponents decline to adopt the mitigation measure or alternative.

If the additional analysis completed as part of this environmental review were to find that the conclusions of the EIR remain the same and no new significant impacts are identified, or identified impacts are not found to be substantially more severe, or additional mitigation is not necessary, then the question would be answered "no" and no additional environmental document would be required.

(5) Mitigation Measures Implemented or Address Impacts

Pursuant to CEQA Guidelines Section 15162, subd. (a)(3), this column indicates whether the EIR provided mitigation measures to address effects in the related impact category. These mitigation measures will be implemented with the construction of the project, as applicable. If "NA" is indicated, both the 1996 Final EIR and this Initial Study/Addendum have concluded that the impact either would not occur with this project or would not be significant, and, therefore, no additional mitigation measures are needed.

3.2 - Discussion and Mitigation Sections

(1) Discussion

A discussion of the elements of the checklist is provided under each environmental category in order to clarify the answers. The discussion provides information about the particular environmental issue, how the project relates to the issue, and the status of any mitigation that may be required or that has already been implemented.

(2) Relevant Mitigation Measures

Applicable mitigation measures from the EIR that apply to the project are listed under each environmental category.

(3) Conclusions

A discussion of the conclusion relating to the analysis is contained in each section.

Environmental Issue Area	Conclusion in 1996 EIR	Do the Proposed Changes Involve New Impacts?	New Circumstances Involving New Impacts?	New Information Requiring New Analysis or Verification?	1996 EIR Mitigation Measures
XVI. Transportation					
Would the project:					
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	Less than significant after mitigation.	**No.** The proposed project does not involve changes that would result in new impacts on measures of effectiveness of transportation.	**No.** There are no new circumstances that would result in new or more severe impacts on measures of effectiveness of transportation.	**No.** No new information has been disclosed pertaining to the proposed project that would require additional analysis of measures of effectiveness of transportation.	B11, 12, 13
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.	Less than significant after mitigation.	**No.** The proposed project does not involve changes that would result in new impacts on public transit, bicycle, or pedestrian facilities.	**No.** There are no new circumstances that would result in new or more severe impacts on public transit, bicycle, or pedestrian facilities.	**No.** No new information has been disclosed pertaining to the proposed project that would require additional analysis of public transit, bicycle, or pedestrian facilities.	B11, 12, 13

Discussion and Mitigation

The intersection of Treeline Way and Laurel Road was evaluated by Fehr & Peers Transportation Consultants as part of the 2009 Addendum prepared for the Park Ridge Project.

W-Trans, a traffic engineering and transportation planning consultant, evaluated the reconfiguration of the intersection of “D” Lane and Laurel Road as part of an addendum prepared for the Laurel Ranch Project in 2016. Both of these analyses are summarized here to document the effect of the proposed reconfiguration of the intersection. The complete W-Trans Traffic Impact Analysis and Fehr & Peers Technical Memorandum are attached in Appendix A.

Would the project:

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

The 1996 Final EIR did not include specific analysis of the Laurel Road/Treeline Way intersection. As part of the 2009 Addendum for the Park Ridge Project, Fehr & Peers Transportation Consultants evaluated the operation of the side-street stop-controlled Laurel Road/Treeline Way intersection under Cumulative Plus Project conditions. The analysis concluded that the intersection would operate at level of service (LOS) F during the AM and PM peak hours, based on the HCM methodology. However, because the intersection serves low traffic volumes it would not meet the CA MUTCD peak-hour volume signal warrant. Thus, the proposed project would not cause an impact at this intersection because the significance criterion for unsignalized intersections requires the intersection to operate at an unacceptable LOS ***and*** satisfy the CA MUTCD peak-hour signal warrant. Based on this conclusion, the 2009 Addendum did not recommend any mitigation or signalization at this intersection. The City Council, in approving the Project, imposed a condition of approval (#91) requiring a signal at this location although it is not required based on the established CEQA significance criteria.

In 2016, the land owners for the Laurel Ranch Project, submitted a revised Final Tentative Map which moves the location of ”D” Lane to the east, offsetting it from Treeline Way, and making a signalized intersection infeasible. The Laurel Ranch Project proposes right in/right out access at “D” Lane.

It is now proposed that site access from Treeline Way would consist of a right-in, right-out, and a left-in from a left hand median turn pocket. Exhibit 3 illustrates the revised Laurel Road configuration and proposed traffic movements. As a result, condition of approval #91 is proposed to be revised as follows:

> A median on Laurel Road at Treeline Way shall be designed and constructed to allow for left turn ingress into the project and right turn only egress onto Laurel Road. A pedestrian crossing on Laurel Road, west of Treeline Way, and in general alignment with the proposed regional trail system, shall be constructed.

As part of the Laurel Ranch Addendum, W-Trans collected new traffic counts in September 2015 and evaluated project impacts based on the current unit counts for both the Laurel Ranch and Park Ridge Projects in the near term and cumulative scenarios. As discussed below, the project intersections would continue to operate acceptably. The intersection of Laurel Road/Treeline Way, as noted previously, would not meet the warrant for signalization, based on the low traffic volumes on Treeline Way.

Table 1 summarizes the trip generation associated with the Laurel Ranch Subdivision project. As shown in the table, the proposed project would generate 1,780 daily trips, 140 AM peak-hour trips, and 187 PM peak-hour trips. (Note: the traffic analysis was conducted using an earlier figure of 187 units so presents a more conservative analysis.)

Table 1: Trip Generation Summary

Land Use	Units	Daily		AM Peak Hour				PM Peak Hour			
		Rate	Trips	Rate	Trips	In	Out	Rate	Trips	In	Out
Proposed											
Single Family Detached Housing	187 du	9.52	1,780	0.75	140	35	105	1.00	187	118	69
Note: du = dwelling unit											

Intersection Operations

Intersection operations were evaluated based on the significance threshold established by the jurisdiction in which they are located or the agency that maintains them. The study area is located in the City of Antioch in Contra Costa County. The East County Regional Transportation Planning Committee, under the Contra Costa Transportation Planning Authority and in conjunction with local agencies, developed the Draft East County Action Plan for Routes of Regional Significance, which establishes objectives for arterial routes. Local agencies, such as the City of Antioch, have adopted the plan and resulting objectives.

In the study area, if one or more legs of the study intersection are ramps for SR-4, the intersection is maintained by Caltrans; otherwise, the intersection falls under the jurisdiction of the City of Antioch. For the intersection of Lone Tree Way/Empire Avenue, the jurisdiction is both the City of Antioch and the City of Brentwood. The Caltrans recommended target LOS is the transition from LOS C to D. The cities of Antioch and Brentwood have the recommended objective target of LOS D.

W-Trans evaluated the proposed project's impacts on intersection operations. Table 2 summarizes Existing (without project) Conditions and Existing Plus Project intersection operations. Note that the Existing Plus Project scenario accounts for the planned extension of Laurel Road from the SR-4 interchange to its current terminus west of the project site, while the Existing Conditions scenario does not. As shown in the table, all intersections would operate at acceptable LOS. Therefore, impacts would be less than significant, and would remain the same or less than those identified in the 1996 Final EIR.

Table 2: Existing and Existing Plus Project Intersection Operations

Study Intersection *Approach*	Existing Conditions				Existing plus Project			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. SR-4 WB Ramps/Hillcrest Ave	7.7	A	8.0	B	7.7	A	8.0	B
2. SR-4 EB Ramps/Hillcrest Ave	26.5	C	25.5	C	26.6	C	25.5	C
3. Hillcrest Rd/Laurel Rd	10.4	B	8.5	A	13.7	B	12.9	A
4. Laurel Rd/Canada Valley Rd	—	—	—	—	9.1	A	8.0	A
5. SR-4 EB Ramps/Laurel Rd	1.4	A	1.0	A	7.8	A	14.4	B
6. SR-4 WB Ramps/Laurel Rd	9.5	A	15.4	B	21.0	C	30.9	C
7. SR-4 EB Ramps/Lone Tree Way	14.7	B	16.3	B	14.7	B	16.3	B
8. SR-4 WB Ramps/Lone Tree Way	8.2	A	10.8	B	8.3	A	10.9	B
9. Lone Tree Way/Empire Ave	15.2	B	18.8	B	15.3	B	18.9	B
10. Laurel Rd/Country Hills Dr	—	—	—	—	4.5	A	4.7	A

Notes:
Delay is measured in average seconds per vehicle
LOS = Level of Service

Table 3 summarizes Cumulative (without project) Conditions and Cumulative Plus Project intersection operations. The Cumulative Conditions represent the projected traffic conditions in the year 2040. This includes the completion of all seven phases of the Park Ridge project as well as the completion of any proposed roadway infrastructure improvements in the study area. Note that both scenarios account for the planned extension of Laurel Road from the SR-4 interchange to its current terminus west of the project site. While the intersections of SR-4 Eastbound Ramps/Hillcrest Avenue and SR-4 Eastbound Ramps/Lone Tree Way would still operate below the desired Caltrans threshold, the intersections would continue to operate acceptably, based on the East County Action Plan. Therefore, impacts would be less than significant, and would remain the same or less than those identified in the 1996 Final EIR.

Table 3: Cumulative and Cumulative Plus Project Intersection Operation

Study Intersection *Approach*	Cumulative Conditions				Cumulative plus Project			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. SR-4 WB Ramps/Hillcrest Ave	—	—	—	—	—	—	—	—
2. SR-4 EB Ramps/Hillcrest Ave	13.9	B	**51.0**	**D**	13.9	B	**51.0**	**D**
3. Hillcrest Rd/Laurel Rd	**68.8**	**E**	**107.3**	**F**	**71.6**	**E**	**108.9**	**F**

Table 3 (cont.): Cumulative and Cumulative Plus Project Intersection Operation

Study Intersection *Approach*	Cumulative Conditions				Cumulative plus Project			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
4. Laurel Rd/Canada Valley Rd	19.6	B	43.7	D	19.9	B	45.4	D
5. SR-4 EB Ramps/Laurel Rd	17.4	B	25.4	C	18.8	B	30.3	C
6. SR-4 WB Ramps/Laurel Rd	15.8	B	21.4	C	17.3	B	23.0	C
7. SR-4 EB Ramps/Lone Tree Way	30.2	C	**49.7**	**D**	30.3	C	**49.7**	**D**
8. SR-4 WB Ramps/Lone Tree Way	13.4	B	21.2	C	13.4	B	21.3	C
9. Lone Tree Way/Empire Ave	18.6	B	27.4	C	18.6	B	27.5	C
10. Laurel Rd/Country Hills Dr	20.3	C	13.9	B	37.6	D	23.2	C
11. Laurel Rd/Slatten Ranch Rd	30.6	C	**55.9**	**E**	30.9	C	**57.0**	**E**

Notes:
Delay is measured in average seconds per vehicle
LOS = Level of Service; **Bold** text = deficient operation

Reconfiguration of Laurel Road/Treeline Way (Proposed Project)

As part of the Davidon Homes (Park Ridge Subdivision) Addendum to the Project Level EIR, the intersection of D Lane-Treeline Way/Laurel Road had no turning movement restrictions and was analyzed with stop-controlled side streets. Based on the significance criterion for unsignalized intersections, it did not meet this signal warrant and as such would not result in a significant impact.

It was determined that if the intersection were to be signalized, it would operate at an acceptable LOS. This traffic analysis and the following queueing analysis demonstrate that there would be no additional traffic impacts from the proposed design of this intersection with no signalization.

The project was analyzed as depicted in Exhibit 3, in which the Laurel Road median would be designed to allow westbound left turns into the Park Ridge project directly to the south of D Lane. The queuing analysis, shown in Table 4 for the proposed left-turn pocket indicated that there would be sufficient length to accommodate the projected queues from the Park Ridge Project.

Table 4: Queuing Summary

Intersection *Approach*	Estimated Available Storage	95th Percent Queues			
		AM Peak Hour		PM Peak Hour	
		C	C+P	C	C+P
Laurel Rd/D Lane					
WB Left-Turn	200*	36	52	75	68
Notes: 95th Percent Queue based on the calculated potential from five averaged SIMTRAFFIC runs * = Estimates of storage length based on potential space according to site plan, measured in feet C = Cumulative Conditions; C+P = Future plus Project Conditions					

According to the queuing calculations, there would be adequate space in the proposed Laurel Road median to incorporate a left-turn pocket at the intersection of Laurel Road and D Lane (Treeline Way). (While the median can accommodate a storage length of approximately 200 feet, the queuing calculations indicate that the storage length could be shorter, if desired). Impacts would be less than significant from queuing at the study intersection, including the new design of the intersection of Laurel Road and D Lane (Treeline Way) allowing westbound left turns from Laurel Road into Treeline Way, and impacts would remain the same or less than those identified in the 1996 Final EIR.

f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

For the 1996 Final EIR, pedestrian or bicycle paths had not yet been specified for the project, but incorporation of the Mitigation B11, 12, and 13 has resulted in adequate bike and pedestrian connections.

Sidewalks would be installed along Laurel Road and along the internal streets as shown in Exhibit 3.

To improve connectivity with the other nearby trail networks, particularly the Delta De Anza trail located just north of the Laurel Ranch project, the internal trail from the Park Ridge Subdivision would cross Laurel Road west of the Treeline Way intersection (Exhibit 3). The crossing would include striping on the pavement to identify the crossing for motorists and a pedestrian crossing signal light.

There would be no impacts beyond those identified in the 1996 Final EIR.

Relevant Mitigation Measures

The following mitigation measures from the 1996 Final EIR are implemented by the proposed project.

MM B11, B12, B13 Intersections, roadways, sidewalks and bike lanes will be designed in subsequent plans to meet City standards.

Conclusion

The conclusions from the 1996 Final EIR remain unchanged when considering the proposed revisions to condition of approval #91 and the development of the proposed project.

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SECTION 4: REFERENCES

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Appendix A:
Traffic Impact Analyses

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A.1 - 2016 Traffic Impact Analysis prepared by W-Trans for the Laurel Ranch Subdivision Addendum

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W-Trans

Transportation Impact Analysis for Laurel Ranch

Prepared for the City of Antioch

Submitted by
W-Trans

December 15, 2015

Table of Contents

Appendices

A. CCTA 2010 HCM Methodology
B. Intersection Level of Service Calculations
C. Project Driveway Queuing Calculations
D. Alternative Access Calculations
E. Sight Distance

Executive Summary

The proposed Laurel Ranch subdivision would result in the construction of 187 single family dwellings. The anticipated trip generation averages 1,780 trips per day, including 140 a.m. peak hour trips and 187 trips during the p.m. peak hour.

All analysis was conducted in accordance with the guidelines set forth by Caltrans, the Contra Cost Transit Authority (CCTA), the East County Action Plan, and the General Plans for the Cities of Antioch and Brentwood. The study area includes eleven intersections. All the study intersections are located along routes of regional significance, or "suburban arterial routes" according to the East County Action Plan. As such the corresponding Multimodal Transportation Service Objectives (MTSOs) for the intersections were evaluated.

The project site would be located west of State Route (SR) 4 and north of the future Laurel Road extension, from which access would be taken, on an undeveloped site. Extension of Laurel Road and associated nearby improvements were assumed to be completed in conjunction with the project.

Analysis of the currently existing study intersections indicate they are operating acceptably under Existing conditions. With the addition of project-generated Laurel Ranch subdivision trips, including the planned roadway modifications, all study intersections analyzed would be expected to operate acceptably.

Under the Existing plus Nearby Future Projects scenario, project trips from Phase 1 of the nearby Park Ridge Subdivision were added. With the addition of the Laurel Ranch project trips and associated roadway improvements, the study intersections analyzed would be expected to continue operating acceptably according to the standards set forth by the regulating agencies.

Under the Cumulative No Project scenario, including several roadway improvements, several study intersections are expected to operate deficiently based on the projected growth from the area. For the intersections projected to be operating deficiently in the future, the delay added from the addition of the project trips would be minimal and within the threshold set forth by the City; no significant cumulative impacts are therefore anticipated.

Vehicles would access the project via the signalized Laurel Road/Country Hills Drive intersection and the stop-controlled access road at D Lane. Only right turns in and out of the driveway would be allowed at D Lane as there is a median restricting left turns. A queuing analysis for the two project driveways, with lengths as shown in the site plan, indicated that sufficient storage space is available for the projected queues.

As part of the *Davidon Homes (Park Ridge Subdivision) Addendum to the Project Level EIR*, the intersection of D Lane-Treeline Way/Laurel Road had no turning movement restrictions and was analyzed with stop-controlled side streets. Based on the significance criterion for unsignalized intersections, it did not meet this signal warrant and as such would not result in a significant impact. It was determined that if the intersection were to be signalized it, it would operate at an acceptable level of service.

An alternative access was analyzed in which the Laurel Road median would be modified to allow westbound left turns into the Park Ridge project directly to the south of D Lane. The queuing analysis for the proposed left-turn pocket indicated that there would be sufficient length to accommodate the projected queues from the Park Ridge Project.

Pedestrian, bicycle, and transit facilities would be provided along the project frontage. These include sidewalks, bike lanes, and eastbound and westbound Tri Delta Transit bus stops. With the completion of the project and the extension of Laurel Road, it is recommended that the sidewalks be constructed to connect with the existing network. Also, landscaping maintenance would be required at D Lane to maintain a clear line of site for motorists existing D Lane onto Laurel Road.

Introduction

This report presents an analysis of the potential transportation impacts that would be associated with occupation of the proposed Laurel Ranch Housing Development, consisting of 187 single family homes, to be located in the currently unoccupied area north of the future Laurel Road connection in the City of Antioch. The transportation impact study was completed in accordance with the criteria established by the California Department of Transportation (Caltrans), the Contra Costa Transit Authority (CCTA), and the City of Antioch, as found in the East County Action Plan, and it is consistent with standard traffic engineering techniques.

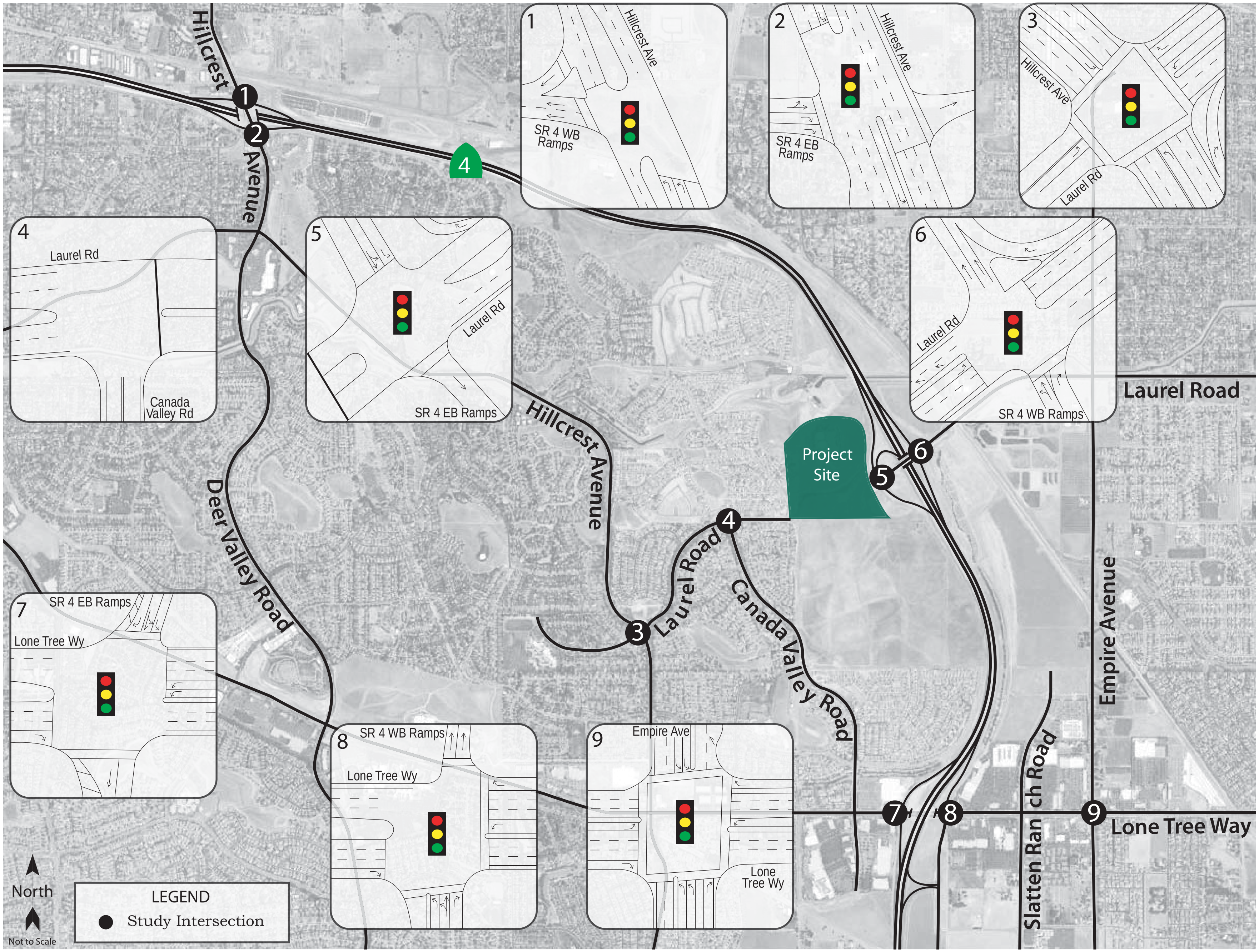
Prelude

The purpose of a transportation impact study is to provide City of Antioch staff and policy makers with data that they can use to make an informed decision regarding the potential impacts of the Laurel Ranch project, and any associated improvements that would be required in order to mitigate these impacts to a level of insignificance as defined by the City of Antioch's General Plan, CCTA guidelines, or other policies. Vehicular traffic impacts are typically evaluated by determining the number of new trips that the proposed use would be expected to generate, distributing these trips to the surrounding street system based on existing travel patterns or anticipated travel patterns specific to the proposed project, then analyzing the impact the new traffic would be expected to have on critical intersections or roadway segments. Impacts relative to access for pedestrians, bicyclists, and to transit are also addressed.

Project Profile

The proposed Laurel Ranch Subdivision has been through several iterations. The City has been planning to convert the former agricultural land into residential uses for several decades. Following the most recent addendum to the Laurel Ranch Subdivision, the project as proposed has a reduced unit count.

The project site as proposed would allow for the development of 187 single family homes on the undeveloped agricultural land. The site is located west of the newly constructed SR 4 Bypass and north of the future Laurel extension and north of the future Laurel Road/Country Hills Drive intersection, as shown in Figure 1.



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Transportation Impact Analysis for Laurel Ranch

Figure 1 – Study Area and Existing Lane Configurations

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Transportation Setting

Operational Analysis

Study Area and Periods

The study area consists of the following intersections:

1. State Route (SR) 4 Westbound Ramps/Hillcrest Avenue
2. SR 4 Eastbound Ramps/Hillcrest Avenue
3. Hillcrest Road/Laurel Road
4. Laurel Road/Canada Valley Road
5. SR 4 Eastbound Ramps/Laurel Road
6. SR 4 Westbound Ramps/Laurel Road
7. SR 4 Eastbound Ramps/Lone Tree Way
8. SR 4 Westbound Ramps/Lone Tree Way
9. Lone Tree Way/Empire Avenue
10. Laurel Road/County Hills Drive[1]
11. Laurel Road/Slatten Ranch Road

Operating conditions during the a.m. and p.m. peak periods were evaluated to capture the highest potential impacts for the proposed project as well as the highest volumes on the local transportation network. The morning peak hour occurs between 7:00 and 9:00 a.m. and reflects conditions during the home to work or school commute, while the p.m. peak hour occurs between 4:00 and 6:00 p.m. and typically reflects the highest level of congestion during the homeward bound commute.

Study Intersections

SR 4 Westbound Ramps/Hillcrest Avenue, as of the time of this study, is a signalized tee-intersection with protected left-turn phasing for the eastbound direction. The west leg is the on-ramp for westbound SR 4 and the location of the only crosswalk.

SR 4 Eastbound Ramps/Hillcrest Avenue is a four-legged intersection with protected left-turn phasing. The west and east legs are the off- and on-ramps, respectively, for eastbound SR 4 and the location of the only crosswalks at the intersection.

Hillcrest Road/Laurel Road is a four-legged intersection with protected left-turn phasing on Hillcrest Avenue and permitted left-turn phasing on Laurel Road. The northbound right turn is channelized and yield-controlled.

Laurel Road/Canada Valley Road, as of the time of the study, is a tee-intersection only open to vehicular traffic on the west leg of Laurel Road and the south leg of Canada Valley Road. As such, the intersection is unsignalized with no conflicting movements.

SR 4 Eastbound Ramps/Laurel Road, at the time of the study, is a tee-intersection. In the area, SR 4 is directionally more north-south than east-west. The west leg of Laurel Road has yet to be completed. The north and south leg

[1] Future Intersections

of the intersection are the off- and on-ramps, respectively, for eastbound SR 4. The westbound right-turn lane leads to a cloverleaf on-ramp onto SR 4 East about 400 feet east of the intersection.

SR 4 Westbound Ramps/Laurel Road is a four-legged intersection with the north and south legs as the on- and off-ramps, respectively, for westbound SR 4. All left turns have protected left-turn phases.

SR 4 Eastbound Ramps/Lone Tree Way is a four-legged intersection with protected left-turn phasing on all inbound approaches. The north leg is the off-ramp for eastbound SR 4 and the south leg is the on-ramp. There are pedestrian crossings provided on the north and south leg.

SR 4 Westbound On-Ramps-Jeffery Way/Lone Tree Way is a four-legged intersection with protected left-turn phasing on inbound approaches. The north leg is the SR 4 on-ramp.

Lone Tree Way/Empire Avenue is a four-legged intersection with protected left-turn phasing all around. U-Turns are allowed at every approach. There are crosswalks on every approach.

The locations of the study intersections and the existing lane configurations and controls are shown in Figure 1.

Analysis Methodology

Intersection Level of Service Methodologies

In accordance with the Contra Costa Transportation Authority's (CCTA) *Technical Procedures*, 2013, the study intersections were analyzed using methodologies published in the *Highway Capacity Manual* (HCM), Transportation Research Board, 2010. This source contains methodologies for various types of intersection control, all of which are related to a measurement of delay in average number of seconds per vehicle. In addition, the intersections in the study area were evaluated following the CCTA "Guidelines for Use of the *2010 Highway Capacity Manual* Operational Method Methodology."

The Levels of Service for intersections controlled by a traffic signal were evaluated using the signalized methodology from the HCM. This methodology is based on factors including traffic volumes, green time for each movement, phasing, whether or not the signals are coordinated, truck traffic, and pedestrian activity. Average stopped delay per vehicle in seconds is used as the basis for evaluation in this LOS methodology. Detailed methodology assumptions applied to the operational analysis are provided Appendix A.

The LOS for the intersections with side street stop controls were analyzed using the "Two-Way Stop-Controlled" intersection capacity method from the *Highway Capacity Manual* (HCM), Transportation Research Board, 2010. This methodology determines a level of service for each minor turning movement by estimating the level of average delay in seconds per vehicle. Results are presented for individual movements together with the weighted overall average delay for the intersection. The ranges of delay associated with the various stop-controlled levels of service are indicated in Table 1.

Table 1 – Signalized Intersection Level of Service Criteria	
LOS A	Delay of 0 to 10 seconds. Most vehicles arrive during the green phase, so do not stop at all.
LOS B	Delay of 10 to 20 seconds. More vehicles stop than with LOS A, but many drivers still do not have to stop.
LOS C	Delay of 20 to 35 seconds. The number of vehicles stopping is significant, although many still pass through without stopping.
LOS D	Delay of 35 to 55 seconds. The influence of congestion is noticeable, and most vehicles have to stop.
LOS E	Delay of 55 to 80 seconds. Most, if not all, vehicles must stop and drivers consider the delay excessive.
LOS F	Delay of more than 80 seconds. Vehicles may wait through more than one cycle to clear the intersection.

Reference: *Highway Capacity Manual*, Transportation Research Board, 2010

Regulatory Setting

Caltrans

Caltrans has set forth guidelines for traffic operations based on measures of effectiveness (MOEs) for varying State Highway facilities. In general, Caltrans recommends a target LOS at the transition between LOS C and LOS D. If the existing location operates worse than the target LOS, then the existing LOS should be maintained.

Contra Costa Transportation Authority

The CCTA has established Multimodal Transportation Service Objectives (MTSO) to maintain county-wide connectivity. Under CCTA, the East County Regional Transportation Planning Committee (RTPC) worked closely with local jurisdictions to develop the *Draft East County Action Plan for Routes of Regional Significance* (TRANSPLAN, 2014) in which the committee selects the MTSOs to be applied to the planning area. For this study, each of the intersections are located along suburban arterial routes, or Routes of Regional Significance. In the proposed project study area, these routes are Hillcrest Avenue, Laurel Road, and Lone Tree Way. The corresponding MTSO used in accordance with the planning area is "Signalized Intersection LOS."

City of Antioch

The City of Antioch, in General Plan Growth Management Policy 3.4.1.1, has adopted the routes of regional significance standards set forth for by the East County Action Plan. This threshold is detailed below:

- Maintain an LOS D or better at all signalized intersection.
- Within Priority Development Areas, any physical improvement identified as a result of applying the above standard shall be evaluated for its effects on all intersection users, including pedestrians, cyclists, and transit users.

In addition, the following standard was used in the nearby project, *Davidon Homes (Park Ridge Subdivision #8846) Addendum to the Project Level EIR for FUA #2 Specific Plan (2009):*

- A significant impact occurs if the average delay at an intersection operating at an unacceptable level (LOS E or F) increases by more than 5 seconds (2003 General Plan EIR).

City of Brentwood

The City of Bentwood, located south of Antioch, has jurisdiction over the study intersections on Lone Tree Way. In General Plan Circulation Policy 2.1-4, the City of Brentwood has also adopted the routes of regional significance standards set forth in the Action Plan.

- Maintain an LOS D or better at all signalized intersection.

Summary of Applicable Standards

The traffic operations analysis included 11 key study intersections. Table 2 provides a summary of each study intersection, its control type, and the respective applicable standard.

Table 2 – Level of Service Standards			
Intersection	**Control Type**	**Jurisdiction**	**LOS Standard**
1. SR 4 WB Ramps/Hillcrest Ave	Signal	Caltrans	C/D*
2. SR 4 EB Ramps/Hillcrest Ave	Signal	Caltrans	C/D*
3. Hillcrest Rd/Laurel Rd	Signal	City of Antioch	LOS D
4. Laurel Rd/Canada Valley Rd	Uncontrolled/Signal**	City of Antioch	LOS D
5. SR 4 EB Ramps/Laurel Rd	Signal	Caltrans	C/D*
6. SR 4 WB Ramps/Laurel Rd	Signal	Caltrans	C/D*
7. SR 4 EB Ramps/Lone Tree Way	Signal	Caltrans	C/D*
8. SR 4 WB Ramps/Lone Tree Way	Signal	Caltrans	C/D*
9. Lone Tree Way/Empire Ave	Signal	Cities of Antioch and Brentwood	LOS D
10. Laurel Rd/Country Hills Dr	Signal	City of Antioch	LOS D
11. Laurel Rd/Slatten Ranch Rd	Signal	City of Antioch	LOS D

Notes LOS= Level of Service; * = Caltrans target LOS is the transition between LOS C and D; ** = depending on the scenario analyzed and whether the Laurel Road Connection is completed, the intersection is either uncontrolled, and not analyzed, or signalized

Alternative Modes

Pedestrian Facilities

Pedestrian facilities include trails/paths, sidewalks, crosswalks, pedestrian signal phases, curb ramps, curb extensions, and various streetscape amenities such as lighting, benches, etc. In general, a network of sidewalks, crosswalks, pedestrian signals, and curb ramps provide access for pedestrians in the vicinity of the proposed project site where development exists; however, where there is no development, like the connection of Laurel Road, there are sidewalk gaps, obstacles, and barriers can be found adjacent to the project site. Between the location of the proposed project site and the adjacent development to the west there exists a public trail that provides connectivity with the Delta De Anza Regional Trail which provides access between the Cities of Pittsburg/Bay Point and the City of Oakley.

At the future adjacent intersection of SR 4 Eastbound Ramps/Laurel Road, there are currently no sidewalks provided on the north side of Laurel Road from the existing westerly terminus to just east of the westbound channelized right-turn.

Bicycle Facilities

The *Highway Design Manual*, Caltrans, 2012, classifies bikeways into three categories:

- **Class I Multi-Use Path** – a completely separated right-of-way for the exclusive use of bicycles and pedestrians with cross flows of motorized traffic minimized.

- **Class II Bike Lane** – a striped and signed lane for one-way bike travel on a street or highway.

- **Class III Bike Route** – signing only for shared use with motor vehicles within the same travel lane on a street or highway.

In the project area, there are Class II bike lanes on the existing portions of Laurel Road and on Hillcrest Avenue between the Davison Drive-Deer Valley Road/Hillcrest Avenue intersection and the existing southern terminus. As mentioned previously, just north of the project site is the multi-use Delta de Anza Regional Trail.

Transit Facilities

Tri Delta Transit

Tri Delta Transit (TDT) provides fixed route bus service in the Cities of Antioch, Brentwood, Oakley, Bay Point, Pittsburg, Discovery Bay, and Concord. Route 380, which is the closest to the project site, has its nearest stop approximately 0.5 miles from the proposed project. TDT Route 380 provides weekday service to destinations from the Pittsburg/Bay Point Bart Station to the Tri Delta Transit Center in the City of Oakley. Headways range from 30 minutes to an hour depending on the time of day. The Eastbound Route operates from 4:00 a.m. to 11:30 p.m. and the Westbound Route operates from 3:00 a.m. to 11:00 p.m.

Within a mile of the proposed project site, at the intersection of Hillcrest Avenue and Laurel Road, there are stops for Routes 385 and 392. Route 385 is weekday route providing service between the Antioch Park and Ride, Heritage High School, John Muir Medical Center, and the Brentwood Park-and-Ride. Route 392 is a weekend service that provides service to The Pittsburg Bay Point Station and other park-and-rides.

Two bicycles can be carried on most TDT buses. Bike rack space is on a first come, first served basis. Additional bicycles are allowed on the buses at the discretion of the driver.

Dial-a-ride, also known as paratransit, or door-to-door service, is available for those who are unable to independently use the transit system due to a physical or mental disability. Tri Delta Paratransit is designed to serve the needs of individuals with disabilities within the Eastern Contra Costa County.

County Connections

County Connection Transit provides one regional route to the Hillcrest Park-and-Ride lot, which is the Route 93X identified as the Kirker Pass Express route. The route operates during commute hours with headways ranging from 30 to 60 minutes and provides access to the Walnut Creek Bart Station.

Bart Extension/Bay Area Rapid Transit

Bart Extension (eBART) is a park-and-ride service located on the future site of the Antioch BART Station. eBART is located north of SR 4 and East of Hillcrest Avenue. Tri Delta Transit provides direct routes from the park–and- ride to the nearest BART station, Pittsburg/Bay Point. In addition, the Antioch park-and-ride lot has a dozen other routes that use the facilities.

The Bay Area Rapid Transit District (BART) provides heavy-rail rapid transit service within Alameda, Contra Costa, San Francisco and San Mateo Counties. The future Hillcrest Antioch Station, located in the median of SR 4, will be approximately three miles from the proposed project site. One BART line would provide service from the existing Pittsburg/Bay Point station to the proposed terminating Antioch Station to the north. Connecting services will terminate in Richmond, Dublin-Pleasanton, Fremont, and Millbrae-San Francisco International Airport.

Capacity Analysis

Existing Conditions

The Existing Conditions scenario provides an evaluation of current operation based on existing traffic volumes during the a.m. and p.m. peak periods. Turning movement counts were collected at the study intersections on September 22, 2015 when nearby schools were in session.

The roadway geometries can be seen in Figure 1. This condition does not include project-generated traffic volumes.

Intersection Levels of Service

Under existing conditions, all intersections operate within an acceptable level of service. While the two-legged intersection of Laurel Road/Canada Valley Road has vehicles using it, there are no conflicting movements, so the intersection operates freely with no delay. As an uncontrolled intersection, it was therefore not analyzed. The existing traffic volumes are shown in Figure 2. A summary of the intersection level of service calculations is contained in Table 3, and copies of the Level of Service calculations are provided in Appendix B.

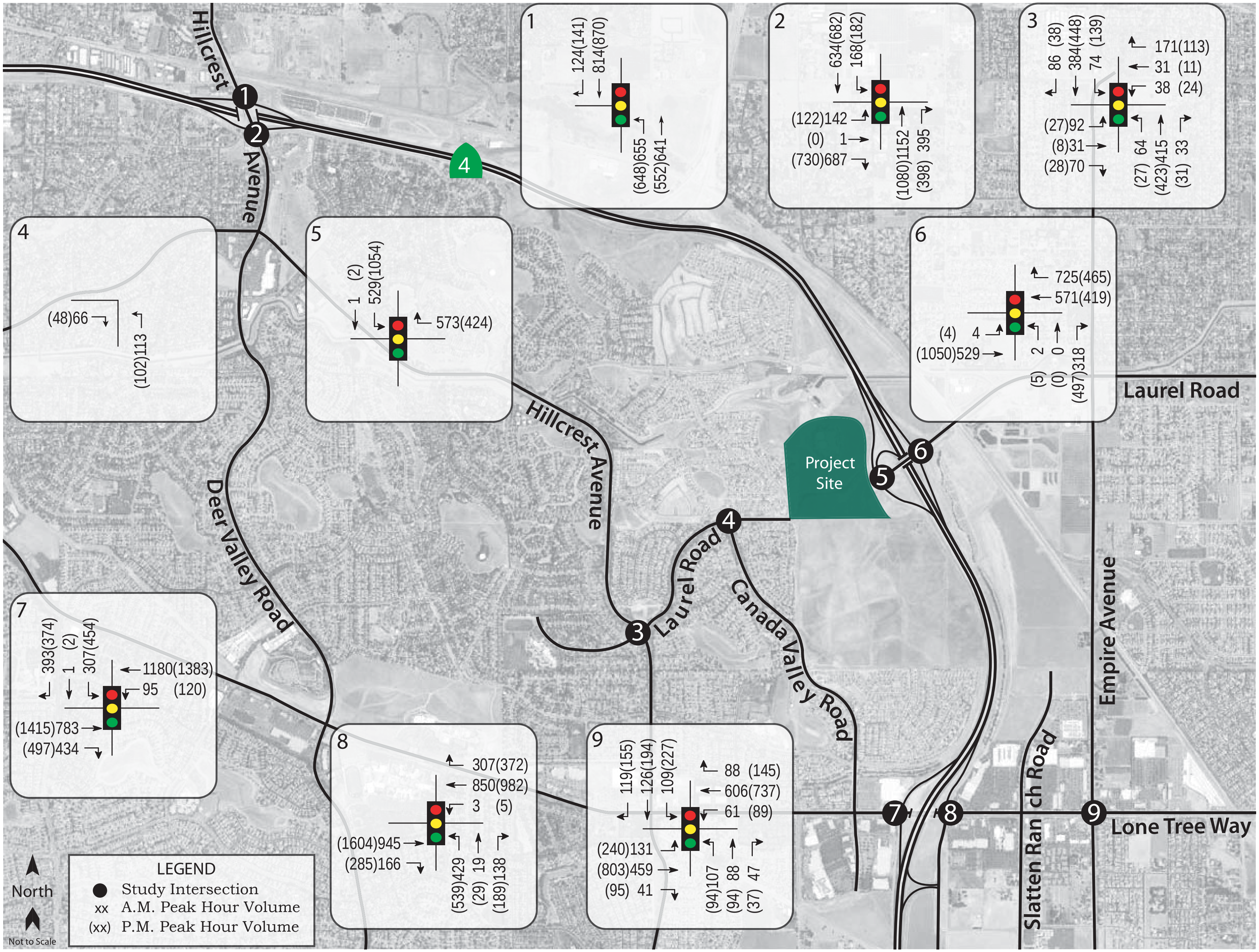
Table 3 – Existing Peak Hour Intersection Levels of Service

Study Intersection *Approach*	**AM Peak**		**PM Peak**	
	Delay	**LOS**	**Delay**	**LOS**
1. SR 4 WB Ramps/Hillcrest Ave	7.7	A	8.0	B
2. SR 4 EB Ramps/Hillcrest Ave	26.5	C	25.5	C
3. Hillcrest Rd/Laurel Rd	10.4	B	8.5	A
4. Laurel Rd/Canada Valley Rd*	-	-	-	-
5. SR 4 EB Ramps/Laurel Rd	1.4	A	1.0	A
6. SR 4 WB Ramps/Laurel Rd	9.5	A	15.4	B
7. SR 4 EB Ramps/Lone Tree Way	14.7	B	16.3	B
8. SR 4 WB Ramps/Lone Tree Way	8.2	A	10.8	B
9. Lone Tree Way/Empire Ave	15.2	B	18.8	B

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; * = uncontrolled intersection under construction

Existing Plus Nearby Future Projects

Short-term operating conditions were determined with traffic from phase one of the *Davidon Homes (Park Ridge Subdivision #8846) Addendum to the Project Level EIR for FUA #2 Specific Plan (2009)* added to the existing volumes. The project as planned would be completed in seven phases and include 525 homes. Only Phase One of the project was used for the near-term analysis and includes 123 single family dwellings to be built on the southern portion of the project site, connecting to several existing roads, including Canada Valley Drive. Under this condition, the assumptions for road geometries and distributions from the Park Ridge study were used; the extension of Laurel Road was assumed to be unconstructed. These results are summarized in Table 4, and Short-Term volumes are shown in Figure 3.



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Transportation Impact Analysis for Laurel Ranch

Figure 2 – Existing Traffic Volumes

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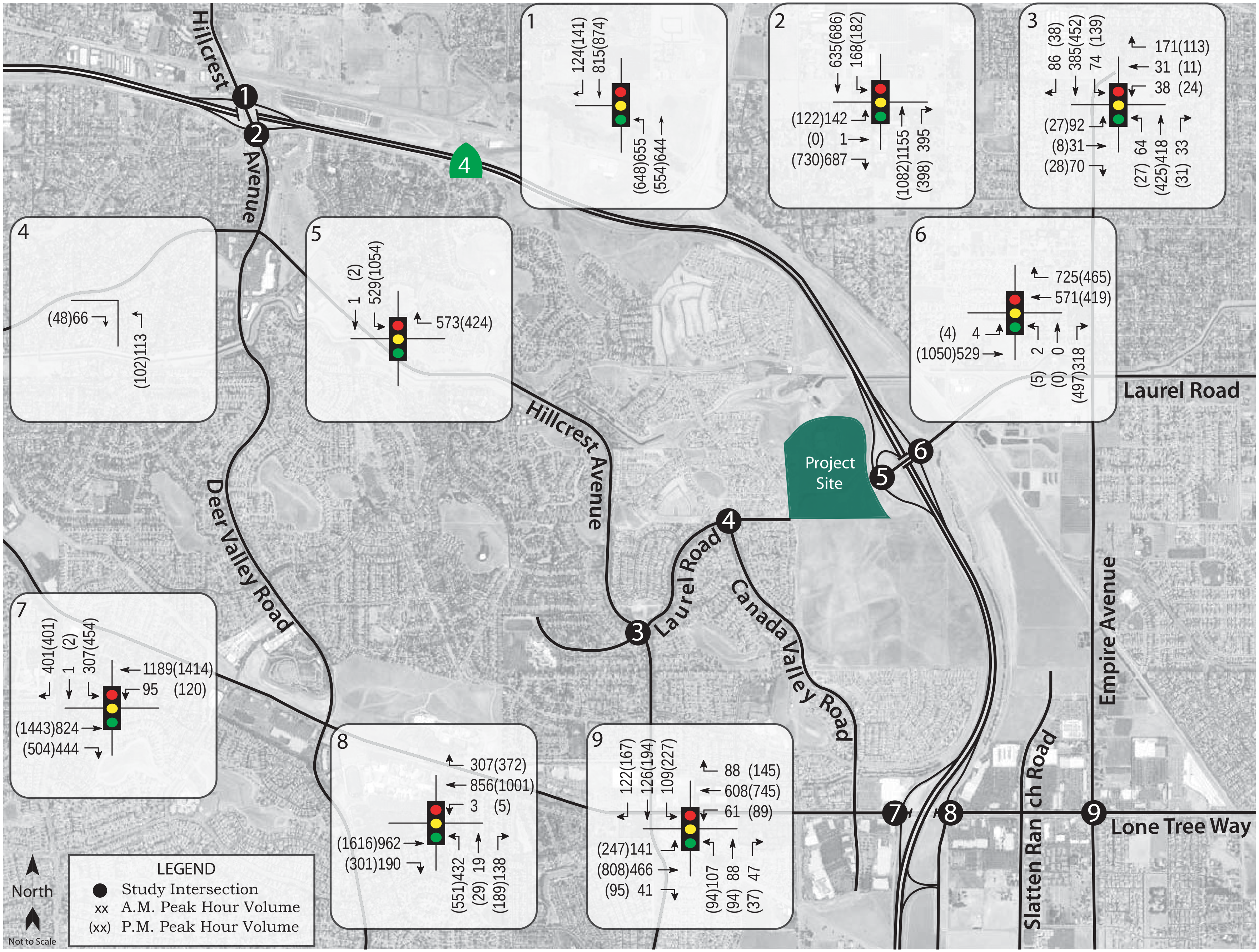

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Transportation Impact Analysis for Laurel Ranch

Figure 3 – Existing plus Nearby Future Project Traffic Volumes

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Table 4 – Existing plus Nearby Future Project Peak Hour Intersection Levels of Service				
Study Intersection Approach	AM Peak		PM Peak	
	Delay	LOS	Delay	LOS
1. SR 4 WB Ramps/Hillcrest Ave	7.7	A	8.0	B
2. SR 4 EB Ramps/Hillcrest Ave	26.6	C	25.5	C
3. Hillcrest Rd/Laurel Rd	10.4	B	8.5	A
4. Laurel Rd/Canada Valley Rd*	-	-	-	-
5. SR 4 EB Ramps/Laurel Rd	1.4	A	1.0	A
6. SR 4 WB Ramps/Laurel Rd	9.5	A	15.4	B
7. SR 4 EB Ramps/Lone Tree Way	15.1	B	22.6	B
8. SR 4 WB Ramps/Lone Tree Way	8.3	A	11.1	B
9. Lone Tree Way/Empire Ave	16.0	B	19.6	B

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; * = uncontrolled intersection under construction

Cumulative No Project Conditions

Several approaches were used in determining the cumulative base volumes for the year 2040. For the Cumulative Conditions, no development is assumed on the project parcel.

Where possible, previously projected future volumes were taken from studies for other nearby development and incrementally increased based on the growth assumptions used and projected growth from the CCTA model for the year 2040.

For the intersections located on Laurel Road, future volumes were projected from the Park Ridge study's 2025 Cumulative plus Project scenario. For the intersection of Hillcrest Avenue/Laurel Road, the growth per year was determined from the study's existing counts and future projections. This growth per year (growth factor) was then applied to the Laurel Ranch existing counts to project the year 2040 volumes. Where existing counts from the Park Ridge project were unavailable, the projected growth was determined using the CCTA model volumes.

For the intersection of Hillcrest Avenue/SR 4 EB Ramps, 2035 volumes from the *Hillcrest Station Area Specific Plan* (2008), were projected based on the Plan's growth per year determined from the existing and future traffic volumes. This growth per year was then applied to the Laurel Ranch project's existing counts to achieve the year 2040 volumes. Under the Cumulative Scenario, study intersection 1, Hillcrest Avenue/WB SR 4 Ramps, was not analyzed. According to the 4eastcounty.org website, the ramps are to be relocated to Slatten Ranch Road, just west of the future Hillcrest Avenue BART station. Because few project and nearby future project trips were predicted to use the intersection, further analysis of the relocated interchange was not conducted.

Future 2040 peak hour volume projections for the intersections on Lone Tree Way are directly from the Brentwood General Plan Update (2014); this scenario represents Cumulative 2040 traffic conditions that would be expected upon Brentwood's build out to City limits as identified in their Updated General Plan.

Under the Cumulative Conditions, the following roadway modification projects were assumed:

- The connection of Laurel Road from the existing terminus east at Canada Valley Road to the SR 4 eastbound ramps would be completed. The extension would include the following elements:
  - A southbound right-turn pocket would be added to the SR 4 Eastbound Ramps at Laurel Road.

- The intersection at Country Hills Drive/Laurel Road would be completed. The intersection geometry used was from the site plan and protected left-turn phasing was assumed.
- The intersection of Canada Valley Drive/Laurel Road would be signalized. The intersection geometry from the Park Ridge study was used and protected left-turn phasing was assumed.

- Country Hills Drive would be extended north to Laurel Road.
- The Hillcrest Avenue overpass would be widened. The project would add a second eastbound left-turn lane on the off-ramp and widen to the neck. In addition, a second southbound left-turn lane would be constructed.
- Hillcrest Avenue/SR 4 Westbound Ramps would be relocated to Slatten Ranch Road.
- The eastbound lanes of Lone Tree Way/SR 4 Eastbound Ramps would be modified to provide two through lanes and two right-turn lanes.
- Slatten Ranch Road would be constructed. From the north, it would connect to Sunset Drive/Hillcrest Avenue and intersect Laurel Road, and to the south, it would connect to an existing portion already built that is north of Lone Tree Way. The intersection geometry was the same used in the Park Ridge study analysis.

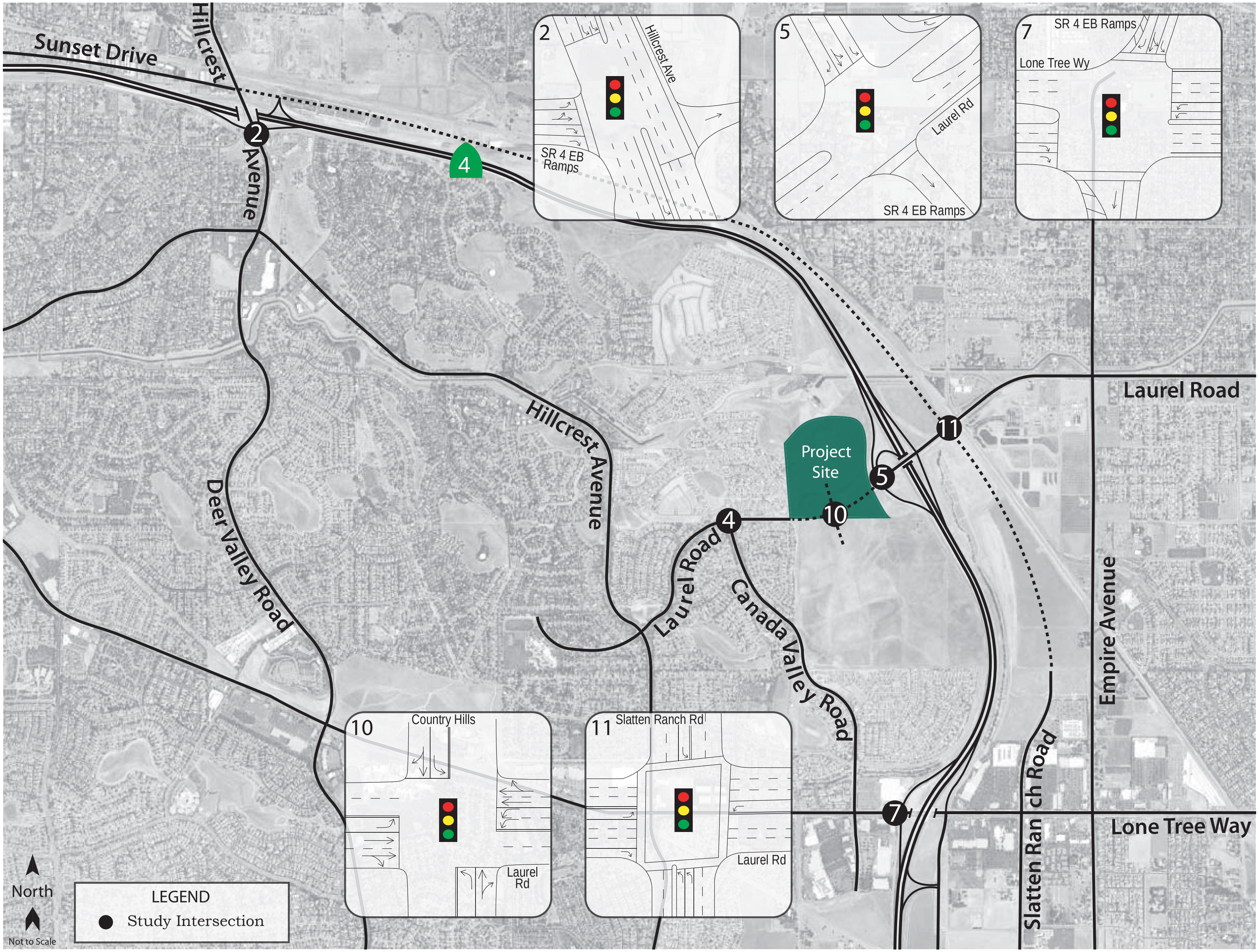
In addition, all seven phases of the Park Ridge project, for a total of 525 single family homes, were assumed completed as well as the Antioch BART Station.

Under the anticipated Future volumes, assuming completion of the improvements noted above and with the addition of the above projects, the study intersections are expected to operate acceptably with the exception of Hillcrest Road/Laurel Road in the a.m. and p.m. peak hours and Laurel Road/Slatten Ranch Road in the p.m. peak hour. While the intersections of SR 4 Eastbound Ramps/Hillcrest Avenue and SR 4 Eastbound Ramps/Lone Tree Way are expected to operate above the desired Caltrans threshold, operation would be acceptable based on the East County Action Plan. Future geometries and volumes are shown in Figures 4 and 5, respectively, and operating conditions are summarized in Table 5.

Table 5 – Cumulative No Project Conditions Peak Hour Intersection Levels of Service

Study Intersection *Approach*	**AM Peak**		**PM Peak**	
	Delay	**LOS**	**Delay**	**LOS**
1. SR 4 WB Ramps/Hillcrest Ave	-	-	-	-
2. SR 4 EB Ramps/Hillcrest Ave	13.9	B	**51.0**	**D**
3. Hillcrest Rd/Laurel Rd	**68.8**	**E**	**107.3**	**F**
4. Laurel Rd/Canada Valley Rd	19.6	B	43.7	D
5. SR 4 EB Ramps/Laurel Rd	17.4	B	25.4	C
6. SR 4 WB Ramps/Laurel Rd	15.8	B	21.4	C
7. SR 4 EB Ramps/Lone Tree Way	30.2	C	**49.7**	**D**
8. SR 4 WB Ramps/Lone Tree Way	13.4	B	21.2	C
9. Lone Tree Way/Empire Ave	18.6	B	27.4	C
10. Laurel Rd/Country Hills Dr	20.3	C	13.9	B
11. Laurel Rd/Slatten Ranch Rd	30.6	C	**55.9**	**E**

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service
Bold text = deficient operation



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Transportation Impact Analysis for Laurel Ranch

Figure 4 – Future Lane Configurations

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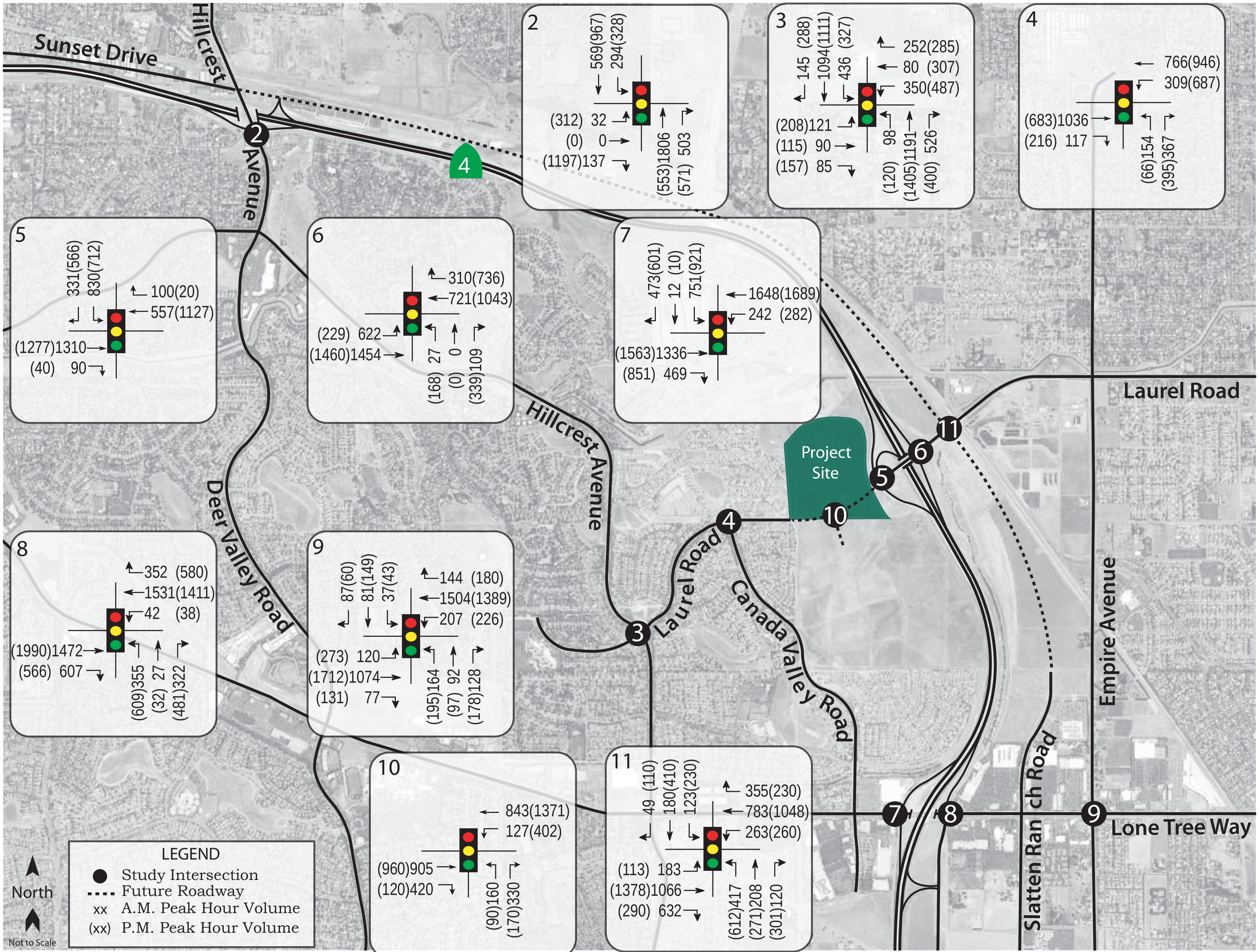

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Transportation Impact Analysis for Laurel Ranch

Figure 5 – Future Traffic Volumes

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Project Description

The project consists of 187 single family homes on 54 acres, located north of the future Laurel Road connection and west of the SR 4 Eastbound Ramps. The site would be accessed by a signalized intersection at Laurel Road/Country Hills Drive and a stop-controlled driveway west of the intersection with right-in and right-out access only. Currently the site is unused. The proposed project site plan is shown in Figure 6.

Trip Generation

The anticipated trip generation for the proposed project was estimated using standard rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation Manual*, 9th Edition, 2012 for "Single Family Detached Housing" (ITE LU 210). Because the site is currently unoccupied, there are no existing trips being generated by the site.

Total Project Trip Generation

The expected trip generation potential for the proposed project is indicated in Table 6. The proposed project is expected to generate an average of 1,780 trips per day, including 140 trips during the a.m. peak hour and 187 during the p.m. peak hour. These new trips represent the increase in traffic associated with the project compared to existing volumes.

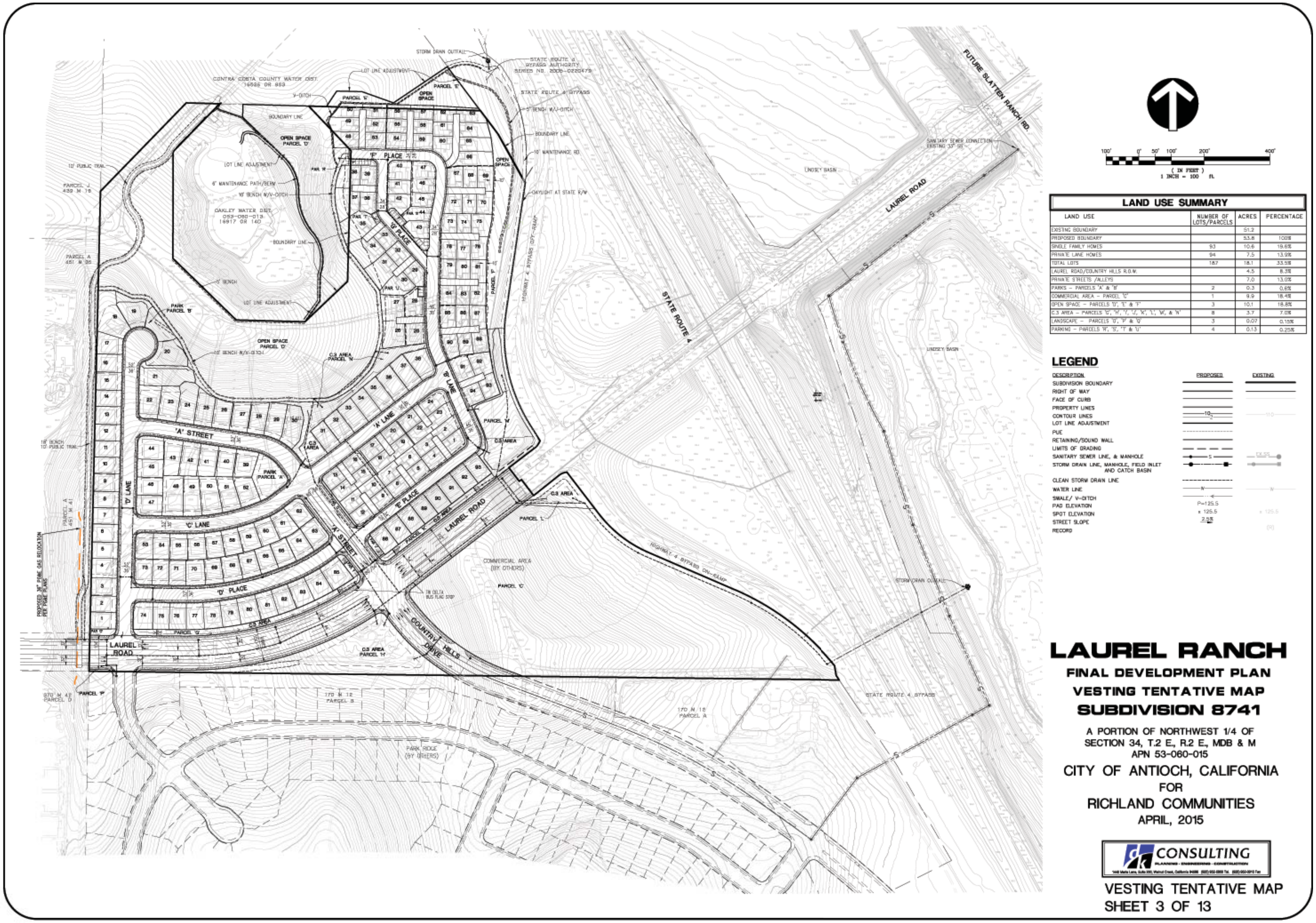
Table 6 – Trip Generation Summary

Land Use	Units	Daily		AM Peak Hour				PM Peak Hour			
		Rate	Trips	Rate	Trips	In	Out	Rate	Trips	In	Out
Single Family Detached Housing	187 du	9.52	1,780	0.75	140	35	105	1.00	187	118	69

Note: du = dwelling unit

Trip Distribution

The pattern used to allocate new project trips to the street network was based on existing traffic patterns as identified by the City as well as recent transportation studies completed for other projects in the study area. These applied distribution assumptions and resulting trips are shown in Figure 7 and detailed in Table 7.



LAND USE	NUMBER OF LOTS/PARCELS	ACRES	PERCENTAGE
EXISTING BOUNDARY		51.2	
PROPOSED BOUNDARY		53.8	100%
SINGLE FAMILY HOMES	93	10.6	19.6%
PRIVATE LANE HOMES	94	7.5	13.9%
TOTAL LOTS	187	18.1	33.5%
LAUREL ROAD/COUNTRY HILLS R.O.W.		4.5	8.3%
PRIVATE STREETS /ALLEYS		7.0	13.0%
PARKS – PARCELS 'A' & 'B'	2	0.3	0.6%
COMMERCIAL AREA – PARCEL 'C'	1	9.9	18.4%
OPEN SPACE – PARCELS 'D', 'E' & 'F'	3	10.1	18.8%
C.3 AREA – PARCELS 'G', 'H', 'I', 'J', 'K', 'L', 'M', & 'N'	8	3.7	7.0%
LANDSCAPE – PARCELS 'O', 'P' & 'Q'	3	0.07	0.15%
PARKING – PARCELS 'R', 'S', 'T' & 'U'	4	0.13	0.25%

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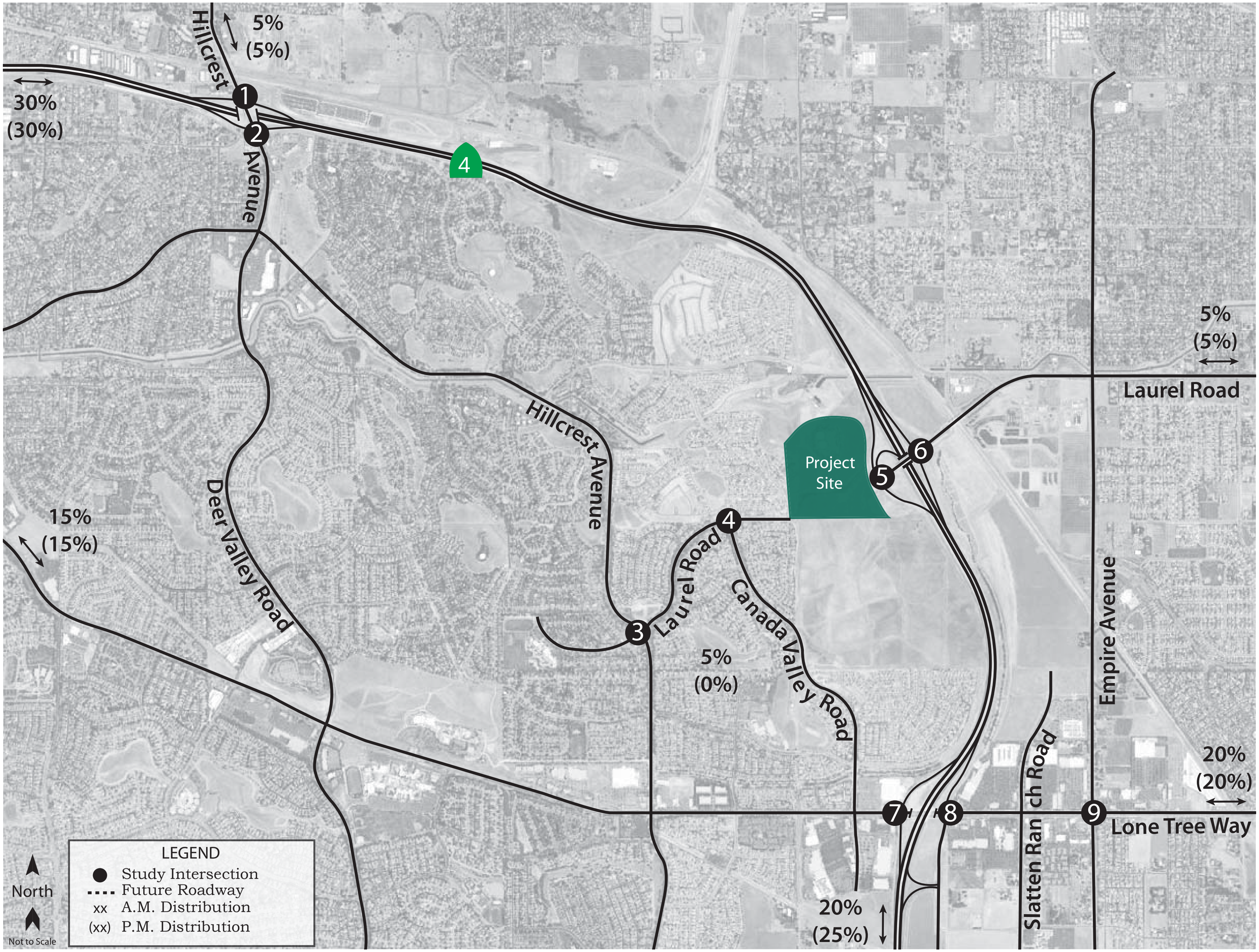
Transportation Impact Analysis for Laurel Ranch
Figure 6 – Site Plan



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Transportation Impact Analysis for Laurel Ranch

Figure 7 – Trip Distribution

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Table 7 – Trip Distribution Assumptions				
Route	**AM Percent**	**PM Percent**	**AM Trips**	**PM Trips**
To/From the North (West) via SR 4	30%	30%	42	56
To/From the South (East) via SR 4	20%	25%	28	47
To/From the East via Lone Tree Way	20%	20%	28	38
To/From the West via Lone Tree Way	15%	15%	21	28
To/From the East via Laurel Rd	5%	5%	7	9
To/From eBART via Hillcrest Ave*	5%	5%	7	9
To/From Carmen Dragon School	5%	0%	7	0
TOTAL	**100%**	**100%**	**140**	**187**

Note: * The route will be via Slatten Ranch Rd under the Cumulative Scenario

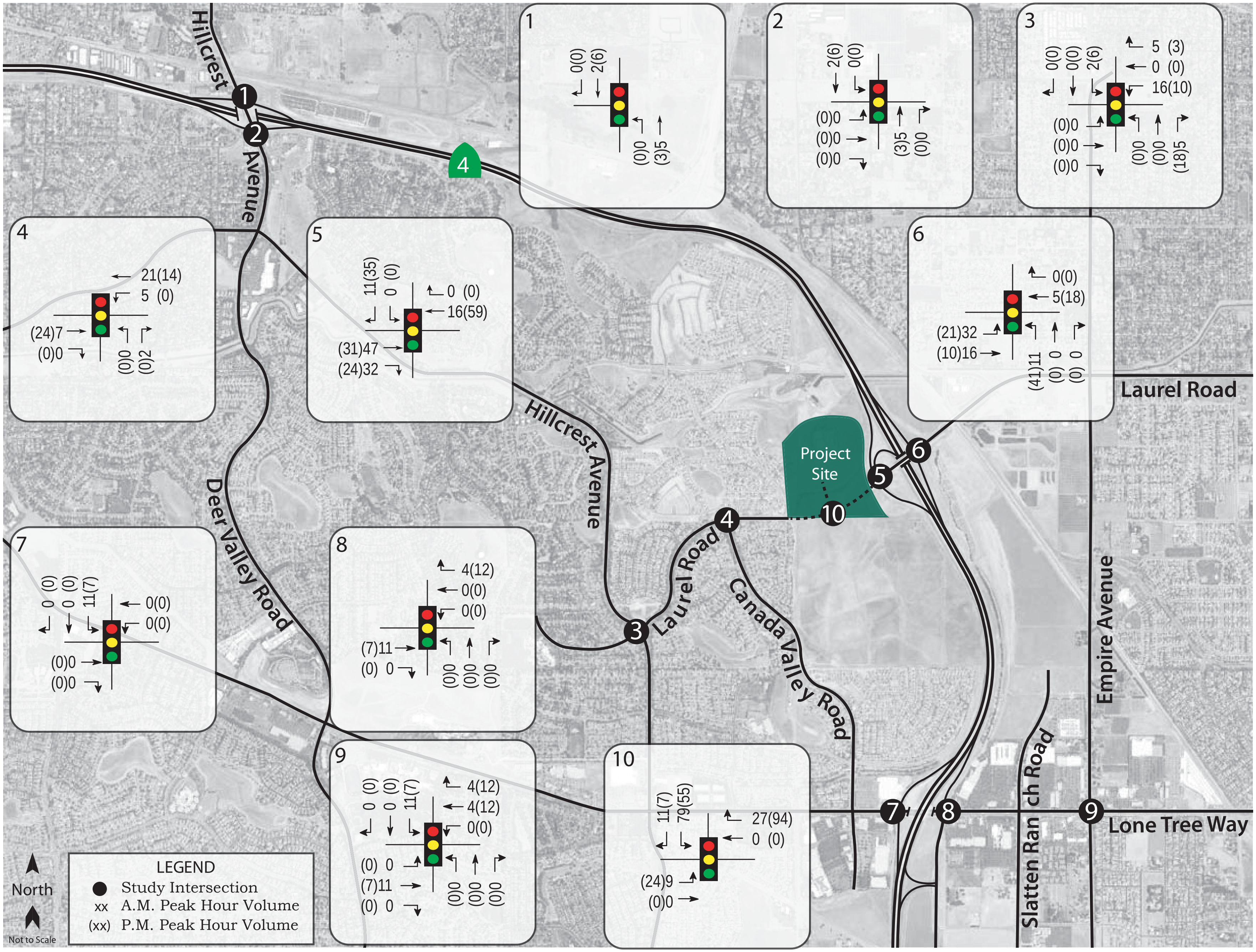
Intersection Operation

Existing plus Project Conditions

Because the proposed Laurel Ranch Project would be accessed exclusively through Laurel Road the improvements assumed under the Cumulative Condition would instead be first implemented with the project completion. The roadway modifications include all the improvements associated with the Laurel Road extension described in the Cumulative scenario. Based on the site plan, it was assumed that the signalized project intersection at Country Hills Drive/Laurel Road would have all four legs constructed; however, since no development was assumed to have occurred directly south, no vehicle trips would be on that leg and the intersection was analyzed as a tee-intersection.

In addition, the Laurel Road connection would provide improved access to SR 4 for the residential communities to the west, while also providing more direct access to and from the City of Oakley and the surrounding area. With the Laurel Road connection, existing traffic patterns would shift. New base volumes along Laurel Road were estimated using the existing counts and the projected growth trends from the CCTA model.

Upon the addition of project-related traffic to the Existing volumes, and with the shifts in traffic anticipated due to the extension of Laurel road, the study intersections are expected to operate at LOS C or better. These results are summarized in Table 8. Added project traffic volumes are shown in Figure 8.



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Transportation Impact Analysis for Laurel Ranch

Figure 8 – Existing Project Traffic Volumes

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Table 8 – Existing and Existing plus Project Peak Hour Intersection Levels of Service								
Study Intersection *Approach*	**Existing Conditions**				**Existing plus Project**			
	AM Peak		**PM Peak**		**AM Peak**		**PM Peak**	
	Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
1. SR 4 WB Ramps/Hillcrest Ave	7.7	A	8.0	B	7.7	A	8.0	B
2. SR 4 EB Ramps/Hillcrest Ave	26.5	C	25.5	C	26.6	C	25.5	C
3. Hillcrest Rd/Laurel Rd	10.4	B	8.5	A	13.7	B	12.9	A
4. Laurel Rd/Canada Valley Rd	-	-	-	-	9.1	A	8.0	A
5. SR 4 EB Ramps/Laurel Rd	1.4	A	1.0	A	7.8	A	14.4	B
6. SR 4 WB Ramps/Laurel Rd	9.5	A	15.4	B	21.0	C	30.9	C
7. SR 4 EB Ramps/Lone Tree Way	14.7	B	16.3	B	14.7	B	16.3	B
8. SR 4 WB Ramps/Lone Tree Way	8.2	A	10.8	B	8.3	A	10.9	B
9. Lone Tree Way/Empire Ave	15.2	B	18.8	B	15.3	B	18.9	B
10. Laurel Rd/Country Hills Dr	-	-	-	-	4.5	A	4.7	A

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service

Finding – The study intersections are expected to continue operating acceptably with the shift in traffic volumes due to the Laurel Road connection and upon the addition of project-generated traffic, and the project would result in less-than-significant intersection impacts.

Existing plus Nearby Project plus Project Conditions

Similarly to the Existing plus Project conditions, the completion of the Laurel Ranch project would include the roadway improvements along Laurel Road assumed in the Cumulative Scenario. With this connection, the trips generated from the nearby project, Park Ridge, would use the SR 4 ramps on Laurel Road instead of the ramps on Lone Tree Way. This assumption matches the route assignments used in the Park Ridge study with Laurel Road connection completed. The same new base volumes from the Existing plus Project scenario were used in the analysis, then the Park Ridge trips were added in addition to the project traffic.

Upon the addition of project-related traffic to the Existing plus Nearby Project condition volumes and assumed geometric changes with new base volumes, the study intersections are expected to operate acceptably at LOS C or better. These results are summarized in Table 9.

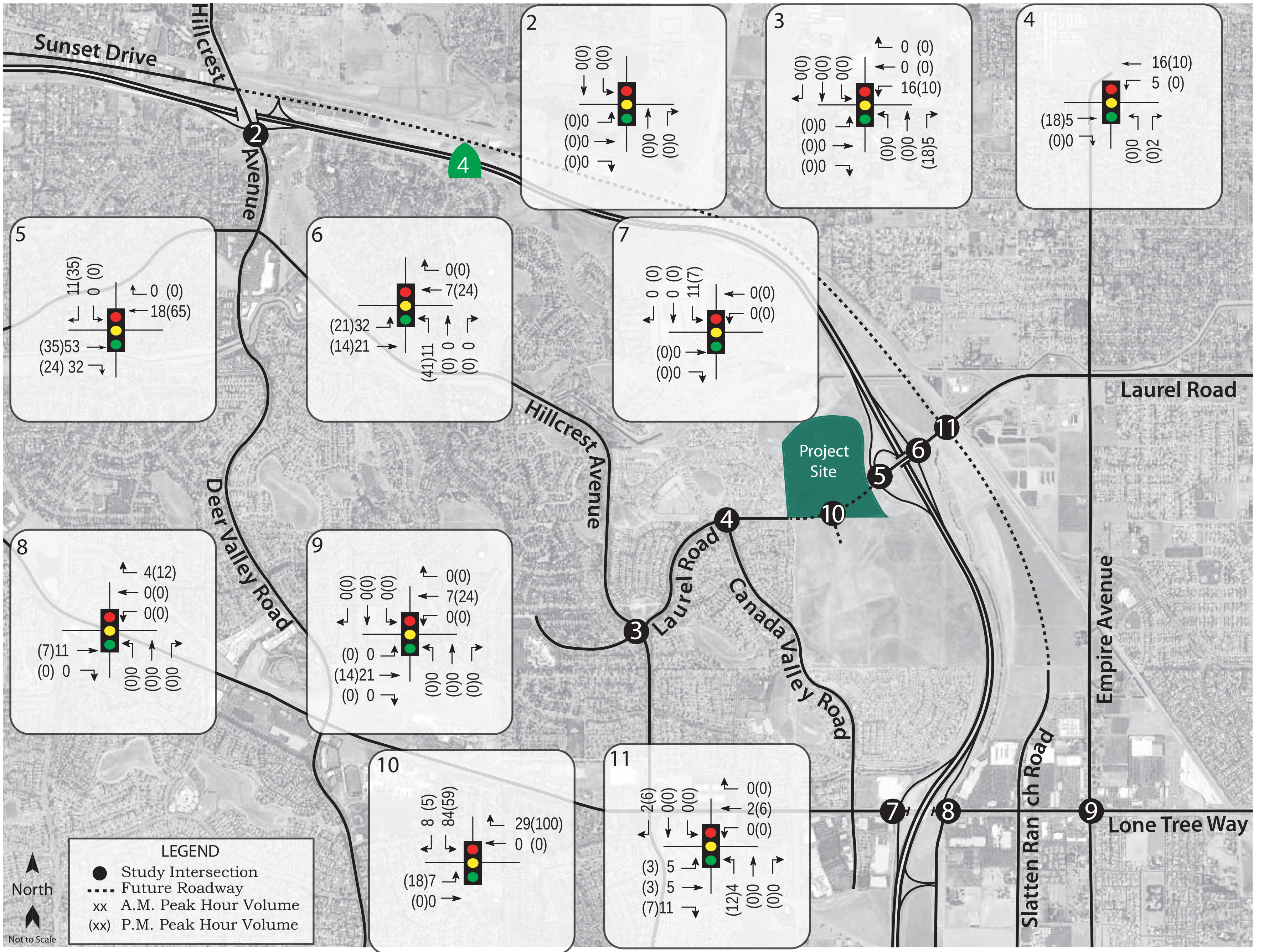
Table 9 – Existing plus Nearby Project and Existing plus Nearby Project plus Project Peak Hour Intersection Levels of Service								
Study Intersection *Approach*	**Existing plus Nearby Project**				**Existing plus Nearby Project plus Project**			
	AM Peak		**PM Peak**		**AM Peak**		**PM Peak**	
	Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
1. SR 4 WB Ramps/Hillcrest Ave	7.7	A	8.0	B	7.7	A	8.0	B
2. SR 4 EB Ramps/Hillcrest Ave	26.6	C	25.5	C	26.6	C	25.9	C
3. Hillcrest Rd/Laurel Rd	10.4	B	8.5	A	13.8	B	12.9	B
4. Laurel Rd/Canada Valley Rd	-	-	-	-	9.6	A	9.0	A
5. SR 4 EB Ramps/Laurel Rd	1.4	A	1.0	A	8.0	A	15.3	B
6. SR 4 WB Ramps/Laurel Rd	9.5	A	15.4	B	22.3	A	32.7	C
7. SR 4 EB Ramps/Lone Tree Way	15.1	B	22.6	B	14.7	B	16.3	B
8. SR 4 WB Ramps/Lone Tree Way	8.3	A	11.1	B	8.3	A	10.9	B
9. Lone Tree Way/Empire Ave	16.0	B	19.6	B	15.7	B	19.0	B
10. Laurel Rd/Country Hills Dr	-	-	-	-	4.5	A	4.7	A

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service

Finding – The study intersections are expected to continue operating acceptably upon the addition of project-generated traffic and completion of the Laurel Road connection project.

Cumulative plus Project Conditions

Upon the addition of project-generated traffic to the anticipated Future volumes, as seen in Figure 9, and with the planned improvements, the study intersections are expected to operate acceptably, with the exception of the same four intersections and peak periods that would operate at a deficient level under the Cumulative No Project Scenario. While the intersections of SR 4 Eastbound Ramps/Hillcrest Avenue and SR 4 Eastbound Ramps/Lone Tree Way would still operate below the desired Caltrans threshold, the intersections would continue to operate acceptably based on the East County Action Plan. The Cumulative plus Project operating conditions are summarized in Table 10.



Transportation Impact Analysis for Laurel Ranch

Figure 9 – Future Project Traffic Volumes

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Table 10 – Cumulative and Cumulative plus Project Peak Hour Levels of Service								
Study Intersection	**Cumulative Conditions**				**Cumulative plus Project**			
Approach	**AM Peak**		**PM Peak**		**AM Peak**		**PM Peak**	
	Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
1. SR 4 WB Ramps/Hillcrest Ave	-	-	-	-	-	-	-	-
2. SR 4 EB Ramps/Hillcrest Ave	13.9	B	**51.0**	**D**	13.9	B	**51.0**	**D**
3. Hillcrest Rd/Laurel Rd	**68.8**	**E**	**107.3**	**F**	**71.6**	**E**	**108.9**	**F**
4. Laurel Rd/Canada Valley Rd	19.6	B	43.7	D	19.9	B	45.4	D
5. SR 4 EB Ramps/Laurel Rd	17.4	B	25.4	C	18.8	B	30.3	C
6. SR 4 WB Ramps/Laurel Rd	15.8	B	21.4	C	17.3	B	23.0	C
7. SR 4 EB Ramps/Lone Tree Way	30.2	C	**49.7**	**D**	30.3	C	**49.7**	**D**
8. SR 4 WB Ramps/Lone Tree Way	13.4	B	21.2	C	13.4	B	21.3	C
9. Lone Tree Way/Empire Ave	18.6	B	27.4	C	18.6	B	27.5	C
10. Laurel Rd/Country Hills Dr	20.3	C	13.9	B	37.6	D	23.2	C
11. Laurel Rd/Slatten Ranch Rd	30.6	C	**55.9**	**E**	30.9	C	**57.0**	**E**

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; **Bold** text = deficient operation

Finding – The study intersections previously operating acceptably would continue to do so with project traffic added. Where operation is LOS D or worse, the increase in delay due to the project is less than five seconds and therefore within the acceptable threshold as set forth by the regulating agencies, and the project would not result in any significant cumulative intersection impacts.

CCTA Regional Roadway Analysis

According to the East County Action Plan, one of the MTSOs for all freeway segments in East County is a delay index. However, following the CCTA Final Technical Procedures (2013), the threshold for analysis of freeway MTSOs would not be satisfied. As stated, "when the proposed project adds more than 50 net new peak hour vehicle trips to a freeway ramp, then the impact of the project on freeway MTSOs should be evaluated." Therefore, because the proposed project would not add more than 50 net new peak hour trips to any one of the ten freeway ramps from the five study intersections under the Cumulative scenario, the freeway MTSOs were not required to be analyzed.

Queuing

Project Access Roadways

Queuing analysis was performed for the project driveways in order to determine adequacy of turn pocket lengths in reference to projected queue lengths. Analysis for the project driveways was performed under volumes for the Cumulative and Cumulative plus Project scenarios. As noted in the site plan, there are two roads that access Laurel Road; one is the signalized study intersection of Country Hills Drive/Laurel Road and the second is Laurel Road/"Lane D", a side street stop-controlled intersection with only right-in and right-out access due to the median on Laurel Road.

Under the Cumulative Scenarios, the projected 95th percentile queues in left-turn pockets at the study intersection and the queue at the unsignalized intersection of Laurel Road/D Lane were determined using the SIMTRAFFIC application of Synchro, and averaging the projected 95th percentile queue for each of five runs. The 95th percentile queue represents the peak of the peak, or queues that only have a five percent chance of being exceeded. The estimated available storage lengths for the intersections are all approximations based on the site plan for the project. Summarized in Table 11 are the predicted queue lengths for approaches to intersections. Copies of the SIMTRAFFIC projections are contained in Appendix C.

Table 11 – 95th Percentile Project Driveway Queues

Intersection Approach	**Estimated Available Storage***	**95th Percent Queues**			
		AM Peak Hour		**PM Peak Hour**	
		C	**C+P**	**C**	**C+P**
Laurel Rd/Country Hills Dr					
SB Left-Turn	100	-	76	-	64
NB Left-Turn	250	147	154	81	96
WB Left-Turn #1	200	61	61	116	106
WB Left-Turn #2	200	94	82	127	165
EB Left-Turn	215	-	25	-	28
Laurel Road/Lane D					
SB Right-Turn	100	-	42	-	20

Notes: 95th Percent Queue based on the calculated potential from five averaged SIMTRAFFIC runs
* = Storage length estimated based on site plan, measured in feet
C = cumulative conditions; C+P = future plus project conditions;

The results of the 95th percentile queuing analysis indicate that the estimated available storage lengths, as proposed, would be adequate to accommodate future volumes in addition to proposed Laurel Ranch and Park Ridge project traffic volumes.

Finding – The project would not result in queues exceeding the estimated available storage.

Alternative Access Queuing Analysis

In addition, a proposed second access alternative for the side-street stop-controlled intersection Laurel Road/ D Lane-Treeline Way (Park Ridge project access road) was analyzed for potential vehicle queue lengths.

As part of the *Davidon Homes (Park Ridge Subdivision) Addendum to the Project Level EIR*, the intersection of D Lane-Treeline Way/Laurel Road had no turning movement restrictions and was analyzed with stop-controlled side streets. Under the cumulative scenario with the completion of both the Laurel Ranch Project and the Park Ridge Project, the intersection as a whole was expected to operate at LOS A but the southbound side street, specifically the left-turn from D Lane, was projected to operate deficiently at LOS F with 67 seconds of delay in the a.m. peak hour and 68 seconds during the p.m. peak hour. Based on the significance criterion for unsignalized intersections, the project would only cause a significant impact if the intersection operated at an unacceptable LOS overall and satisfied the CA MUTCD peak hour signal warrant. As documented in the Park Ridge EIR report, it was determined that the intersection did not meet this signal warrant and as such would not result in a significant impact. If the intersection were to be signalized, it would operate at an acceptable level.

In the Park Ridge project analysis, this intersection was assumed with no median or turning movement restrictions. However, the geometry assumed for Laurel Ranch's access Alternative 2 would allow westbound left turns from Laurel Road into the Park Ridge project in addition to the right turns in, but restrict egress to right turns out. The access to the Laurel Ranch project would continue to be right-in and right-out only. The traffic volumes accessing Treeline Way were the same assumed in the Park Ridge study.

Under the Cumulative scenarios, the projected 95th percent queues in westbound left-turn pocket on Laurel Road to Treeline Way were also determined using the SIMTRAFFIC application of Synchro. Summarized in Table 12 are the predicted queue lengths for access Alternative 2 for the Park Ridge project. Copies of the SIMTRAFFIC projections are contained in Appendix D.

Table 12 – 95th Percentile Left-Turn Queues on Westbound Laurel Rd at D Lane, Alternative Access 2

Intersection *Approach*	**Estimated Available Storage**	**95th Percent Queues**			
		AM Peak Hour		**PM Peak Hour**	
		C	**C+P**	**C**	**C+P**
Laurel Rd/Lane D-Treeline Way					
WB Left-Turn	200*	36	52	75	68

Notes: 95th Percent Queue based on the calculated potential from five averaged SIMTRAFFIC runs; * = Storage length estimated based on potential space according to site plan, measured in feet; C = Cumulative Conditions; C+P = Future plus Project Conditions

According to the queuing calculations, there would be adequate space in the proposed Laurel Road median to incorporate a left-turn pocket. While the median can accommodate a storage length of approximately 200 feet, based on the queuing calculations, the storage length can be shorter if desired.

Finding – Projected queue lengths from Alternative 2 can be accommodated in the available length of the Laurel Road median.

Alternative Modes

Pedestrian Facilities

Given the proximity of other residential neighborhoods, schools, open space, and commercial areas near the site, it is reasonable to assume that some Laurel Ranch residents would want to walk, bicycle, and/or use transit to reach what the surrounding area has to offer.

Project Site – Based on the site plan, sidewalks are planned along both sides of Laurel Road fronting the project site. However, the site plan shows a connection with the existing sidewalk network only on the south side of Laurel Road near the SR 4 Eastbound on-ramps; the north side of Laurel Road does not have existing facilities west of the channelized westbound right-turn. The proposed sidewalks to the south and west of the Country Hills Drive/Laurel Road intersection do not indicate a connection with proposed nearby facilities.

In addition, there is no indication of pedestrian crossings at the signalized study intersection.

As part of the Park Ridge subdivision, much of the internal land would remain as open space and include pedestrian trails. To improve connectivity with the other nearby trail networks, particularly the Delta De Anza trail located just north of the Laurel Ranch project, the internal trails from the Park Ridge Subdivision would cross Laurel Road in the vicinity of the Laurel Ranch Project. This would require some manner of pedestrian facilities, such as a pedestrian signal or rectangular rapid flashing beacons (RRFB) which are described in more detail in the Park Ridge EIR.

Starting from the open space trailhead on the Park Ridge subdivision street of Treeline Court, the trail would continue through the court and Treeline Way to meet at the intersection of Laurel Road/Treeline Way. Just to the west of this intersection, on the north side of Laurel Road, is the existing trail that connects to Delta De Anza Trail. The improvements to Laurel Road would connect the north and south side pedestrian facilities in the vicinity of this area.

Finding – There would be a gap in pedestrian facilities serving the project site if no sidewalk connections to the existing facilities are provided.

Recommendation – The proposed pedestrian facilities should connect either with the existing or proposed sidewalk facilities on the north and south side Laurel Road to the east and west of the project site. In addition to pedestrian curb ramps at the intersection, crosswalks with pedestrian phase should be included in the project.

Bicycle Facilities

Proposed bicycle facilities include bike lanes on Laurel Road fronting the site and connecting to existing facilities to the west. Together with shared use of minor streets, adequate access for bicyclists would be provided.

Finding – Bicycle facilities proposed for the project site are expected to be adequate.

Recommendation – Bike lanes should be provided on Laurel Road as indicated on preliminary site plans.

Transit

According to the site plan, there would be proposed Tri Delta Bus stop locations on the northwest and southeast corners of the Laurel Road/Country Hills Drive intersection. Given these additional stops and the existing stops located west of Canada Valley Road, transit routes are expected to be adequate to accommodate project-generated transit trips.

Finding – Proposed and existing transit facilities serving the project site are expected to be adequate.

Access and Circulation

Site Access

As mentioned in the queuing analysis section, there would be two project access points: the signalized study intersection of Country Hills Drive/Laurel Road and the side-street stop-controlled intersection of Laurel Road/D Lane, which would be limited to right-turn in and out only. Access through the signalized study intersection was assumed to have protected left-turn phasing. Access through the unsignalized intersection would remain right-in and right-out for both access alternatives proposed at the intersection. Further details of the alternative access can be found in the Queuing section.

On-site circulation was reviewed based on the design as presented in the preliminary plans under the assumption that the design of the subdivision adhered to the proper ordinances and regulations set forth by the regulatory agencies. Review of the site plan indicated no circulation issues.

Sight Distance

At unsignalized intersections a substantially clear line of sight should be maintained between the driver of a vehicle waiting at the crossroad and the driver of an approaching vehicle. Adequate time must be provided for the waiting vehicle to turn right, without requiring the through traffic to radically alter their speed. Sight distance should be measured from a 3.5-foot height at the location of the driver on the minor road to a 4.25-foot object height in the center of the approaching lane of the major road. Set-back for the driver on the crossroad shall be a minimum of 15 feet, measured from the edge of the traveled way.

Sight distance along Laurel Road at D Lane was evaluated based on sight distance criteria contained in the *Highway Design Manual* published by Caltrans. The recommended sight distance at intersections of public streets is based on corner sight distances, which uses the approach travel speeds as the basis for determining the recommended sight distance.

Sight distance at the intersection was measured using the site plan. Based on the posted speed limit on Laurel Road between Hillcrest Avenue and Canada Valley Drive of 45 mph, the minimum corner sight distance needed is 495 feet. Because the intersection would be restricted to right-turn only movements, only sight distance to the east was reviewed. Based on the site plan, the lines of sight would adequate. A graphic of the sight distance is provided in Appendix E.

However, in order to maintain these sight lines for vehicles leaving the site, it is recommended that landscaping be trimmed such that tree canopies are at least seven feet above the ground; other landscaping within the sight lines should be limited to low-lying vegetation no greater than three feet in height. In addition, signs and monuments planned along the project's frontage should be placed in a manner that does not obstruct sight distance at the project intersections.

Finding – Sight distance lines at the unsignalized intersection of Laurel Road/D Lane would require landscaping maintenance.

Recommendation – In order to maintain adequate sight lines for vehicles leaving the site it is recommended that landscaping be trimmed such that tree canopies are at least seven feet above the ground; other landscaping within the sight lines should be limited to low-lying vegetation no greater than three feet in height.

Conclusions and Recommendations

Conclusions

- The project is expected to generate an average of 1,780 trips per day, including 140 a.m. peak hour trips and 187 trips during the p.m. peak hour.
- Study intersections analyzed under existing conditions operate acceptably and are expected to continue to do so in the near-term as well as for the cumulative scenarios with the addition of the project traffic and the associated roadway improvements.
- Under the projected future volumes, the study intersections are expected to operate acceptably with the exception of Hillcrest Road/Laurel Road in the a.m. and p.m. peak hours and Laurel Road/Slatten Ranch Road during the p.m. peak hour. The intersections of SR 4 Eastbound Ramps/Hillcrest Avenue and SR 4 Eastbound Ramps/Lone Tree Way are projected to operate below the desired Caltrans threshold, but acceptably based on the East County Action Plan.
- Queuing analysis for the proposed project driveway indicates the projected queue lengths would not exceed the estimated available storage.
- Under access Alternative 2, which would allow westbound left turns into the Park Ridge project, there would be sufficient storage space to accommodate the projected queue lengths.
- Proposed pedestrian facilities as shown on the site plan include sidewalks but do not include a connection to existing facilities. The site plan does not indicate if the signalized intersection would include pedestrian crossings.
- Bicycle and transit facilities, including the addition of bike lanes on Laurel Road based on the site plan, were determined to be adequate for the project.
- No circulation issues were identified on-site.
- Maintaining adequate sight distance at the unsignalized intersection of Laurel Road/D Lane would require landscaping maintenance.

Recommendations

- The sidewalks fronting the project site should connect to existing facilities.
- Pedestrian crosswalks, with a pedestrian phase, should be included in the design of the traffic signal at the Country Hills Drive/Laurel Road intersection.
- In order to maintain adequate sight lines for vehicles leaving the site on D Lane, it is recommended that landscaping be trimmed such that tree canopies are at least seven feet above the ground; other landscaping within the sight lines should be limited to low-lying vegetation no greater than three feet in height.
- Bike lanes should be provided on Laurel Road as indicated on preliminary site plans.

Study Participants and References

Study Participants

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Editing/Formatting	Angela McCoy
Report Review	Dalene J. Whitlock, PE, PTOE

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Appendix A

Intersection LOS Methodology Clarifications and Modifications to CCTA Guidelines

Intersection LOS Methodology
Clarifications and Modifications to CCTA Guidelines

The study intersections were analyzed using the Synchro analysis software, employing methodologies published in the *Highway Capacity Manual* (HCM), Transportation Research Board, 2010 and in accordance with *Technical Procedures* established by the Contra Costa Transportation Authority (CCTA), January 16, 2013. During the course of preparing the analysis, it was necessary to make assumptions and modifications when applying these methodologies. This document summarizes these assumptions.

HCM 2010 Methodology Limitation

The HCM 2010 methodology currently has limitations in determining LOS for certain shared lane configurations, including approaches with through-left lanes that are opposed by more than one through lane. The developers of Synchro, the software used for this analysis, have developed methodologies to approximate the LOS for intersections that have been affected by this limitation. This approximation was applied to the each of study intersections.

Right turn on Red

HCM 2010 methodologies require the number of vehicles observed to complete a right-turn on red movement (RTOR); however, such data was not available for the study intersections. Therefore, the RTOR volumes were estimated using the following method. This method is consistent with recommended methodologies presented in the HCM 2010 when field collected data is not available.

- RTOR volumes were entered only if the right turn movement is served by an exclusive lane and there is a complementary left-turn phase on the cross street
- RTOR may not exceed the number of shadowed left turners on a per lane basis
- RTOR may not exceed 50% of the total right turn volume
- RTOR volumes were not entered channelized yield-controlled right turns, as HCM 2010 methodologies address these movements separately
- RTOR volumes were only entered if there are projected to be 10 or more such movements during a peak hour

Lane Utilization Factor

Lane utilization factors calculated by Synchro were used for the analysis.

Traffic Signal Timing

Traffic signal timing was optimized using Synchro. The following assumptions were applied to the signal timing optimization:

- Assume a minimum 100 second cycle length for all actuated signals
- Green times were allocated by Synchro

Peak Hour Factor

Per CCTA guidance, the peak hour factor (PHF) for intersections is to be 0.92 at intersections with a peak hour entering volume of 1,000 vehicles or more. For intersections with less than 1,000 vehicles entering per peak hour, the PHF is to be 0.90. Under each scenario, every intersection has at least 1,000 vehicles entering so a base PHF of 0.92 was used. However, from the counts conducted at each study intersection, some intersections experience peak hour factors approaching 0.95 to 1.00. For the purposes of this analysis, the PHF for those intersections was capped at 0.95. Unless otherwise stated in the below table, the PHF used for the analysis was 0.92.

Peak Hour Factor Adjustments

Intersections	AM Peak	PM Peak
State Route 4 Westbound Ramps/ Hillcrest Avenue	--	--
State Route 4 Eastbound Ramps/ Hillcrest Avenue	--	0.95
Hillcrest Road/ Laurel Road	--	0.95
Laurel Road/ Canada Valley Road	--	--
State Route 4 Eastbound Ramps/ Laurel Road	--	--
State Route 4 Westbound Ramps/ Laurel Road	--	--
State Route 4 Eastbound Ramps/ Lone Tree Way	--	0.95
State Route 4 Westbound Ramps/ Lone Tree Way	--	0.95
Lone Tree Way/ Empire Avenue	--	0.95
Laurel Road / County Hills Drive	--	--
Laurel Road / Slatten Ranch Road	--	--

Note: Unless stated otherwise in the table, a PHF of 0.92 was used for all intersections

Appendix B

Intersection Level of Service Calculations

HCM 2010 Signalized Intersection Summary
1: Hillcrest Ave & SR4 WB Ramps

10/24/2015

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	655	641	814	124
Number			5	2	6	16
Initial Q (Qb), veh			0	0	0	0
Ped-Bike Adj(A_pbT)			1.00			1.00
Parking Bus, Adj			1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln			1845	1845	1845	1900
Adj Flow Rate, veh/h			712	697	885	0
Adj No. of Lanes			2	1	2	0
Peak Hour Factor			0.92	0.92	0.92	0.92
Percent Heavy Veh, %			3	3	3	3
Cap, veh/h			989	1686	1884	0
Arrive On Green			0.29	0.91	0.54	0.00
Sat Flow, veh/h			3408	1845	3689	0
Grp Volume(v), veh/h			712	697	885	0
Grp Sat Flow(s),veh/h/ln			1704	1845	1752	0
Q Serve(g_s), s			8.7	2.4	7.3	0.0
Cycle Q Clear(g_c), s			8.7	2.4	7.3	0.0
Prop In Lane			1.00			0.00
Lane Grp Cap(c), veh/h			989	1686	1884	0
V/C Ratio(X)			0.72	0.41	0.47	0.00
Avail Cap(c_a), veh/h			2862	3813	4000	0
HCM Platoon Ratio			1.00	1.00	1.00	1.00
Upstream Filter(I)			1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh			14.8	0.3	6.6	0.0
Incr Delay (d2), s/veh			1.0	0.2	0.2	0.0
Initial Q Delay(d3),s/veh			0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln			4.2	1.0	3.5	0.0
LnGrp Delay(d),s/veh			15.8	0.4	6.8	0.0
LnGrp LOS			B	A	A	
Approach Vol, veh/h				1409	885	
Approach Delay, s/veh				8.2	6.8	
Approach LOS				A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		
Phs Duration (G+Y+Rc), s		46.4			17.5	29.0		
Change Period (Y+Rc), s		4.0			4.0	4.0		
Max Green Setting (Gmax), s		96.0			39.0	53.0		
Max Q Clear Time (g_c+I1), s		4.4			10.7	9.3		
Green Ext Time (p_c), s		17.7			2.8	15.7		

Intersection Summary			
HCM 2010 Ctrl Delay			7.7
HCM 2010 LOS			A

HCM 2010 Signalized Intersection Summary
2: Hillcrest Ave & SR 4 EB Ramps

10/24/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	142	1	687	0	0	0	0	1152	395	168	634	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1845				0	1845	1900	1845	1845	0
Adj Flow Rate, veh/h	154	1	747				0	1252	429	183	689	0
Adj No. of Lanes	0	1	2				0	3	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	511	3	808				0	1660	568	221	2166	0
Arrive On Green	0.29	0.29	0.29				0.00	0.45	0.45	0.13	0.62	0.00
Sat Flow, veh/h	1746	11	2760				0	3876	1268	1757	3597	0
Grp Volume(v), veh/h	155	0	747				0	1133	548	183	689	0
Grp Sat Flow(s),veh/h/ln	1757	0	1380				0	1679	1621	1757	1752	0
Q Serve(g_s), s	6.1	0.0	23.5				0.0	25.2	25.3	9.1	8.4	0.0
Cycle Q Clear(g_c), s	6.1	0.0	23.5				0.0	25.2	25.3	9.1	8.4	0.0
Prop In Lane	0.99		1.00				0.00		0.78	1.00		0.00
Lane Grp Cap(c), veh/h	514	0	808				0	1503	725	221	2166	0
V/C Ratio(X)	0.30	0.00	0.92				0.00	0.75	0.76	0.83	0.32	0.00
Avail Cap(c_a), veh/h	531	0	833				0	1614	779	354	2547	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.5	0.0	30.7				0.0	20.6	20.6	38.2	8.1	0.0
Incr Delay (d2), s/veh	0.3	0.0	15.7				0.0	1.9	4.0	8.7	0.1	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
%ile BackOfQ(50%),veh/ln	3.0	0.0	10.7				0.0	12.0	12.1	5.0	4.0	0.0
LnGrp Delay(d),s/veh	24.9	0.0	46.4				0.0	22.5	24.6	46.8	8.2	0.0
LnGrp LOS	C		D					C	C	D	A	
Approach Vol, veh/h		902						1681			872	
Approach Delay, s/veh		42.7						23.2			16.3	
Approach LOS		D						C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	15.2	44.0		30.2		59.3		
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		
Max Green Setting (Gmax), s	18.0	43.0		27.0		65.0		
Max Q Clear Time (g_c+I1), s	11.1	27.3		25.5		10.4		
Green Ext Time (p_c), s	0.3	12.8		0.7		30.9		

Intersection Summary			
HCM 2010 Ctrl Delay			26.5
HCM 2010 LOS			C

HCM 2010 Signalized Intersection Summary
3: Hillcrest Ave & Laurel Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	92	31	70	38	31	171	64	415	33	74	384	86
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1845	1845	1900	1845	1845	1845	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	100	34	76	41	34	106	70	451	0	80	417	93
Adj No. of Lanes	1	1	0	1	1	1	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	437	99	220	389	358	304	101	1336	0	111	1104	244
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.06	0.38	0.00	0.06	0.39	0.39
Sat Flow, veh/h	1232	508	1136	1266	1845	1568	1757	3597	0	1757	2854	631
Grp Volume(v), veh/h	100	0	110	41	34	106	70	451	0	80	255	255
Grp Sat Flow(s),veh/h/ln	1232	0	1644	1266	1845	1568	1757	1752	0	1757	1752	1733
Q Serve(g_s), s	2.4	0.0	1.9	1.0	0.5	1.9	1.3	3.0	0.0	1.5	3.5	3.5
Cycle Q Clear(g_c), s	2.9	0.0	1.9	2.9	0.5	1.9	1.3	3.0	0.0	1.5	3.5	3.5
Prop In Lane	1.00		0.69	1.00		1.00	1.00		0.00	1.00		0.36
Lane Grp Cap(c), veh/h	437	0	319	389	358	304	101	1336	0	111	678	670
V/C Ratio(X)	0.23	0.00	0.35	0.11	0.10	0.35	0.69	0.34	0.00	0.72	0.38	0.38
Avail Cap(c_a), veh/h	1350	0	1538	1328	1725	1466	901	4124	0	954	2115	2092
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.2	0.0	11.5	12.8	11.0	11.6	15.3	7.3	0.0	15.2	7.3	7.3
Incr Delay (d2), s/veh	0.3	0.0	0.6	0.1	0.1	0.7	8.3	0.1	0.0	8.6	0.3	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.9	0.3	0.3	0.9	0.9	1.5	0.0	1.0	1.7	1.7
LnGrp Delay(d),s/veh	12.4	0.0	12.2	12.9	11.1	12.2	23.6	7.4	0.0	23.9	7.6	7.7
LnGrp LOS	B		B	B	B	B	C	A		C	A	A
Approach Vol, veh/h		210			181			521			590	
Approach Delay, s/veh		12.3			12.2			9.6			9.9	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.1	16.6		10.4	5.9	16.8		10.4
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	18.0	39.0		31.0	17.0	40.0		31.0
Max Q Clear Time (g_c+I1), s	3.5	5.0		4.9	3.3	5.5		4.9
Green Ext Time (p_c), s	0.1	7.3		1.7	0.1	7.3		1.7

Intersection Summary		
HCM 2010 Ctrl Delay		10.4
HCM 2010 LOS		B

HCM 2010 Signalized Intersection Summary
5: SR 4 EB On-Ramps/SR 4 EB Off-Ramps & Laurel Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	0	573	0	0	0	529	1	0
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1900	0	1845	1900				1845	1845	1900
Adj Flow Rate, veh/h	0	0	0	0	0	0				576	0	0
Adj No. of Lanes	0	2	0	0	2	0				2	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	0	3	3				3	3	3
Cap, veh/h	0	47	0	0	47	0				1649	866	0
Arrive On Green	0.00	0.00	0.00	0.00	0.00	0.00				0.47	0.00	0.00
Sat Flow, veh/h	0	-71942	0	0	-71942	0				3514	1845	0
Grp Volume(v), veh/h	0	0	0	0	0	0				576	0	0
Grp Sat Flow(s),veh/h/ln	0	1752	0	0	1752	0				1757	1845	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0				0.8	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0				0.8	0.0	0.0
Prop In Lane	0.00		0.00	0.00		0.00				1.00		0.00
Lane Grp Cap(c), veh/h	0	47	0	0	47	0				1649	866	0
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00				0.35	0.00	0.00
Avail Cap(c_a), veh/h	0	16741	0	0	16741	0				26107	13706	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	0.00	0.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				1.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.1	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
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0				0.3	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				1.4	0.0	0.0
LnGrp LOS										A		
Approach Vol, veh/h		0			0						576	
Approach Delay, s/veh		0.0			0.0						1.4	
Approach LOS											A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				0.0		7.5		0.0
Change Period (Y+Rc), s				4.0		4.0		4.0
Max Green Setting (Gmax), s				36.0		56.0		36.0
Max Q Clear Time (g_c+I1), s				0.0		2.8		0.0
Green Ext Time (p_c), s				0.0		2.3		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		1.4
HCM 2010 LOS		A

Notes

User approved volume balancing among the lanes for turning movement.

HCM 2010 Signalized Intersection Summary
6: SR 4 WB Off-Ramps/SR 4 WB On-Ramps & Laurel Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	4	529	0	0	571	725	2	0	318	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	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			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1845	1845	0	0	1845	1845	1900	1845	1845			
Adj Flow Rate, veh/h	4	575	0	0	621	0	2	0	346			
Adj No. of Lanes	1	2	0	0	2	1	0	1	1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	8	1855	0	0	1502	672	488	0	435			
Arrive On Green	0.00	0.53	0.00	0.00	0.43	0.00	0.28	0.00	0.28			
Sat Flow, veh/h	1757	3597	0	0	3597	1568	1757	0	1568			
Grp Volume(v), veh/h	4	575	0	0	621	0	2	0	346			
Grp Sat Flow(s),veh/h/ln	1757	1752	0	0	1752	1568	1757	0	1568			
Q Serve(g_s), s	0.1	3.8	0.0	0.0	5.1	0.0	0.0	0.0	8.5			
Cycle Q Clear(g_c), s	0.1	3.8	0.0	0.0	5.1	0.0	0.0	0.0	8.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	8	1855	0	0	1502	672	488	0	435			
V/C Ratio(X)	0.52	0.31	0.00	0.00	0.41	0.00	0.00	0.00	0.80			
Avail Cap(c_a), veh/h	170	4652	0	0	3976	1779	1569	0	1400			
HCM Platoon Ratio	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	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	20.6	5.5	0.0	0.0	8.2	0.0	10.8	0.0	13.9			
Incr Delay (d2), s/veh	46.2	0.1	0.0	0.0	0.2	0.0	0.0	0.0	3.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.1	1.9	0.0	0.0	2.5	0.0	0.0	0.0	4.1			
LnGrp Delay(d),s/veh	66.8	5.6	0.0	0.0	8.4	0.0	10.8	0.0	17.2			
LnGrp LOS	E	A			A		B		B			
Approach Vol, veh/h		579			621			348				
Approach Delay, s/veh		6.0			8.4			17.2				
Approach LOS		A			A			B				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		15.5		25.9			4.2	21.8
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		37.0		55.0			4.0	47.0
Max Q Clear Time (g_c+I1), s		10.5		5.8			2.1	7.1
Green Ext Time (p_c), s		1.2		11.0			0.0	10.7

Intersection Summary	
HCM 2010 Ctrl Delay	9.5
HCM 2010 LOS	A

HCM 2010 Signalized Intersection Summary
7: SR 4 EB On-ramps/SR 4 EB Off-Ramps & Lone Tree Way

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	783	434	95	1180	0	0	0	0	307	1	393
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1845	1845	1845	0				1845	1845	1845
Adj Flow Rate, veh/h	0	851	472	103	1283	0				335	0	427
Adj No. of Lanes	0	3	1	2	3	0				2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	2277	709	174	2825	0				1138	0	508
Arrive On Green	0.00	0.45	0.45	0.05	0.56	0.00				0.32	0.00	0.32
Sat Flow, veh/h	0	5202	1568	3408	5202	0				3514	0	1568
Grp Volume(v), veh/h	0	851	472	103	1283	0				335	0	427
Grp Sat Flow(s),veh/h/ln	0	1679	1568	1704	1679	0				1757	0	1568
Q Serve(g_s), s	0.0	7.7	16.4	2.1	10.4	0.0				4.9	0.0	17.6
Cycle Q Clear(g_c), s	0.0	7.7	16.4	2.1	10.4	0.0				4.9	0.0	17.6
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2277	709	174	2825	0				1138	0	508
V/C Ratio(X)	0.00	0.37	0.67	0.59	0.45	0.00				0.29	0.00	0.84
Avail Cap(c_a), veh/h	0	2466	768	344	3263	0				2378	0	1061
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	12.5	14.9	32.2	9.0	0.0				17.6	0.0	21.8
Incr Delay (d2), s/veh	0.0	0.1	2.0	3.2	0.1	0.0				0.1	0.0	3.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.6	7.5	1.0	4.8	0.0				2.4	0.0	8.1
LnGrp Delay(d),s/veh	0.0	12.6	16.9	35.4	9.1	0.0				17.7	0.0	25.7
LnGrp LOS		B	B	D	A					B		C
Approach Vol, veh/h		1323			1386						762	
Approach Delay, s/veh		14.2			11.0						22.2	
Approach LOS		B			B						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			7.6	35.4		26.5		43.0
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			7.0	34.0		47.0		45.0
Max Q Clear Time (g_c+I1), s			4.1	18.4		19.6		12.4
Green Ext Time (p_c), s			0.1	13.0		2.9		23.4

Intersection Summary	
HCM 2010 Ctrl Delay	14.7
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (veh/h)	0	945	166	8	3	850	307	429	19	138	0	0
Number	7	4	14		3	8	18	5	2	12		
Initial Q (Qb), veh	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		
Parking Bus, Adj	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	0	1845	1845		1845	1845	1845	1845	1845	1845		
Adj Flow Rate, veh/h	0	1027	90		3	924	334	481	0	147		
Adj No. of Lanes	0	3	1		1	3	1	2	0	1		
Peak Hour Factor	0.92	0.92	0.92		0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	0	3	3		3	3	3	3	3	3		
Cap, veh/h	0	2718	846		6	3145	979	746	0	333		
Arrive On Green	0.00	0.54	0.54		0.00	0.62	0.62	0.21	0.00	0.21		
Sat Flow, veh/h	0	5202	1568		1757	5036	1568	3514	0	1568		
Grp Volume(v), veh/h	0	1027	90		3	924	334	481	0	147		
Grp Sat Flow(s),veh/h/ln	0	1679	1568		1757	1679	1568	1757	0	1568		
Q Serve(g_s), s	0.0	5.8	1.4		0.1	4.1	5.0	6.1	0.0	4.0		
Cycle Q Clear(g_c), s	0.0	5.8	1.4		0.1	4.1	5.0	6.1	0.0	4.0		
Prop In Lane	0.00		1.00		1.00		1.00	1.00		1.00		
Lane Grp Cap(c), veh/h	0	2718	846		6	3145	979	746	0	333		
V/C Ratio(X)	0.00	0.38	0.11		0.52	0.29	0.34	0.64	0.00	0.44		
Avail Cap(c_a), veh/h	0	3799	1183		501	5647	1758	2651	0	1183		
HCM Platoon Ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	0.00	1.00	1.00		1.00	1.00	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	0.0	6.5	5.5		24.4	4.2	4.4	17.6	0.0	16.8		
Incr Delay (d2), s/veh	0.0	0.1	0.1		58.4	0.1	0.2	0.9	0.0	0.9		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	0.0	2.7	0.6		0.1	1.9	2.2	3.0	0.0	1.8		
LnGrp Delay(d),s/veh	0.0	6.6	5.6		82.8	4.3	4.6	18.6	0.0	17.7		
LnGrp LOS		A	A		F	A	A	B		B		
Approach Vol, veh/h		1117				1261			628			
Approach Delay, s/veh		6.5				4.6			18.4			
Approach LOS		A				A			B			

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		14.4	4.2	30.5				34.6
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		37.0	14.0	37.0				55.0
Max Q Clear Time (g_c+I1), s		8.1	2.1	7.8				7.0
Green Ext Time (p_c), s		2.3	0.0	18.1				23.6

Intersection Summary	
HCM 2010 Ctrl Delay	8.2
HCM 2010 LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Movement	SBR
Lane Configurations	
Volume (veh/h)	0
Number	
Initial Q (Qb), veh	
Ped-Bike Adj(A_pbT)	
Parking Bus, Adj	
Adj Sat Flow, veh/h/ln	
Adj Flow Rate, veh/h	
Adj No. of Lanes	
Peak Hour Factor	
Percent Heavy Veh, %	
Cap, veh/h	
Arrive On Green	
Sat Flow, veh/h	
Grp Volume(v), veh/h	
Grp Sat Flow(s),veh/h/ln	
Q Serve(g_s), s	
Cycle Q Clear(g_c), s	
Prop In Lane	
Lane Grp Cap(c), veh/h	
V/C Ratio(X)	
Avail Cap(c_a), veh/h	
HCM Platoon Ratio	
Upstream Filter(I)	
Uniform Delay (d), s/veh	
Incr Delay (d2), s/veh	
Initial Q Delay(d3),s/veh	
%ile BackOfQ(50%),veh/ln	
LnGrp Delay(d),s/veh	
LnGrp LOS	
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	

Timer

User approved ignoring U-Turning movement.

HCM 2010 Signalized Intersection Summary
9: Empire Avenue & Lone Tree Way

10/24/2015

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Volume (veh/h)	43	131	459	41	61	606	88	15	107	88	47	25
Number		7	4	14	3	8	18		5	2	12	
Initial Q (Qb), veh		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	
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Adj Sat Flow, veh/h/ln		1845	1845	1845	1845	1845	1845		1845	1845	1845	
Adj Flow Rate, veh/h		142	499	23	66	659	48		116	96	26	
Adj No. of Lanes		1	3	1	1	3	1		2	1	1	
Peak Hour Factor		0.92	0.92	0.92	0.92	0.92	0.92		0.92	0.92	0.92	
Percent Heavy Veh, %		3	3	3	3	3	3		3	3	3	
Cap, veh/h		192	1731	539	89	1437	448		239	294	250	
Arrive On Green		0.11	0.34	0.34	0.05	0.29	0.29		0.07	0.16	0.16	
Sat Flow, veh/h		1757	5036	1568	1757	5036	1568		3408	1845	1568	
Grp Volume(v), veh/h		142	499	23	66	659	48		116	96	26	
Grp Sat Flow(s),veh/h/ln		1757	1679	1568	1757	1679	1568		1704	1845	1568	
Q Serve(g_s), s		3.3	3.1	0.4	1.6	4.6	1.0		1.4	2.0	0.6	
Cycle Q Clear(g_c), s		3.3	3.1	0.4	1.6	4.6	1.0		1.4	2.0	0.6	
Prop In Lane		1.00		1.00	1.00		1.00		1.00		1.00	
Lane Grp Cap(c), veh/h		192	1731	539	89	1437	448		239	294	250	
V/C Ratio(X)		0.74	0.29	0.04	0.74	0.46	0.11		0.49	0.33	0.10	
Avail Cap(c_a), veh/h		1979	6501	2024	371	1891	589		320	693	589	
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Upstream Filter(I)		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Uniform Delay (d), s/veh		18.4	10.2	9.3	19.9	12.5	11.2		19.1	15.9	15.3	
Incr Delay (d2), s/veh		5.5	0.1	0.0	11.2	0.2	0.1		1.5	0.6	0.2	
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln		1.9	1.4	0.2	1.0	2.1	0.4		0.7	1.0	0.3	
LnGrp Delay(d),s/veh		23.9	10.3	9.3	31.1	12.7	11.3		20.6	16.5	15.5	
LnGrp LOS		C	B	A	C	B	B		C	B	B	
Approach Vol, veh/h			664			773				238		
Approach Delay, s/veh			13.2			14.2				18.4		
Approach LOS			B			B				B		

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.0	10.8	6.2	18.6	7.0	10.8	8.7	16.2
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.0	16.0	9.0	55.0	4.0	16.0	48.0	16.0
Max Q Clear Time (g_c+I1), s	3.4	4.0	3.6	5.1	3.4	5.3	5.3	6.6
Green Ext Time (p_c), s	0.0	1.7	0.0	9.6	0.0	1.6	0.4	4.9

Intersection Summary	
HCM 2010 Ctrl Delay	15.2
HCM 2010 LOS	B

Notes

User approved ignoring U-Turning movement.

HCM 2010 Signalized Intersection Summary
9: Empire Avenue & Lone Tree Way

10/24/2015

Movement	SBL	SBT	SBR
Lane Configurations			
Volume (veh/h)	109	126	119
Number	1	6	16
Initial Q (Qb), veh	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900
Adj Flow Rate, veh/h	118	137	129
Adj No. of Lanes	2	2	0
Peak Hour Factor	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3
Cap, veh/h	241	284	247
Arrive On Green	0.07	0.16	0.16
Sat Flow, veh/h	3408	1778	1546
Grp Volume(v), veh/h	118	135	131
Grp Sat Flow(s),veh/h/ln	1704	1752	1572
Q Serve(g_s), s	1.4	3.0	3.3
Cycle Q Clear(g_c), s	1.4	3.0	3.3
Prop In Lane	1.00		0.98
Lane Grp Cap(c), veh/h	241	280	251
V/C Ratio(X)	0.49	0.48	0.52
Avail Cap(c_a), veh/h	320	658	590
HCM Platoon Ratio	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.1	16.3	16.4
Incr Delay (d2), s/veh	1.5	1.3	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	1.5	1.5
LnGrp Delay(d),s/veh	20.6	17.6	18.1
LnGrp LOS	C	B	B
Approach Vol, veh/h		384	
Approach Delay, s/veh		18.7	
Approach LOS		B	

Timer

HCM 2010 Signalized Intersection Summary
1: Hillcrest Ave & SR4 WB Ramps

10/24/2015

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	648	552	870	141
Number			5	2	6	16
Initial Q (Qb), veh			0	0	0	0
Ped-Bike Adj(A_pbT)			1.00			1.00
Parking Bus, Adj			1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln			1845	1845	1845	1900
Adj Flow Rate, veh/h			704	600	946	0
Adj No. of Lanes			2	1	2	0
Peak Hour Factor			0.92	0.92	0.92	0.92
Percent Heavy Veh, %			3	3	3	3
Cap, veh/h			979	1685	1893	0
Arrive On Green			0.29	0.91	0.54	0.00
Sat Flow, veh/h			3408	1845	3689	0
Grp Volume(v), veh/h			704	600	946	0
Grp Sat Flow(s),veh/h/ln			1704	1845	1752	0
Q Serve(g_s), s			8.6	1.9	7.9	0.0
Cycle Q Clear(g_c), s			8.6	1.9	7.9	0.0
Prop In Lane			1.00			0.00
Lane Grp Cap(c), veh/h			979	1685	1893	0
V/C Ratio(X)			0.72	0.36	0.50	0.00
Avail Cap(c_a), veh/h			2722	3822	4161	0
HCM Platoon Ratio			1.00	1.00	1.00	1.00
Upstream Filter(I)			1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh			14.8	0.3	6.7	0.0
Incr Delay (d2), s/veh			1.0	0.1	0.2	0.0
Initial Q Delay(d3),s/veh			0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln			4.1	0.9	3.7	0.0
LnGrp Delay(d),s/veh			15.8	0.4	6.9	0.0
LnGrp LOS			B	A	A	
Approach Vol, veh/h				1304	946	
Approach Delay, s/veh				8.7	6.9	
Approach LOS				A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		
Phs Duration (G+Y+Rc), s		46.3			17.3	29.0		
Change Period (Y+Rc), s		4.0			4.0	4.0		
Max Green Setting (Gmax), s		96.0			37.0	55.0		
Max Q Clear Time (g_c+I1), s		3.9			10.6	9.9		
Green Ext Time (p_c), s		16.8			2.7	15.1		

Intersection Summary			
HCM 2010 Ctrl Delay			8.0
HCM 2010 LOS			A

HCM 2010 Signalized Intersection Summary
2: Hillcrest Ave & SR 4 EB Ramps

10/24/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	122	0	730	0	0	0	0	1080	398	182	682	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1845				0	1845	1900	1845	1845	0
Adj Flow Rate, veh/h	128	0	768				0	1137	419	192	718	0
Adj No. of Lanes	0	1	2				0	3	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	540	0	848				0	1537	566	231	2106	0
Arrive On Green	0.31	0.00	0.31				0.00	0.42	0.42	0.13	0.60	0.00
Sat Flow, veh/h	1757	0	2760				0	3795	1337	1757	3597	0
Grp Volume(v), veh/h	128	0	768				0	1052	504	192	718	0
Grp Sat Flow(s),veh/h/ln	1757	0	1380				0	1679	1609	1757	1752	0
Q Serve(g_s), s	4.7	0.0	23.3				0.0	22.9	22.9	9.3	9.0	0.0
Cycle Q Clear(g_c), s	4.7	0.0	23.3				0.0	22.9	22.9	9.3	9.0	0.0
Prop In Lane	1.00		1.00				0.00		0.83	1.00		0.00
Lane Grp Cap(c), veh/h	540	0	848				0	1422	681	231	2106	0
V/C Ratio(X)	0.24	0.00	0.91				0.00	0.74	0.74	0.83	0.34	0.00
Avail Cap(c_a), veh/h	584	0	918				0	1541	738	383	2533	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.6	0.0	29.0				0.0	21.1	21.1	36.9	8.7	0.0
Incr Delay (d2), s/veh	0.2	0.0	11.9				0.0	1.8	3.7	7.6	0.1	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
%ile BackOfQ(50%),veh/ln	2.3	0.0	10.3				0.0	10.9	10.8	5.0	4.3	0.0
LnGrp Delay(d),s/veh	22.8	0.0	40.8				0.0	22.9	24.8	44.4	8.8	0.0
LnGrp LOS	C		D					C	C	D	A	
Approach Vol, veh/h		896						1556			910	
Approach Delay, s/veh		38.3						23.5			16.3	
Approach LOS		D						C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	15.5	40.9		30.8		56.4		
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		
Max Green Setting (Gmax), s	19.0	40.0		29.0		63.0		
Max Q Clear Time (g_c+I1), s	11.3	24.9		25.3		11.0		
Green Ext Time (p_c), s	0.3	12.0		1.5		28.2		

Intersection Summary			
HCM 2010 Ctrl Delay			25.5
HCM 2010 LOS			C

HCM 2010 Signalized Intersection Summary
3: Hillcrest Ave & Laurel Road

10/24/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	27	8	28	24	11	113	27	423	31	139	448	38
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1845	1845	1900	1845	1845	1845	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	28	8	29	25	12	60	28	445	0	146	472	40
Adj No. of Lanes	1	1	0	1	1	1	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	360	34	125	343	182	154	49	1374	0	197	1559	132
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.03	0.39	0.00	0.11	0.48	0.48
Sat Flow, veh/h	1310	350	1270	1352	1845	1568	1757	3597	0	1757	3272	276
Grp Volume(v), veh/h	28	0	37	25	12	60	28	445	0	146	252	260
Grp Sat Flow(s),veh/h/ln	1310	0	1621	1352	1845	1568	1757	1752	0	1757	1752	1796
Q Serve(g_s), s	0.6	0.0	0.6	0.5	0.2	1.1	0.5	2.7	0.0	2.4	2.7	2.7
Cycle Q Clear(g_c), s	0.8	0.0	0.6	1.2	0.2	1.1	0.5	2.7	0.0	2.4	2.7	2.7
Prop In Lane	1.00		0.78	1.00		1.00	1.00		0.00	1.00		0.15
Lane Grp Cap(c), veh/h	360	0	160	343	182	154	49	1374	0	197	835	855
V/C Ratio(X)	0.08	0.00	0.23	0.07	0.07	0.39	0.57	0.32	0.00	0.74	0.30	0.30
Avail Cap(c_a), veh/h	1272	0	1288	1285	1466	1246	582	4411	0	1513	3134	3212
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.7	0.0	12.6	13.1	12.4	12.8	14.5	6.4	0.0	13.0	4.8	4.8
Incr Delay (d2), s/veh	0.1	0.0	0.7	0.1	0.2	1.6	10.2	0.1	0.0	5.4	0.2	0.2
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(50%),veh/ln	0.2	0.0	0.3	0.2	0.1	0.5	0.4	1.3	0.0	1.5	1.3	1.3
LnGrp Delay(d),s/veh	12.8	0.0	13.3	13.2	12.5	14.4	24.7	6.5	0.0	18.4	5.0	5.0
LnGrp LOS	B		B	B	B	B	C	A		B	A	A
Approach Vol, veh/h		65			97			473			658	
Approach Delay, s/veh		13.1			13.8			7.6			8.0	
Approach LOS		B			B			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.4	15.8		7.0	4.8	18.4		7.0				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	26.0	38.0		24.0	10.0	54.0		24.0				
Max Q Clear Time (g_c+I1), s	4.4	4.7		2.8	2.5	4.7		3.2				
Green Ext Time (p_c), s	0.4	7.2		0.6	0.0	7.5		0.5				
Intersection Summary												
HCM 2010 Ctrl Delay			8.5									
HCM 2010 LOS			A									

HCM 2010 Signalized Intersection Summary
5: SR 4 EB On-Ramps/SR 4 EB Off-Ramps & Laurel Road

10/24/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	0	424	0	0	0	1054	2	2
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1900	0	1845	1900				1845	1845	1900
Adj Flow Rate, veh/h	0	0	0	0	0	0				1149	0	0
Adj No. of Lanes	0	2	0	0	2	0				2	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	0	3	3				3	3	3
Cap, veh/h	0	26	0	0	26	0				2456	1289	0
Arrive On Green	0.00	0.00	0.00	0.00	0.00	0.00				0.70	0.00	0.00
Sat Flow, veh/h	0	-71942	0	0	-71942	0				3514	1845	0
Grp Volume(v), veh/h	0	0	0	0	0	0				1149	0	0
Grp Sat Flow(s),veh/h/ln	0	1752	0	0	1752	0				1757	1845	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0				1.9	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0				1.9	0.0	0.0
Prop In Lane	0.00		0.00	0.00		0.00				1.00		0.00
Lane Grp Cap(c), veh/h	0	26	0	0	26	0				2456	1289	0
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00				0.47	0.00	0.00
Avail Cap(c_a), veh/h	0	5805	0	0	5805	0				18516	9721	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	0.00	0.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.1	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
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0				0.8	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				1.0	0.0	0.0
LnGrp LOS										A		
Approach Vol, veh/h		0			0						1149	
Approach Delay, s/veh		0.0			0.0						1.0	
Approach LOS											A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				0.0		13.3		0.0				
Change Period (Y+Rc), s				4.0		4.0		4.0				
Max Green Setting (Gmax), s				22.0		70.0		22.0				
Max Q Clear Time (g_c+I1), s				0.0		3.9		0.0				
Green Ext Time (p_c), s				0.0		5.5		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			1.0									
HCM 2010 LOS			A									

Notes

User approved volume balancing among the lanes for turning movement.

HCM 2010 Signalized Intersection Summary
6: SR 4 WB Off-Ramps/SR 4 WB On-Ramps & Laurel Road

10/24/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	4	1050	0	0	419	465	5	0	497	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	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			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1845	1845	0	0	1845	1845	1900	1845	1845			
Adj Flow Rate, veh/h	4	1141	0	0	455	0	5	0	540			
Adj No. of Lanes	1	2	0	0	2	1	0	1	1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	8	1703	0	0	1466	656	681	0	608			
Arrive On Green	0.00	0.49	0.00	0.00	0.42	0.00	0.39	0.00	0.39			
Sat Flow, veh/h	1757	3597	0	0	3597	1568	1757	0	1568			
Grp Volume(v), veh/h	4	1141	0	0	455	0	5	0	540			
Grp Sat Flow(s),veh/h/ln	1757	1752	0	0	1752	1568	1757	0	1568			
Q Serve(g_s), s	0.1	15.7	0.0	0.0	5.5	0.0	0.1	0.0	20.3			
Cycle Q Clear(g_c), s	0.1	15.7	0.0	0.0	5.5	0.0	0.1	0.0	20.3			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	8	1703	0	0	1466	656	681	0	608			
V/C Ratio(X)	0.53	0.67	0.00	0.00	0.31	0.00	0.01	0.00	0.89			
Avail Cap(c_a), veh/h	111	2328	0	0	1885	843	1389	0	1240			
HCM Platoon Ratio	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	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	31.4	12.4	0.0	0.0	12.3	0.0	11.9	0.0	18.1			
Incr Delay (d2), s/veh	47.6	0.5	0.0	0.0	0.1	0.0	0.0	0.0	4.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.2	7.6	0.0	0.0	2.7	0.0	0.1	0.0	9.5			
LnGrp Delay(d),s/veh	79.0	12.8	0.0	0.0	12.4	0.0	11.9	0.0	22.8			
LnGrp LOS	E	B			B		B		C			
Approach Vol, veh/h		1145			455			545				
Approach Delay, s/veh		13.1			12.4			22.7				
Approach LOS		B			B			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		28.5		34.7			4.3	30.5
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		50.0		42.0			4.0	34.0
Max Q Clear Time (g_c+I1), s		22.3		17.7			2.1	7.5
Green Ext Time (p_c), s		2.2		13.0			0.0	13.7

Intersection Summary		
HCM 2010 Ctrl Delay		15.4
HCM 2010 LOS		B

HCM 2010 Signalized Intersection Summary
7: SR 4 EB On-ramps/SR 4 EB Off-Ramps & Lone Tree Way

10/24/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1415	497	120	1383	0	0	0	0	454	2	374
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1845	1845	1845	0				1845	1845	1845
Adj Flow Rate, veh/h	0	1489	523	126	1456	0				479	0	394
Adj No. of Lanes	0	3	1	2	3	0				2	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	2468	768	200	3017	0				1055	0	471
Arrive On Green	0.00	0.49	0.49	0.06	0.60	0.00				0.30	0.00	0.30
Sat Flow, veh/h	0	5202	1568	3408	5202	0				3514	0	1568
Grp Volume(v), veh/h	0	1489	523	126	1456	0				479	0	394
Grp Sat Flow(s),veh/h/ln	0	1679	1568	1704	1679	0				1757	0	1568
Q Serve(g_s), s	0.0	17.0	20.3	2.9	13.0	0.0				8.8	0.0	18.7
Cycle Q Clear(g_c), s	0.0	17.0	20.3	2.9	13.0	0.0				8.8	0.0	18.7
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2468	768	200	3017	0				1055	0	471
V/C Ratio(X)	0.00	0.60	0.68	0.63	0.48	0.00				0.45	0.00	0.84
Avail Cap(c_a), veh/h	0	2535	789	343	3295	0				1769	0	789
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	14.7	15.5	36.6	9.0	0.0				22.5	0.0	26.0
Incr Delay (d2), s/veh	0.0	0.4	2.3	3.3	0.1	0.0				0.3	0.0	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.9	9.2	1.4	6.0	0.0				4.3	0.0	8.6
LnGrp Delay(d),s/veh	0.0	15.1	17.8	39.8	9.1	0.0				22.8	0.0	30.0
LnGrp LOS		B	B	D	A					C		C
Approach Vol, veh/h		2012			1582						873	
Approach Delay, s/veh		15.8			11.6						26.1	
Approach LOS		B			B						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			8.7	42.9		27.9		51.6
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			8.0	40.0		40.0		52.0
Max Q Clear Time (g_c+I1), s			4.9	22.3		20.7		15.0
Green Ext Time (p_c), s			0.1	16.6		3.2		32.6

Intersection Summary		
HCM 2010 Ctrl Delay		16.3
HCM 2010 LOS		B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (veh/h)	0	1604	285	20	5	982	372	539	29	189	0	0
Number	7	4	14		3	8	18	5	2	12		
Initial Q (Qb), veh	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		
Parking Bus, Adj	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	0	1845	1845		1845	1845	1845	1845	1845	1845		
Adj Flow Rate, veh/h	0	1688	153		5	1034	392	589	0	197		
Adj No. of Lanes	0	3	1		1	3	1	2	0	1		
Peak Hour Factor	0.95	0.95	0.95		0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	0	3	3		3	3	3	3	3	3		
Cap, veh/h	0	3011	937		9	3328	1036	786	0	351		
Arrive On Green	0.00	0.60	0.60		0.01	0.66	0.66	0.22	0.00	0.22		
Sat Flow, veh/h	0	5202	1568		1757	5036	1568	3514	0	1568		
Grp Volume(v), veh/h	0	1688	153		5	1034	392	589	0	197		
Grp Sat Flow(s),veh/h/ln	0	1679	1568		1757	1679	1568	1757	0	1568		
Q Serve(g_s), s	0.0	14.1	3.0		0.2	6.1	7.8	10.8	0.0	7.7		
Cycle Q Clear(g_c), s	0.0	14.1	3.0		0.2	6.1	7.8	10.8	0.0	7.7		
Prop In Lane	0.00		1.00		1.00		1.00	1.00		1.00		
Lane Grp Cap(c), veh/h	0	3011	937		9	3328	1036	786	0	351		
V/C Ratio(X)	0.00	0.56	0.16		0.54	0.31	0.38	0.75	0.00	0.56		
Avail Cap(c_a), veh/h	0	3011	937		507	4578	1425	1470	0	656		
HCM Platoon Ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	0.00	1.00	1.00		1.00	1.00	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	0.0	8.4	6.2		34.4	5.0	5.3	25.1	0.0	23.9		
Incr Delay (d2), s/veh	0.0	0.2	0.1		40.6	0.1	0.2	1.5	0.0	1.4		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	0.0	6.5	1.3		0.2	2.8	3.4	5.4	0.0	3.5		
LnGrp Delay(d),s/veh	0.0	8.7	6.3		75.0	5.1	5.5	26.5	0.0	25.3		
LnGrp LOS		A	A		E	A	A	C		C		
Approach Vol, veh/h		1841				1431			786			
Approach Delay, s/veh		8.5				5.4			26.2			
Approach LOS		A				A			C			

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		19.5	4.4	45.4				49.8
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		29.0	20.0	39.0				63.0
Max Q Clear Time (g_c+I1), s		12.8	2.2	16.1				9.8
Green Ext Time (p_c), s		2.7	0.0	19.8				36.0

Intersection Summary		
HCM 2010 Ctrl Delay		10.8
HCM 2010 LOS		B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	SBR
Lane Configurations	
Volume (veh/h)	0
Number	
Initial Q (Qb), veh	
Ped-Bike Adj(A_pbT)	
Parking Bus, Adj	
Adj Sat Flow, veh/h/ln	
Adj Flow Rate, veh/h	
Adj No. of Lanes	
Peak Hour Factor	
Percent Heavy Veh, %	
Cap, veh/h	
Arrive On Green	
Sat Flow, veh/h	
Grp Volume(v), veh/h	
Grp Sat Flow(s),veh/h/ln	
Q Serve(g_s), s	
Cycle Q Clear(g_c), s	
Prop In Lane	
Lane Grp Cap(c), veh/h	
V/C Ratio(X)	
Avail Cap(c_a), veh/h	
HCM Platoon Ratio	
Upstream Filter(I)	
Uniform Delay (d), s/veh	
Incr Delay (d2), s/veh	
Initial Q Delay(d3),s/veh	
%ile BackOfQ(50%),veh/ln	
LnGrp Delay(d),s/veh	
LnGrp LOS	
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer	

User approved ignoring U-Turning movement.

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Volume (veh/h)	101	240	803	95	90	737	145	16	94	94	37	59
Number		7	4	14	3	8	18		5	2	12	
Initial Q (Qb), veh		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	
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Adj Sat Flow, veh/h/ln		1845	1845	1845	1845	1845	1845		1845	1845	1845	
Adj Flow Rate, veh/h		253	845	58	95	776	100		99	99	22	
Adj No. of Lanes		1	3	1	1	3	1		2	1	1	
Peak Hour Factor		0.95	0.95	0.95	0.95	0.95	0.95		0.95	0.95	0.95	
Percent Heavy Veh, %		3	3	3	3	3	3		3	3	3	
Cap, veh/h		320	2075	646	123	1509	470		191	239	203	
Arrive On Green		0.18	0.41	0.41	0.07	0.30	0.30		0.06	0.13	0.13	
Sat Flow, veh/h		1757	5036	1568	1757	5036	1568		3408	1845	1568	
Grp Volume(v), veh/h		253	845	58	95	776	100		99	99	22	
Grp Sat Flow(s),veh/h/ln		1757	1679	1568	1757	1679	1568		1704	1845	1568	
Q Serve(g_s), s		7.7	6.6	1.3	3.0	7.1	2.7		1.6	2.8	0.7	
Cycle Q Clear(g_c), s		7.7	6.6	1.3	3.0	7.1	2.7		1.6	2.8	0.7	
Prop In Lane		1.00		1.00	1.00		1.00		1.00		1.00	
Lane Grp Cap(c), veh/h		320	2075	646	123	1509	470		191	239	203	
V/C Ratio(X)		0.79	0.41	0.09	0.77	0.51	0.21		0.52	0.41	0.11	
Avail Cap(c_a), veh/h		1381	4318	1344	377	1509	470		365	560	476	
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Upstream Filter(I)		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Uniform Delay (d), s/veh		21.9	11.6	10.1	25.6	16.2	14.7		25.7	22.4	21.5	
Incr Delay (d2), s/veh		4.4	0.1	0.1	9.8	0.3	0.2		2.2	1.1	0.2	
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln		4.1	3.1	0.6	1.8	3.3	1.2		0.8	1.5	0.3	
LnGrp Delay(d),s/veh		26.2	11.8	10.1	35.4	16.5	14.9		27.8	23.6	21.7	
LnGrp LOS		C	B	B	D	B	B		C	C	C	
Approach Vol, veh/h			1156			971				220		
Approach Delay, s/veh			14.8			18.2				25.3		
Approach LOS			B			B				C		

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.7	11.3	7.9	27.1	7.1	13.9	14.2	20.8
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	7.0	17.0	12.0	48.0	6.0	18.0	44.0	16.0
Max Q Clear Time (g_c+I1), s	5.8	4.8	5.0	8.6	3.6	7.9	9.7	9.1
Green Ext Time (p_c), s	0.1	2.2	0.1	14.4	0.1	2.0	0.7	5.0

Intersection Summary			
HCM 2010 Ctrl Delay			18.8
HCM 2010 LOS			B

Notes

User approved ignoring U-Turning movement.

HCM 2010 Signalized Intersection Summary
9: Empire Avenue & Lone Tree Way
10/24/2015

Movement	SBL	SBT	SBR
Lane Configurations			
Volume (veh/h)	227	194	155
Number	1	6	16
Initial Q (Qb), veh	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900
Adj Flow Rate, veh/h	239	204	163
Adj No. of Lanes	2	2	0
Peak Hour Factor	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3
Cap, veh/h	350	335	254
Arrive On Green	0.10	0.18	0.18
Sat Flow, veh/h	3408	1900	1443
Grp Volume(v), veh/h	239	187	180
Grp Sat Flow(s),veh/h/ln	1704	1752	1590
Q Serve(g_s), s	3.8	5.5	5.9
Cycle Q Clear(g_c), s	3.8	5.5	5.9
Prop In Lane	1.00		0.91
Lane Grp Cap(c), veh/h	350	309	280
V/C Ratio(X)	0.68	0.61	0.64
Avail Cap(c_a), veh/h	426	563	511
HCM Platoon Ratio	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.2	21.3	21.4
Incr Delay (d2), s/veh	3.4	1.9	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	2.8	2.7
LnGrp Delay(d),s/veh	27.6	23.2	23.9
LnGrp LOS	C	C	C
Approach Vol, veh/h		606	
Approach Delay, s/veh		25.1	
Approach LOS		C	

Timer

HCM 2010 Signalized Intersection Summary
1: Hillcrest Ave & SR4 WB Ramps

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	655	644	815	124
Number			5	2	6	16
Initial Q (Qb), veh			0	0	0	0
Ped-Bike Adj(A_pbT)			1.00			1.00
Parking Bus, Adj			1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln			1845	1845	1845	1900
Adj Flow Rate, veh/h			712	700	886	0
Adj No. of Lanes			2	1	2	0
Peak Hour Factor			0.92	0.92	0.92	0.92
Percent Heavy Veh, %			3	3	3	3
Cap, veh/h			988	1686	1886	0
Arrive On Green			0.29	0.91	0.54	0.00
Sat Flow, veh/h			3408	1845	3689	0
Grp Volume(v), veh/h			712	700	886	0
Grp Sat Flow(s),veh/h/ln			1704	1845	1752	0
Q Serve(g_s), s			8.7	2.4	7.3	0.0
Cycle Q Clear(g_c), s			8.7	2.4	7.3	0.0
Prop In Lane			1.00			0.00
Lane Grp Cap(c), veh/h			988	1686	1886	0
V/C Ratio(X)			0.72	0.42	0.47	0.00
Avail Cap(c_a), veh/h			2856	3805	3991	0
HCM Platoon Ratio			1.00	1.00	1.00	1.00
Upstream Filter(I)			1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh			14.8	0.3	6.6	0.0
Incr Delay (d2), s/veh			1.0	0.2	0.2	0.0
Initial Q Delay(d3),s/veh			0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln			4.2	1.0	3.5	0.0
LnGrp Delay(d),s/veh			15.8	0.4	6.8	0.0
LnGrp LOS			B	A	A	
Approach Vol, veh/h				1412	886	
Approach Delay, s/veh				8.2	6.8	
Approach LOS				A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		
Phs Duration (G+Y+Rc), s		46.5			17.5	29.1		
Change Period (Y+Rc), s		4.0			4.0	4.0		
Max Green Setting (Gmax), s		96.0			39.0	53.0		
Max Q Clear Time (g_c+I1), s		4.4			10.7	9.3		
Green Ext Time (p_c), s		17.8			2.8	15.8		

Intersection Summary	
HCM 2010 Ctrl Delay	7.7
HCM 2010 LOS	A

HCM 2010 Signalized Intersection Summary
2: Hillcrest Ave & SR 4 EB Ramps

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	142	1	687	0	0	0	0	1155	395	168	635	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1845				0	1845	1900	1845	1845	0
Adj Flow Rate, veh/h	154	1	747				0	1255	429	183	690	0
Adj No. of Lanes	0	1	2				0	3	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	511	3	808				0	1662	567	221	2166	0
Arrive On Green	0.29	0.29	0.29				0.00	0.45	0.45	0.13	0.62	0.00
Sat Flow, veh/h	1746	11	2760				0	3879	1266	1757	3597	0
Grp Volume(v), veh/h	155	0	747				0	1135	549	183	690	0
Grp Sat Flow(s),veh/h/ln	1757	0	1380				0	1679	1621	1757	1752	0
Q Serve(g_s), s	6.1	0.0	23.5				0.0	25.2	25.3	9.1	8.4	0.0
Cycle Q Clear(g_c), s	6.1	0.0	23.5				0.0	25.2	25.3	9.1	8.4	0.0
Prop In Lane	0.99		1.00				0.00		0.78	1.00		0.00
Lane Grp Cap(c), veh/h	514	0	808				0	1503	726	221	2166	0
V/C Ratio(X)	0.30	0.00	0.93				0.00	0.75	0.76	0.83	0.32	0.00
Avail Cap(c_a), veh/h	530	0	833				0	1613	779	353	2546	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.6	0.0	30.7				0.0	20.6	20.6	38.2	8.1	0.0
Incr Delay (d2), s/veh	0.3	0.0	15.7				0.0	1.9	4.0	8.7	0.1	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
%ile BackOfQ(50%),veh/ln	3.0	0.0	10.7				0.0	12.1	12.1	5.0	4.1	0.0
LnGrp Delay(d),s/veh	24.9	0.0	46.4				0.0	22.6	24.7	46.9	8.2	0.0
LnGrp LOS	C		D					C	C	D	A	
Approach Vol, veh/h		902						1684			873	
Approach Delay, s/veh		42.7						23.2			16.3	
Approach LOS		D						C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	15.2	44.1		30.2		59.3		
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		
Max Green Setting (Gmax), s	18.0	43.0		27.0		65.0		
Max Q Clear Time (g_c+I1), s	11.1	27.3		25.5		10.4		
Green Ext Time (p_c), s	0.3	12.7		0.7		31.0		

Intersection Summary	
HCM 2010 Ctrl Delay	26.6
HCM 2010 LOS	C

HCM 2010 Signalized Intersection Summary
3: Hillcrest Ave & Laurel Road

10/24/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	92	31	70	38	31	171	64	418	33	74	385	86
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1845	1845	1900	1845	1845	1845	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	100	34	76	41	34	106	70	454	0	80	418	93
Adj No. of Lanes	1	1	0	1	1	1	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	437	98	220	389	357	304	101	1339	0	110	1107	244
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.06	0.38	0.00	0.06	0.39	0.39
Sat Flow, veh/h	1232	508	1136	1266	1845	1568	1757	3597	0	1757	2856	630
Grp Volume(v), veh/h	100	0	110	41	34	106	70	454	0	80	255	256
Grp Sat Flow(s),veh/h/ln	1232	0	1644	1266	1845	1568	1757	1752	0	1757	1752	1733
Q Serve(g_s), s	2.4	0.0	1.9	1.0	0.5	1.9	1.3	3.1	0.0	1.5	3.5	3.5
Cycle Q Clear(g_c), s	2.9	0.0	1.9	2.9	0.5	1.9	1.3	3.1	0.0	1.5	3.5	3.5
Prop In Lane	1.00		0.69	1.00		1.00	1.00		0.00	1.00		0.36
Lane Grp Cap(c), veh/h	437	0	318	389	357	304	101	1339	0	110	679	672
V/C Ratio(X)	0.23	0.00	0.35	0.11	0.10	0.35	0.70	0.34	0.00	0.72	0.38	0.38
Avail Cap(c_a), veh/h	1348	0	1535	1325	1722	1464	899	4117	0	952	2111	2088
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.2	0.0	11.6	12.8	11.0	11.6	15.4	7.3	0.0	15.3	7.3	7.3
Incr Delay (d2), s/veh	0.3	0.0	0.6	0.1	0.1	0.7	8.3	0.1	0.0	8.6	0.3	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.9	0.3	0.3	0.9	0.9	1.5	0.0	1.0	1.7	1.7
LnGrp Delay(d),s/veh	12.5	0.0	12.2	12.9	11.1	12.3	23.7	7.4	0.0	23.9	7.6	7.7
LnGrp LOS	B		B	B	B	B	C	A		C	A	A
Approach Vol, veh/h		210			181			524			591	
Approach Delay, s/veh		12.3			12.2			9.6			9.8	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.1	16.7		10.4	5.9	16.9		10.4
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	18.0	39.0		31.0	17.0	40.0		31.0
Max Q Clear Time (g_c+I1), s	3.5	5.1		4.9	3.3	5.5		4.9
Green Ext Time (p_c), s	0.1	7.3		1.7	0.1	7.3		1.7

Intersection Summary	
HCM 2010 Ctrl Delay	10.4
HCM 2010 LOS	B

HCM 2010 Signalized Intersection Summary
5: SR 4 EB On-Ramps/SR 4 EB Off-Ramps & Laurel Road

10/24/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	0	573	0	0	0	529	1	0
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1900	0	1845	1900				1845	1845	1900
Adj Flow Rate, veh/h	0	0	0	0	0	0				576	0	0
Adj No. of Lanes	0	2	0	0	2	0				2	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	0	3	3				3	3	3
Cap, veh/h	0	47	0	0	47	0				1649	866	0
Arrive On Green	0.00	0.00	0.00	0.00	0.00	0.00				0.47	0.00	0.00
Sat Flow, veh/h	0	-71942	0	0	-71942	0				3514	1845	0
Grp Volume(v), veh/h	0	0	0	0	0	0				576	0	0
Grp Sat Flow(s),veh/h/ln	0	1752	0	0	1752	0				1757	1845	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0				0.8	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0				0.8	0.0	0.0
Prop In Lane	0.00		0.00	0.00		0.00				1.00		0.00
Lane Grp Cap(c), veh/h	0	47	0	0	47	0				1649	866	0
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00				0.35	0.00	0.00
Avail Cap(c_a), veh/h	0	16741	0	0	16741	0				26107	13706	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	0.00	0.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				1.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.1	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
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0				0.3	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				1.4	0.0	0.0
LnGrp LOS										A		
Approach Vol, veh/h		0			0						576	
Approach Delay, s/veh		0.0			0.0						1.4	
Approach LOS											A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				0.0		7.5		0.0
Change Period (Y+Rc), s				4.0		4.0		4.0
Max Green Setting (Gmax), s				36.0		56.0		36.0
Max Q Clear Time (g_c+I1), s				0.0		2.8		0.0
Green Ext Time (p_c), s				0.0		2.3		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	1.4
HCM 2010 LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

HCM 2010 Signalized Intersection Summary
6: SR 4 WB Off-Ramps/SR 4 WB On-Ramps & Laurel Road

10/24/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	4	529	0	0	571	725	2	0	318	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	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			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1845	1845	0	0	1845	1845	1900	1845	1845			
Adj Flow Rate, veh/h	4	575	0	0	621	0	2	0	346			
Adj No. of Lanes	1	2	0	0	2	1	0	1	1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	8	1855	0	0	1502	672	488	0	435			
Arrive On Green	0.00	0.53	0.00	0.00	0.43	0.00	0.28	0.00	0.28			
Sat Flow, veh/h	1757	3597	0	0	3597	1568	1757	0	1568			
Grp Volume(v), veh/h	4	575	0	0	621	0	2	0	346			
Grp Sat Flow(s),veh/h/ln	1757	1752	0	0	1752	1568	1757	0	1568			
Q Serve(g_s), s	0.1	3.8	0.0	0.0	5.1	0.0	0.0	0.0	8.5			
Cycle Q Clear(g_c), s	0.1	3.8	0.0	0.0	5.1	0.0	0.0	0.0	8.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	8	1855	0	0	1502	672	488	0	435			
V/C Ratio(X)	0.52	0.31	0.00	0.00	0.41	0.00	0.00	0.00	0.80			
Avail Cap(c_a), veh/h	170	4652	0	0	3976	1779	1569	0	1400			
HCM Platoon Ratio	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	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	20.6	5.5	0.0	0.0	8.2	0.0	10.8	0.0	13.9			
Incr Delay (d2), s/veh	46.2	0.1	0.0	0.0	0.2	0.0	0.0	0.0	3.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.1	1.9	0.0	0.0	2.5	0.0	0.0	0.0	4.1			
LnGrp Delay(d),s/veh	66.8	5.6	0.0	0.0	8.4	0.0	10.8	0.0	17.2			
LnGrp LOS	E	A			A		B		B			
Approach Vol, veh/h		579			621			348				
Approach Delay, s/veh		6.0			8.4			17.2				
Approach LOS		A			A			B				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		15.5		25.9			4.2	21.8
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		37.0		55.0			4.0	47.0
Max Q Clear Time (g_c+I1), s		10.5		5.8			2.1	7.1
Green Ext Time (p_c), s		1.2		11.0			0.0	10.7

Intersection Summary	
HCM 2010 Ctrl Delay	9.5
HCM 2010 LOS	A

HCM 2010 Signalized Intersection Summary
7: SR 4 EB On-ramps/SR 4 EB Off-Ramps & Lone Tree Way

10/24/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	824	444	95	1189	0	0	0	0	307	1	401
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1845	1845	1845	0				1845	1845	1845
Adj Flow Rate, veh/h	0	896	483	103	1292	0				335	0	436
Adj No. of Lanes	0	3	1	2	3	0				2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	2268	706	174	2810	0				1155	0	515
Arrive On Green	0.00	0.45	0.45	0.05	0.56	0.00				0.33	0.00	0.33
Sat Flow, veh/h	0	5202	1568	3408	5202	0				3514	0	1568
Grp Volume(v), veh/h	0	896	483	103	1292	0				335	0	436
Grp Sat Flow(s),veh/h/ln	0	1679	1568	1704	1679	0				1757	0	1568
Q Serve(g_s), s	0.0	8.4	17.3	2.1	10.8	0.0				5.0	0.0	18.3
Cycle Q Clear(g_c), s	0.0	8.4	17.3	2.1	10.8	0.0				5.0	0.0	18.3
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2268	706	174	2810	0				1155	0	515
V/C Ratio(X)	0.00	0.40	0.68	0.59	0.46	0.00				0.29	0.00	0.85
Avail Cap(c_a), veh/h	0	2424	755	338	3209	0				2338	0	1043
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	13.0	15.4	32.8	9.3	0.0				17.6	0.0	22.0
Incr Delay (d2), s/veh	0.0	0.1	2.4	3.2	0.1	0.0				0.1	0.0	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.9	7.8	1.1	4.9	0.0				2.4	0.0	8.4
LnGrp Delay(d),s/veh	0.0	13.1	17.8	36.0	9.4	0.0				17.7	0.0	26.0
LnGrp LOS		B	B	D	A					B		C
Approach Vol, veh/h		1379			1395						771	
Approach Delay, s/veh		14.7			11.4						22.4	
Approach LOS		B			B						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			7.6	35.8		27.2		43.4
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			7.0	34.0		47.0		45.0
Max Q Clear Time (g_c+I1), s			4.1	19.3		20.3		12.8
Green Ext Time (p_c), s			0.1	12.5		2.9		23.8

Intersection Summary	
HCM 2010 Ctrl Delay	15.1
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (veh/h)	0	962	190	8	3	856	307	432	19	138	0	0
Number	7	4	14		3	8	18	5	2	12		
Initial Q (Qb), veh	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		
Parking Bus, Adj	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	0	1845	1845		1845	1845	1845	1845	1845	1845		
Adj Flow Rate, veh/h	0	1046	104		3	930	334	485	0	145		
Adj No. of Lanes	0	3	1		1	3	1	2	0	1		
Peak Hour Factor	0.92	0.92	0.92		0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	0	3	3		3	3	3	3	3	3		
Cap, veh/h	0	2777	865		6	3187	992	740	0	330		
Arrive On Green	0.00	0.55	0.55		0.00	0.63	0.63	0.21	0.00	0.21		
Sat Flow, veh/h	0	5202	1568		1757	5036	1568	3514	0	1568		
Grp Volume(v), veh/h	0	1046	104		3	930	334	485	0	145		
Grp Sat Flow(s),veh/h/ln	0	1679	1568		1757	1679	1568	1757	0	1568		
Q Serve(g_s), s	0.0	6.0	1.6		0.1	4.3	5.1	6.5	0.0	4.1		
Cycle Q Clear(g_c), s	0.0	6.0	1.6		0.1	4.3	5.1	6.5	0.0	4.1		
Prop In Lane	0.00		1.00		1.00		1.00	1.00		1.00		
Lane Grp Cap(c), veh/h	0	2777	865		6	3187	992	740	0	330		
V/C Ratio(X)	0.00	0.38	0.12		0.52	0.29	0.34	0.66	0.00	0.44		
Avail Cap(c_a), veh/h	0	4136	1288		206	5120	1594	2748	0	1226		
HCM Platoon Ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	0.00	1.00	1.00		1.00	1.00	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	0.0	6.5	5.5		25.4	4.2	4.4	18.5	0.0	17.6		
Incr Delay (d2), s/veh	0.0	0.1	0.1		58.5	0.1	0.2	1.0	0.0	0.9		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	0.0	2.7	0.7		0.1	1.9	2.2	3.2	0.0	1.9		
LnGrp Delay(d),s/veh	0.0	6.6	5.6		84.0	4.3	4.6	19.5	0.0	18.5		
LnGrp LOS		A	A		F	A	A	B		B		
Approach Vol, veh/h		1150				1267			630			
Approach Delay, s/veh		6.5				4.5			19.2			
Approach LOS		A				A			B			

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		14.8	4.2	32.2				36.4
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		40.0	6.0	42.0				52.0
Max Q Clear Time (g_c+I1), s		8.5	2.1	8.0				7.1
Green Ext Time (p_c), s		2.3	0.0	20.2				23.4

Intersection Summary	
HCM 2010 Ctrl Delay	8.3
HCM 2010 LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Movement	SBR
Lane Configurations	
Volume (veh/h)	0
Number	
Initial Q (Qb), veh	
Ped-Bike Adj(A_pbT)	
Parking Bus, Adj	
Adj Sat Flow, veh/h/ln	
Adj Flow Rate, veh/h	
Adj No. of Lanes	
Peak Hour Factor	
Percent Heavy Veh, %	
Cap, veh/h	
Arrive On Green	
Sat Flow, veh/h	
Grp Volume(v), veh/h	
Grp Sat Flow(s),veh/h/ln	
Q Serve(g_s), s	
Cycle Q Clear(g_c), s	
Prop In Lane	
Lane Grp Cap(c), veh/h	
V/C Ratio(X)	
Avail Cap(c_a), veh/h	
HCM Platoon Ratio	
Upstream Filter(I)	
Uniform Delay (d), s/veh	
Incr Delay (d2), s/veh	
Initial Q Delay(d3),s/veh	
%ile BackOfQ(50%),veh/ln	
LnGrp Delay(d),s/veh	
LnGrp LOS	
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	

Timer

User approved ignoring U-Turning movement.

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Volume (veh/h)	43	141	466	41	61	608	88	15	107	88	47	25
Number		7	4	14	3	8	18		5	2	12	
Initial Q (Qb), veh		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	
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Adj Sat Flow, veh/h/ln		1845	1845	1845	1845	1845	1845		1845	1845	1845	
Adj Flow Rate, veh/h		153	507	23	66	661	48		116	96	26	
Adj No. of Lanes		1	3	1	1	3	1		2	1	1	
Peak Hour Factor		0.92	0.92	0.92	0.92	0.92	0.92		0.92	0.92	0.92	
Percent Heavy Veh, %		3	3	3	3	3	3		3	3	3	
Cap, veh/h		204	1903	593	87	1568	488		227	299	254	
Arrive On Green		0.12	0.38	0.38	0.05	0.31	0.31		0.07	0.16	0.16	
Sat Flow, veh/h		1757	5036	1568	1757	5036	1568		3408	1845	1568	
Grp Volume(v), veh/h		153	507	23	66	661	48		116	96	26	
Grp Sat Flow(s),veh/h/ln		1757	1679	1568	1757	1679	1568		1704	1845	1568	
Q Serve(g_s), s		3.9	3.2	0.4	1.7	4.8	1.0		1.5	2.1	0.7	
Cycle Q Clear(g_c), s		3.9	3.2	0.4	1.7	4.8	1.0		1.5	2.1	0.7	
Prop In Lane		1.00		1.00	1.00		1.00		1.00		1.00	
Lane Grp Cap(c), veh/h		204	1903	593	87	1568	488		227	299	254	
V/C Ratio(X)		0.75	0.27	0.04	0.76	0.42	0.10		0.51	0.32	0.10	
Avail Cap(c_a), veh/h		867	3999	1245	490	2918	909		805	910	774	
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Upstream Filter(I)		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Uniform Delay (d), s/veh		20.0	10.0	9.2	21.9	12.7	11.4		21.0	17.3	16.6	
Incr Delay (d2), s/veh		5.5	0.1	0.0	12.8	0.2	0.1		1.8	0.6	0.2	
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln		2.2	1.5	0.2	1.1	2.2	0.4		0.8	1.1	0.3	
LnGrp Delay(d),s/veh		25.5	10.1	9.2	34.7	12.9	11.5		22.8	17.9	16.8	
LnGrp LOS		C	B	A	C	B	B		C	B	B	
Approach Vol, veh/h			683			775				238		
Approach Delay, s/veh			13.5			14.7				20.1		
Approach LOS			B			B				C		

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.1	11.6	6.3	21.6	7.1	11.6	9.4	18.5
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	11.0	23.0	13.0	37.0	11.0	23.0	23.0	27.0
Max Q Clear Time (g_c+I1), s	3.6	4.1	3.7	5.2	3.5	5.6	5.9	6.8
Green Ext Time (p_c), s	0.2	2.0	0.1	9.0	0.2	2.0	0.3	7.7

Intersection Summary	
HCM 2010 Ctrl Delay	16.0
HCM 2010 LOS	B

Notes

User approved ignoring U-Turning movement.

Movement	SBL	SBT	SBR
Lane Configurations			
Volume (veh/h)	109	126	122
Number	1	6	16
Initial Q (Qb), veh	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900
Adj Flow Rate, veh/h	118	137	133
Adj No. of Lanes	2	2	0
Peak Hour Factor	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3
Cap, veh/h	229	285	255
Arrive On Green	0.07	0.16	0.16
Sat Flow, veh/h	3408	1752	1568
Grp Volume(v), veh/h	118	137	133
Grp Sat Flow(s),veh/h/ln	1704	1752	1568
Q Serve(g_s), s	1.6	3.3	3.6
Cycle Q Clear(g_c), s	1.6	3.3	3.6
Prop In Lane	1.00		1.00
Lane Grp Cap(c), veh/h	229	285	255
V/C Ratio(X)	0.52	0.48	0.52
Avail Cap(c_a), veh/h	805	865	774
HCM Platoon Ratio	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.0	17.7	17.8
Incr Delay (d2), s/veh	1.8	1.3	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	1.7	1.7
LnGrp Delay(d),s/veh	22.8	19.0	19.5
LnGrp LOS	C	B	B
Approach Vol, veh/h		388	
Approach Delay, s/veh		20.3	
Approach LOS		C	

Timer

HCM 2010 Signalized Intersection Summary
1: Hillcrest Ave & SR4 WB Ramps

10/24/2015

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	648	554	874	141
Number			5	2	6	16
Initial Q (Qb), veh			0	0	0	0
Ped-Bike Adj(A_pbT)			1.00			1.00
Parking Bus, Adj			1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln			1845	1845	1845	1900
Adj Flow Rate, veh/h			704	602	950	0
Adj No. of Lanes			2	1	2	0
Peak Hour Factor			0.92	0.92	0.92	0.92
Percent Heavy Veh, %			3	3	3	3
Cap, veh/h			978	1686	1897	0
Arrive On Green			0.29	0.91	0.54	0.00
Sat Flow, veh/h			3408	1845	3689	0
Grp Volume(v), veh/h			704	602	950	0
Grp Sat Flow(s),veh/h/ln			1704	1845	1752	0
Q Serve(g_s), s			8.6	1.9	7.9	0.0
Cycle Q Clear(g_c), s			8.6	1.9	7.9	0.0
Prop In Lane			1.00			0.00
Lane Grp Cap(c), veh/h			978	1686	1897	0
V/C Ratio(X)			0.72	0.36	0.50	0.00
Avail Cap(c_a), veh/h			2711	3807	4144	0
HCM Platoon Ratio			1.00	1.00	1.00	1.00
Upstream Filter(I)			1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh			14.9	0.3	6.7	0.0
Incr Delay (d2), s/veh			1.0	0.1	0.2	0.0
Initial Q Delay(d3),s/veh			0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln			4.1	0.9	3.7	0.0
LnGrp Delay(d),s/veh			15.9	0.4	6.9	0.0
LnGrp LOS			B	A	A	
Approach Vol, veh/h				1306	950	
Approach Delay, s/veh				8.8	6.9	
Approach LOS				A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		
Phs Duration (G+Y+Rc), s		46.5			17.3	29.2		
Change Period (Y+Rc), s		4.0			4.0	4.0		
Max Green Setting (Gmax), s		96.0			37.0	55.0		
Max Q Clear Time (g_c+I1), s		3.9			10.6	9.9		
Green Ext Time (p_c), s		16.9			2.7	15.2		

Intersection Summary		
HCM 2010 Ctrl Delay		8.0
HCM 2010 LOS		A

HCM 2010 Signalized Intersection Summary
2: Hillcrest Ave & SR 4 EB Ramps

10/24/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	122	0	730	0	0	0	0	1082	398	182	686	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1845				0	1845	1900	1845	1845	0
Adj Flow Rate, veh/h	128	0	768				0	1139	419	192	722	0
Adj No. of Lanes	0	1	2				0	3	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	540	0	848				0	1538	566	231	2107	0
Arrive On Green	0.31	0.00	0.31				0.00	0.42	0.42	0.13	0.60	0.00
Sat Flow, veh/h	1757	0	2760				0	3797	1335	1757	3597	0
Grp Volume(v), veh/h	128	0	768				0	1053	505	192	722	0
Grp Sat Flow(s),veh/h/ln	1757	0	1380				0	1679	1609	1757	1752	0
Q Serve(g_s), s	4.7	0.0	23.3				0.0	23.0	23.0	9.3	9.0	0.0
Cycle Q Clear(g_c), s	4.7	0.0	23.3				0.0	23.0	23.0	9.3	9.0	0.0
Prop In Lane	1.00		1.00				0.00		0.83	1.00		0.00
Lane Grp Cap(c), veh/h	540	0	848				0	1422	682	231	2107	0
V/C Ratio(X)	0.24	0.00	0.91				0.00	0.74	0.74	0.83	0.34	0.00
Avail Cap(c_a), veh/h	584	0	918				0	1540	738	383	2532	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.6	0.0	29.0				0.0	21.1	21.1	36.9	8.7	0.0
Incr Delay (d2), s/veh	0.2	0.0	11.9				0.0	1.8	3.7	7.6	0.1	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
%ile BackOfQ(50%),veh/ln	2.3	0.0	10.3				0.0	10.9	10.8	5.0	4.3	0.0
LnGrp Delay(d),s/veh	22.8	0.0	40.9				0.0	22.9	24.8	44.5	8.8	0.0
LnGrp LOS	C		D					C	C	D	A	
Approach Vol, veh/h		896						1558			914	
Approach Delay, s/veh		38.3						23.5			16.3	
Approach LOS		D						C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	15.5	40.9		30.8		56.4		
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		
Max Green Setting (Gmax), s	19.0	40.0		29.0		63.0		
Max Q Clear Time (g_c+I1), s	11.3	25.0		25.3		11.0		
Green Ext Time (p_c), s	0.3	12.0		1.5		28.3		

Intersection Summary		
HCM 2010 Ctrl Delay		25.5
HCM 2010 LOS		C

HCM 2010 Signalized Intersection Summary
3: Hillcrest Ave & Laurel Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	27	8	28	24	11	113	27	425	31	139	452	38
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1845	1845	1900	1845	1845	1845	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	28	8	29	25	12	60	28	447	0	146	476	40
Adj No. of Lanes	1	1	0	1	1	1	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	359	34	125	342	181	154	49	1378	0	197	1564	131
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.03	0.39	0.00	0.11	0.48	0.48
Sat Flow, veh/h	1310	350	1270	1352	1845	1568	1757	3597	0	1757	3274	274
Grp Volume(v), veh/h	28	0	37	25	12	60	28	447	0	146	254	262
Grp Sat Flow(s),veh/h/ln	1310	0	1621	1352	1845	1568	1757	1752	0	1757	1752	1796
Q Serve(g_s), s	0.6	0.0	0.6	0.5	0.2	1.1	0.5	2.7	0.0	2.4	2.7	2.7
Cycle Q Clear(g_c), s	0.8	0.0	0.6	1.2	0.2	1.1	0.5	2.7	0.0	2.4	2.7	2.7
Prop In Lane	1.00		0.78	1.00		1.00	1.00		0.00	1.00		0.15
Lane Grp Cap(c), veh/h	359	0	159	342	181	154	49	1378	0	197	837	858
V/C Ratio(X)	0.08	0.00	0.23	0.07	0.07	0.39	0.57	0.32	0.00	0.74	0.30	0.31
Avail Cap(c_a), veh/h	1269	0	1285	1281	1462	1243	580	4399	0	1509	3126	3204
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.7	0.0	12.6	13.1	12.4	12.8	14.5	6.4	0.0	13.0	4.8	4.8
Incr Delay (d2), s/veh	0.1	0.0	0.7	0.1	0.2	1.6	10.3	0.1	0.0	5.4	0.2	0.2
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(50%),veh/ln	0.2	0.0	0.3	0.2	0.1	0.5	0.4	1.3	0.0	1.5	1.3	1.4
LnGrp Delay(d),s/veh	12.8	0.0	13.3	13.2	12.5	14.4	24.8	6.5	0.0	18.4	5.0	5.0
LnGrp LOS	B		B	B	B	B	C	A		B	A	A
Approach Vol, veh/h		65			97			475			662	
Approach Delay, s/veh		13.1			13.9			7.6			8.0	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.4	15.9		7.0	4.8	18.5		7.0
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	26.0	38.0		24.0	10.0	54.0		24.0
Max Q Clear Time (g_c+I1), s	4.4	4.7		2.8	2.5	4.7		3.2
Green Ext Time (p_c), s	0.4	7.2		0.6	0.0	7.6		0.5

Intersection Summary			
HCM 2010 Ctrl Delay			8.5
HCM 2010 LOS			A

HCM 2010 Signalized Intersection Summary
5: SR 4 EB On-Ramps/SR 4 EB Off-Ramps & Laurel Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	0	424	0	0	0	1054	2	2
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1900	0	1845	1900				1845	1845	1900
Adj Flow Rate, veh/h	0	0	0	0	0	0				1149	0	0
Adj No. of Lanes	0	2	0	0	2	0				2	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	0	3	3				3	3	3
Cap, veh/h	0	26	0	0	26	0				2456	1289	0
Arrive On Green	0.00	0.00	0.00	0.00	0.00	0.00				0.70	0.00	0.00
Sat Flow, veh/h	0	-71942	0	0	-71942	0				3514	1845	0
Grp Volume(v), veh/h	0	0	0	0	0	0				1149	0	0
Grp Sat Flow(s),veh/h/ln	0	1752	0	0	1752	0				1757	1845	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0				1.9	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0				1.9	0.0	0.0
Prop In Lane	0.00		0.00	0.00		0.00				1.00		0.00
Lane Grp Cap(c), veh/h	0	26	0	0	26	0				2456	1289	0
V/C Ratio(X)	0.00	0.00	0.00	0.00	0.00	0.00				0.47	0.00	0.00
Avail Cap(c_a), veh/h	0	5805	0	0	5805	0				18516	9721	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	0.00	0.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.1	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
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.0	0.0				0.8	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				1.0	0.0	0.0
LnGrp LOS										A		
Approach Vol, veh/h		0			0						1149	
Approach Delay, s/veh		0.0			0.0						1.0	
Approach LOS											A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				0.0		13.3		0.0
Change Period (Y+Rc), s				4.0		4.0		4.0
Max Green Setting (Gmax), s				22.0		70.0		22.0
Max Q Clear Time (g_c+I1), s				0.0		3.9		0.0
Green Ext Time (p_c), s				0.0		5.5		0.0

Intersection Summary			
HCM 2010 Ctrl Delay			1.0
HCM 2010 LOS			A

Notes

User approved volume balancing among the lanes for turning movement.

HCM 2010 Signalized Intersection Summary
6: SR 4 WB Off-Ramps/SR 4 WB On-Ramps & Laurel Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	4	1050	0	0	419	465	5	0	497	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	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			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1845	1845	0	0	1845	1845	1900	1845	1845			
Adj Flow Rate, veh/h	4	1141	0	0	455	0	5	0	540			
Adj No. of Lanes	1	2	0	0	2	1	0	1	1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	8	1703	0	0	1466	656	681	0	608			
Arrive On Green	0.00	0.49	0.00	0.00	0.42	0.00	0.39	0.00	0.39			
Sat Flow, veh/h	1757	3597	0	0	3597	1568	1757	0	1568			
Grp Volume(v), veh/h	4	1141	0	0	455	0	5	0	540			
Grp Sat Flow(s),veh/h/ln	1757	1752	0	0	1752	1568	1757	0	1568			
Q Serve(g_s), s	0.1	15.7	0.0	0.0	5.5	0.0	0.1	0.0	20.3			
Cycle Q Clear(g_c), s	0.1	15.7	0.0	0.0	5.5	0.0	0.1	0.0	20.3			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	8	1703	0	0	1466	656	681	0	608			
V/C Ratio(X)	0.53	0.67	0.00	0.00	0.31	0.00	0.01	0.00	0.89			
Avail Cap(c_a), veh/h	111	2328	0	0	1885	843	1389	0	1240			
HCM Platoon Ratio	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	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	31.4	12.4	0.0	0.0	12.3	0.0	11.9	0.0	18.1			
Incr Delay (d2), s/veh	47.6	0.5	0.0	0.0	0.1	0.0	0.0	0.0	4.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.2	7.6	0.0	0.0	2.7	0.0	0.1	0.0	9.5			
LnGrp Delay(d),s/veh	79.0	12.8	0.0	0.0	12.4	0.0	11.9	0.0	22.8			
LnGrp LOS	E	B			B		B		C			
Approach Vol, veh/h		1145			455			545				
Approach Delay, s/veh		13.1			12.4			22.7				
Approach LOS		B			B			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		28.5		34.7			4.3	30.5
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		50.0		42.0			4.0	34.0
Max Q Clear Time (g_c+I1), s		22.3		17.7			2.1	7.5
Green Ext Time (p_c), s		2.2		13.0			0.0	13.7

Intersection Summary			
HCM 2010 Ctrl Delay			15.4
HCM 2010 LOS			B

HCM 2010 Signalized Intersection Summary
7: SR 4 EB On-ramps/SR 4 EB Off-Ramps & Lone Tree Way

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1443	504	120	1414	0	0	0	0	454	2	401
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1845	1845	1845	0				1845	1845	1845
Adj Flow Rate, veh/h	0	1519	531	126	2828	0				479	0	422
Adj No. of Lanes	0	3	1	2	3	0				2	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.50	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	2443	761	197	2973	0				1106	0	494
Arrive On Green	0.00	0.49	0.49	0.06	0.59	0.00				0.31	0.00	0.31
Sat Flow, veh/h	0	5202	1568	3408	5202	0				3514	0	1568
Grp Volume(v), veh/h	0	1519	531	126	2828	0				479	0	422
Grp Sat Flow(s),veh/h/ln	0	1679	1568	1704	1679	0				1757	0	1568
Q Serve(g_s), s	0.0	18.7	22.2	3.0	44.2	0.0				9.1	0.0	21.3
Cycle Q Clear(g_c), s	0.0	18.7	22.2	3.0	44.2	0.0				9.1	0.0	21.3
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2443	761	197	2973	0				1106	0	494
V/C Ratio(X)	0.00	0.62	0.70	0.64	0.95	0.00				0.43	0.00	0.86
Avail Cap(c_a), veh/h	0	2443	761	323	3047	0				1709	0	763
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	16.0	16.9	38.9	16.1	0.0				22.9	0.0	27.1
Incr Delay (d2), s/veh	0.0	0.5	2.8	3.4	7.7	0.0				0.3	0.0	5.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.7	10.2	1.5	22.3	0.0				4.4	0.0	10.0
LnGrp Delay(d),s/veh	0.0	16.5	19.7	42.3	23.9	0.0				23.2	0.0	33.0
LnGrp LOS		B	B	D	C					C		C
Approach Vol, veh/h		2050			2954						901	
Approach Delay, s/veh		17.3			24.7						27.8	
Approach LOS		B			C						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			8.9	44.9		30.5		53.8
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			8.0	39.0		41.0		51.0
Max Q Clear Time (g_c+I1), s			5.0	24.2		23.3		46.2
Green Ext Time (p_c), s			0.1	14.7		3.3		3.5

Intersection Summary			
HCM 2010 Ctrl Delay			22.6
HCM 2010 LOS			C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (veh/h)	0	1616	301	20	5	1001	372	551	29	189	0	0
Number	7	4	14		3	8	18	5	2	12		
Initial Q (Qb), veh	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		
Parking Bus, Adj	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	0	1845	1845		1845	1845	1845	1845	1845	1845		
Adj Flow Rate, veh/h	0	1701	170		5	1054	392	602	0	197		
Adj No. of Lanes	0	3	1		1	3	1	2	0	1		
Peak Hour Factor	0.95	0.95	0.95		0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	0	3	3		3	3	3	3	3	3		
Cap, veh/h	0	3014	938		9	3322	1034	803	0	358		
Arrive On Green	0.00	0.60	0.60		0.01	0.66	0.66	0.23	0.00	0.23		
Sat Flow, veh/h	0	5202	1568		1757	5036	1568	3514	0	1568		
Grp Volume(v), veh/h	0	1701	170		5	1054	392	602	0	197		
Grp Sat Flow(s),veh/h/ln	0	1679	1568		1757	1679	1568	1757	0	1568		
Q Serve(g_s), s	0.0	14.6	3.5		0.2	6.4	8.1	11.4	0.0	7.9		
Cycle Q Clear(g_c), s	0.0	14.6	3.5		0.2	6.4	8.1	11.4	0.0	7.9		
Prop In Lane	0.00		1.00		1.00		1.00	1.00		1.00		
Lane Grp Cap(c), veh/h	0	3014	938		9	3322	1034	803	0	358		
V/C Ratio(X)	0.00	0.56	0.18		0.54	0.32	0.38	0.75	0.00	0.55		
Avail Cap(c_a), veh/h	0	3380	1053		98	3944	1228	1769	0	789		
HCM Platoon Ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	0.00	1.00	1.00		1.00	1.00	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	0.0	8.7	6.5		35.5	5.2	5.5	25.7	0.0	24.3		
Incr Delay (d2), s/veh	0.0	0.2	0.1		40.8	0.1	0.2	1.4	0.0	1.3		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	0.0	6.7	1.5		0.2	2.9	3.6	5.7	0.0	3.5		
LnGrp Delay(d),s/veh	0.0	8.9	6.6		76.2	5.3	5.8	27.1	0.0	25.7		
LnGrp LOS		A	A		E	A	A	C		C		
Approach Vol, veh/h		1871				1451			799			
Approach Delay, s/veh		8.7				5.7			26.8			
Approach LOS		A				A			C			

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.3	4.4	46.8				51.2
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		36.0	4.0	48.0				56.0
Max Q Clear Time (g_c+I1), s		13.4	2.2	16.6				10.1
Green Ext Time (p_c), s		2.9	0.0	26.1				35.6

Intersection Summary		
HCM 2010 Ctrl Delay		11.1
HCM 2010 LOS		B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	SBR
Lane Configurations	
Volume (veh/h)	0
Number	
Initial Q (Qb), veh	
Ped-Bike Adj(A_pbT)	
Parking Bus, Adj	
Adj Sat Flow, veh/h/ln	
Adj Flow Rate, veh/h	
Adj No. of Lanes	
Peak Hour Factor	
Percent Heavy Veh, %	
Cap, veh/h	
Arrive On Green	
Sat Flow, veh/h	
Grp Volume(v), veh/h	
Grp Sat Flow(s),veh/h/ln	
Q Serve(g_s), s	
Cycle Q Clear(g_c), s	
Prop In Lane	
Lane Grp Cap(c), veh/h	
V/C Ratio(X)	
Avail Cap(c_a), veh/h	
HCM Platoon Ratio	
Upstream Filter(I)	
Uniform Delay (d), s/veh	
Incr Delay (d2), s/veh	
Initial Q Delay(d3),s/veh	
%ile BackOfQ(50%),veh/ln	
LnGrp Delay(d),s/veh	
LnGrp LOS	
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	

Timer

User approved ignoring U-Turning movement.

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Volume (veh/h)	101	247	808	95	89	745	145	16	94	94	37	59
Number		7	4	14	3	8	18		5	2	12	
Initial Q (Qb), veh		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	
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Adj Sat Flow, veh/h/ln		1845	1845	1845	1845	1845	1845		1845	1845	1845	
Adj Flow Rate, veh/h		260	851	58	94	784	100		99	99	22	
Adj No. of Lanes		1	3	1	1	3	1		2	1	1	
Peak Hour Factor		0.95	0.95	0.95	0.95	0.95	0.95		0.95	0.95	0.95	
Percent Heavy Veh, %		3	3	3	3	3	3		3	3	3	
Cap, veh/h		322	2138	666	122	1563	487		184	248	211	
Arrive On Green		0.18	0.42	0.42	0.07	0.31	0.31		0.05	0.13	0.13	
Sat Flow, veh/h		1757	5036	1568	1757	5036	1568		3408	1845	1568	
Grp Volume(v), veh/h		260	851	58	94	784	100		99	99	22	
Grp Sat Flow(s),veh/h/ln		1757	1679	1568	1757	1679	1568		1704	1845	1568	
Q Serve(g_s), s		8.5	7.0	1.3	3.2	7.6	2.8		1.7	2.9	0.7	
Cycle Q Clear(g_c), s		8.5	7.0	1.3	3.2	7.6	2.8		1.7	2.9	0.7	
Prop In Lane		1.00		1.00	1.00		1.00		1.00		1.00	
Lane Grp Cap(c), veh/h		322	2138	666	122	1563	487		184	248	211	
V/C Ratio(X)		0.81	0.40	0.09	0.77	0.50	0.21		0.54	0.40	0.10	
Avail Cap(c_a), veh/h		790	3273	1019	351	2014	627		398	646	549	
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Upstream Filter(I)		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Uniform Delay (d), s/veh		23.5	12.0	10.3	27.5	16.9	15.2		27.7	23.8	22.8	
Incr Delay (d2), s/veh		4.8	0.1	0.1	9.9	0.3	0.2		2.5	1.0	0.2	
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln		4.5	3.3	0.6	1.9	3.5	1.2		0.9	1.6	0.3	
LnGrp Delay(d),s/veh		28.3	12.1	10.4	37.4	17.1	15.4		30.1	24.8	23.0	
LnGrp LOS		C	B	B	D	B	B		C	C	C	
Approach Vol, veh/h			1169			978				220		
Approach Delay, s/veh			15.6			18.9				27.0		
Approach LOS			B			B				C		

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	12.1	8.2	29.5	7.2	15.1	15.0	22.6
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	12.0	21.0	12.0	39.0	7.0	26.0	27.0	24.0
Max Q Clear Time (g_c+I1), s	6.0	4.9	5.2	9.0	3.7	8.5	10.5	9.6
Green Ext Time (p_c), s	0.4	2.6	0.1	13.8	0.1	2.7	0.6	9.0

Intersection Summary	
HCM 2010 Ctrl Delay	19.6
HCM 2010 LOS	B

Notes

User approved ignoring U-Turning movement.

Movement	SBL	SBT	SBR
Lane Configurations			
Volume (veh/h)	227	194	167
Number	1	6	16
Initial Q (Qb), veh	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900
Adj Flow Rate, veh/h	239	204	176
Adj No. of Lanes	2	2	0
Peak Hour Factor	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3
Cap, veh/h	359	340	279
Arrive On Green	0.11	0.19	0.19
Sat Flow, veh/h	3408	1832	1500
Grp Volume(v), veh/h	239	195	185
Grp Sat Flow(s),veh/h/ln	1704	1752	1580
Q Serve(g_s), s	4.0	6.1	6.5
Cycle Q Clear(g_c), s	4.0	6.1	6.5
Prop In Lane	1.00		0.95
Lane Grp Cap(c), veh/h	359	326	294
V/C Ratio(X)	0.67	0.60	0.63
Avail Cap(c_a), veh/h	682	759	685
HCM Platoon Ratio	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.8	22.4	22.5
Incr Delay (d2), s/veh	2.1	1.8	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	3.1	3.0
LnGrp Delay(d),s/veh	28.0	24.1	24.8
LnGrp LOS	C	C	C
Approach Vol, veh/h		619	
Approach Delay, s/veh		25.8	
Approach LOS		C	

Timer

HCM 2010 Signalized Intersection Summary
2: Hillcrest Ave & SR 4 EB Ramps

10/27/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	32	0	137	0	0	0	0	1806	503	294	569	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1845				0	1845	1900	1845	1845	0
Adj Flow Rate, veh/h	35	0	149				0	1963	547	320	618	0
Adj No. of Lanes	2	0	2				0	3	0	2	2	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	259	0	231				0	2636	702	406	2915	0
Arrive On Green	0.07	0.00	0.07				0.00	0.67	0.67	0.12	0.83	0.00
Sat Flow, veh/h	3514	0	3136				0	4127	1055	3408	3597	0
Grp Volume(v), veh/h	35	0	149				0	1650	860	320	618	0
Grp Sat Flow(s),veh/h/ln	1757	0	1568				0	1679	1659	1704	1752	0
Q Serve(g_s), s	0.8	0.0	3.9				0.0	27.4	30.5	7.7	3.0	0.0
Cycle Q Clear(g_c), s	0.8	0.0	3.9				0.0	27.4	30.5	7.7	3.0	0.0
Prop In Lane	1.00		1.00				0.00		0.64	1.00		0.00
Lane Grp Cap(c), veh/h	259	0	231				0	2234	1104	406	2915	0
V/C Ratio(X)	0.14	0.00	0.64				0.00	0.74	0.78	0.79	0.21	0.00
Avail Cap(c_a), veh/h	664	0	593				0	2339	1156	523	3146	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	36.7	0.0	38.1				0.0	9.3	9.8	36.3	1.5	0.0
Incr Delay (d2), s/veh	0.2	0.0	3.0				0.0	1.2	3.3	6.1	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
%ile BackOfQ(50%),veh/ln	0.4	0.0	1.8				0.0	12.8	14.6	4.0	1.5	0.0
LnGrp Delay(d),s/veh	36.9	0.0	41.1				0.0	10.5	13.2	42.3	1.5	0.0
LnGrp LOS	D		D					B	B	D	A	
Approach Vol, veh/h		184						2510			938	
Approach Delay, s/veh		40.3						11.4			15.4	
Approach LOS		D						B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	14.1	60.3		10.2		74.4		
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		
Max Green Setting (Gmax), s	13.0	59.0		16.0		76.0		
Max Q Clear Time (g_c+I1), s	9.7	32.5		5.9		5.0		
Green Ext Time (p_c), s	0.4	23.8		0.4		54.9		

Intersection Summary		
HCM 2010 Ctrl Delay		13.9
HCM 2010 LOS		B

Notes

User approved volume balancing among the lanes for turning movement.

HCM 2010 Signalized Intersection Summary
3: Hillcrest Ave & Laurel Road

10/27/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	121	90	85	350	80	252	98	1191	526	436	1094	145
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1845	1845	1900	1845	1845	1845	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	132	98	92	380	87	138	107	1295	0	474	1189	158
Adj No. of Lanes	1	1	0	1	1	1	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	354	248	232	299	521	443	134	1419	0	337	1619	214
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.08	0.40	0.00	0.19	0.52	0.52
Sat Flow, veh/h	1140	877	823	1177	1845	1568	1757	3597	0	1757	3112	412
Grp Volume(v), veh/h	132	0	190	380	87	138	107	1295	0	474	668	679
Grp Sat Flow(s),veh/h/ln	1140	0	1699	1177	1845	1568	1757	1752	0	1757	1752	1772
Q Serve(g_s), s	9.8	0.0	9.0	19.0	3.5	6.9	5.9	34.6	0.0	19.0	29.3	29.6
Cycle Q Clear(g_c), s	13.3	0.0	9.0	28.0	3.5	6.9	5.9	34.6	0.0	19.0	29.3	29.6
Prop In Lane	1.00		0.48	1.00		1.00	1.00		0.00	1.00		0.23
Lane Grp Cap(c), veh/h	354	0	480	299	521	443	134	1419	0	337	912	922
V/C Ratio(X)	0.37	0.00	0.40	1.27	0.17	0.31	0.80	0.91	0.00	1.41	0.73	0.74
Avail Cap(c_a), veh/h	354	0	480	299	521	443	160	1450	0	337	912	922
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.8	0.0	28.7	42.4	26.8	28.0	45.0	27.8	0.0	40.1	18.4	18.5
Incr Delay (d2), s/veh	0.7	0.0	0.5	145.9	0.1	0.4	21.1	9.0	0.0	200.3	3.1	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	4.3	20.2	1.8	3.0	3.7	18.3	0.0	27.9	14.9	15.1
LnGrp Delay(d),s/veh	32.4	0.0	29.3	188.3	26.9	28.4	66.2	36.9	0.0	240.3	21.5	21.6
LnGrp LOS	C		C	F	C	C	E	D		F	C	C
Approach Vol, veh/h		322			605			1402			1821	
Approach Delay, s/veh		30.6			128.6			39.1			78.5	
Approach LOS		C			F			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	23.0	44.1		32.0	11.5	55.6		32.0
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	19.0	41.0		28.0	9.0	51.0		28.0
Max Q Clear Time (g_c+I1), s	21.0	36.6		15.3	7.9	31.6		30.0
Green Ext Time (p_c), s	0.0	3.5		3.6	0.0	16.6		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		68.8
HCM 2010 LOS		E

HCM 2010 Signalized Intersection Summary
4: Canada Valley Road & Laurel Road

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1036	117	309	766	154	367
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1900	1845	1845	1845	1845
Adj Flow Rate, veh/h	1126	127	336	833	167	200
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	1491	168	385	2591	279	249
Arrive On Green	0.47	0.47	0.22	0.74	0.16	0.16
Sat Flow, veh/h	3269	358	1757	3597	1757	1568
Grp Volume(v), veh/h	620	633	336	833	167	200
Grp Sat Flow(s),veh/h/ln	1752	1782	1757	1752	1757	1568
Q Serve(g_s), s	22.9	23.0	14.5	6.4	6.9	9.7
Cycle Q Clear(g_c), s	22.9	23.0	14.5	6.4	6.9	9.7
Prop In Lane		0.20	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	823	836	385	2591	279	249
V/C Ratio(X)	0.75	0.76	0.87	0.32	0.60	0.80
Avail Cap(c_a), veh/h	914	929	581	3165	469	419
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.1	17.2	29.6	3.5	30.7	31.9
Incr Delay (d2), s/veh	3.2	3.2	9.4	0.1	2.1	5.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.8	12.0	8.0	3.0	3.5	4.6
LnGrp Delay(d),s/veh	20.4	20.4	39.0	3.6	32.8	37.8
LnGrp LOS	C	C	D	A	C	D
Approach Vol, veh/h	1253			1169	367	
Approach Delay, s/veh	20.4			13.8	35.5	
Approach LOS	C			B	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		16.5	21.2	40.9				62.1
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		21.0	26.0	41.0				71.0
Max Q Clear Time (g_c+I1), s		11.7	16.5	25.0				8.4
Green Ext Time (p_c), s		0.8	0.7	11.9				27.0

Intersection Summary	
HCM 2010 Ctrl Delay	19.6
HCM 2010 LOS	B

HCM 2010 Signalized Intersection Summary
5: SR 4 EB On-Ramps/SR 4 EB Off-Ramps & Laurel Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1310	90	0	557	100	0	0	0	830	0	331
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1900	0	1845	1900				1845	1845	1845
Adj Flow Rate, veh/h	0	1424	98	0	605	0				902	0	360
Adj No. of Lanes	0	2	0	0	2	0				2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	0	3	3				3	3	3
Cap, veh/h	0	1906	131	0	2007	0				1140	0	509
Arrive On Green	0.00	0.57	0.57	0.00	0.57	0.00				0.32	0.00	0.32
Sat Flow, veh/h	0	3421	228	0	3689	0				3514	0	1568
Grp Volume(v), veh/h	0	747	775	0	605	0				902	0	360
Grp Sat Flow(s),veh/h/ln	0	1752	1804	0	1752	0				1757	0	1568
Q Serve(g_s), s	0.0	24.7	25.0	0.0	6.9	0.0				18.1	0.0	15.6
Cycle Q Clear(g_c), s	0.0	24.7	25.0	0.0	6.9	0.0				18.1	0.0	15.6
Prop In Lane	0.00		0.13	0.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1003	1033	0	2007	0				1140	0	509
V/C Ratio(X)	0.00	0.74	0.75	0.00	0.30	0.00				0.79	0.00	0.71
Avail Cap(c_a), veh/h	0	1174	1209	0	2348	0				1811	0	808
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	12.4	12.4	0.0	8.6	0.0				23.8	0.0	23.0
Incr Delay (d2), s/veh	0.0	2.2	2.2	0.0	0.1	0.0				1.3	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	12.4	12.9	0.0	3.3	0.0				9.0	0.0	7.0
LnGrp Delay(d),s/veh	0.0	14.6	14.7	0.0	8.7	0.0				25.1	0.0	24.8
LnGrp LOS		B	B		A					C		C
Approach Vol, veh/h		1522			605						1262	
Approach Delay, s/veh		14.6			8.7						25.0	
Approach LOS		B			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				48.4		29.2		48.4
Change Period (Y+Rc), s				4.0		4.0		4.0
Max Green Setting (Gmax), s				52.0		40.0		52.0
Max Q Clear Time (g_c+I1), s				27.0		20.1		8.9
Green Ext Time (p_c), s				17.5		5.1		24.8

Intersection Summary	
HCM 2010 Ctrl Delay	17.4
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

HCM 2010 Signalized Intersection Summary
6: SR 4 WB Off-Ramps/SR 4 WB On-Ramps & Laurel Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	622	1454	0	0	721	310	27	0	109	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	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			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1845	1845	0	0	1845	1845	1900	1845	1845			
Adj Flow Rate, veh/h	676	1580	0	0	784	0	29	0	118			
Adj No. of Lanes	1	2	0	0	2	1	0	1	1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	735	2793	0	0	1143	511	174	0	155			
Arrive On Green	0.42	0.80	0.00	0.00	0.33	0.00	0.10	0.00	0.10			
Sat Flow, veh/h	1757	3597	0	0	3597	1568	1757	0	1568			
Grp Volume(v), veh/h	676	1580	0	0	784	0	29	0	118			
Grp Sat Flow(s),veh/h/ln	1757	1752	0	0	1752	1568	1757	0	1568			
Q Serve(g_s), s	27.9	12.8	0.0	0.0	14.9	0.0	1.2	0.0	5.6			
Cycle Q Clear(g_c), s	27.9	12.8	0.0	0.0	14.9	0.0	1.2	0.0	5.6			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	735	2793	0	0	1143	511	174	0	155			
V/C Ratio(X)	0.92	0.57	0.00	0.00	0.69	0.00	0.17	0.00	0.76			
Avail Cap(c_a), veh/h	1031	3429	0	0	1189	532	390	0	348			
HCM Platoon Ratio	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	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	21.1	2.9	0.0	0.0	22.4	0.0	31.6	0.0	33.7			
Incr Delay (d2), s/veh	10.0	0.2	0.0	0.0	1.6	0.0	0.4	0.0	7.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	15.4	6.0	0.0	0.0	7.4	0.0	0.6	0.0	2.7			
LnGrp Delay(d),s/veh	31.1	3.1	0.0	0.0	24.0	0.0	32.1	0.0	41.1			
LnGrp LOS	C	A			C		C		D			
Approach Vol, veh/h		2256			784			147				
Approach Delay, s/veh		11.5			24.0			39.4				
Approach LOS		B			C			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		11.6		65.1			36.1	29.0
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		17.0		75.0			45.0	26.0
Max Q Clear Time (g_c+I1), s		7.6		14.8			29.9	16.9
Green Ext Time (p_c), s		0.3		36.0			2.2	8.1

Intersection Summary			
HCM 2010 Ctrl Delay			15.8
HCM 2010 LOS			B

HCM 2010 Signalized Intersection Summary
7: SR 4 EB On-ramps/SR 4 EB Off-Ramps & Lone Tree Way

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1336	469	242	1648	0	0	0	0	751	12	473
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1845	1845	1845	0				1845	1845	1845
Adj Flow Rate, veh/h	0	1452	510	263	1791	0				825	0	514
Adj No. of Lanes	0	2	2	2	3	0				2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1560	1229	276	2854	0				1238	0	552
Arrive On Green	0.00	0.45	0.45	0.08	0.57	0.00				0.35	0.00	0.35
Sat Flow, veh/h	0	3597	2760	3408	5202	0				3514	0	1568
Grp Volume(v), veh/h	0	1452	510	263	1791	0				825	0	514
Grp Sat Flow(s),veh/h/ln	0	1752	1380	1704	1679	0				1757	0	1568
Q Serve(g_s), s	0.0	38.7	12.4	7.6	23.6	0.0				19.6	0.0	31.2
Cycle Q Clear(g_c), s	0.0	38.7	12.4	7.6	23.6	0.0				19.6	0.0	31.2
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1560	1229	276	2854	0				1238	0	552
V/C Ratio(X)	0.00	0.93	0.42	0.95	0.63	0.00				0.67	0.00	0.93
Avail Cap(c_a), veh/h	0	1562	1230	276	2856	0				1281	0	572
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	25.9	18.6	45.2	14.4	0.0				27.1	0.0	30.8
Incr Delay (d2), s/veh	0.0	10.3	0.2	41.3	0.4	0.0				1.3	0.0	21.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	20.8	4.7	5.1	10.9	0.0				9.7	0.0	16.8
LnGrp Delay(d),s/veh	0.0	36.3	18.9	86.4	14.8	0.0				28.3	0.0	52.5
LnGrp LOS		D	B	F	B					C		D
Approach Vol, veh/h		1962			2054						1339	
Approach Delay, s/veh		31.7			24.0						37.6	
Approach LOS		C			C						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			12.0	48.0		38.8		60.0
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			8.0	44.0		36.0		56.0
Max Q Clear Time (g_c+I1), s			9.6	40.7		33.2		25.6
Green Ext Time (p_c), s			0.0	3.2		1.6		28.5

Intersection Summary			
HCM 2010 Ctrl Delay			30.2
HCM 2010 LOS			C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (veh/h)	0	1472	607	8	42	1531	352	355	27	322	0	0
Number	7	4	14		3	8	18	5	2	12		
Initial Q (Qb), veh	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		
Parking Bus, Adj	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	0	1845	1845		1845	1845	1845	1845	1845	1845		
Adj Flow Rate, veh/h	0	1600	443		46	1664	383	407	0	323		
Adj No. of Lanes	0	3	1		1	3	1	2	0	1		
Peak Hour Factor	0.92	0.92	0.92		0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	0	3	3		3	3	3	3	3	3		
Cap, veh/h	0	2958	921		59	3382	1053	797	0	356		
Arrive On Green	0.00	0.59	0.59		0.03	0.67	0.67	0.23	0.00	0.23		
Sat Flow, veh/h	0	5202	1568		1757	5036	1568	3514	0	1568		
Grp Volume(v), veh/h	0	1600	443		46	1664	383	407	0	323		
Grp Sat Flow(s),veh/h/ln	0	1679	1568		1757	1679	1568	1757	0	1568		
Q Serve(g_s), s	0.0	15.1	12.8		2.0	12.8	8.4	8.0	0.0	15.8		
Cycle Q Clear(g_c), s	0.0	15.1	12.8		2.0	12.8	8.4	8.0	0.0	15.8		
Prop In Lane	0.00		1.00		1.00		1.00	1.00		1.00		
Lane Grp Cap(c), veh/h	0	2958	921		59	3382	1053	797	0	356		
V/C Ratio(X)	0.00	0.54	0.48		0.79	0.49	0.36	0.51	0.00	0.91		
Avail Cap(c_a), veh/h	0	2958	921		825	4731	1473	803	0	358		
HCM Platoon Ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	0.00	1.00	1.00		1.00	1.00	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	0.0	9.8	9.3		37.8	6.3	5.6	26.6	0.0	29.6		
Incr Delay (d2), s/veh	0.0	0.2	0.4		20.1	0.1	0.2	0.5	0.0	25.9		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	0.0	7.0	5.6		1.3	5.9	3.6	3.9	0.0	9.4		
LnGrp Delay(d),s/veh	0.0	10.0	9.7		57.9	6.5	5.8	27.2	0.0	55.6		
LnGrp LOS		B	A		E	A	A	C		E		
Approach Vol, veh/h		2043				2093			730			
Approach Delay, s/veh		10.0				7.5			39.7			
Approach LOS		A				A			D			

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		21.9	6.6	50.3				56.9
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		18.0	37.0	33.0				74.0
Max Q Clear Time (g_c+I1), s		17.8	4.0	17.1				14.8
Green Ext Time (p_c), s		0.1	0.1	15.2				38.1

Intersection Summary	
HCM 2010 Ctrl Delay	13.4
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	SBR
Lane Configurations	
Volume (veh/h)	0
Number	
Initial Q (Qb), veh	
Ped-Bike Adj(A_pbT)	
Parking Bus, Adj	
Adj Sat Flow, veh/h/ln	
Adj Flow Rate, veh/h	
Adj No. of Lanes	
Peak Hour Factor	
Percent Heavy Veh, %	
Cap, veh/h	
Arrive On Green	
Sat Flow, veh/h	
Grp Volume(v), veh/h	
Grp Sat Flow(s),veh/h/ln	
Q Serve(g_s), s	
Cycle Q Clear(g_c), s	
Prop In Lane	
Lane Grp Cap(c), veh/h	
V/C Ratio(X)	
Avail Cap(c_a), veh/h	
HCM Platoon Ratio	
Upstream Filter(I)	
Uniform Delay (d), s/veh	
Incr Delay (d2), s/veh	
Initial Q Delay(d3),s/veh	
%ile BackOfQ(50%),veh/ln	
LnGrp Delay(d),s/veh	
LnGrp LOS	
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	

Timer

User approved ignoring U-Turning movement.

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Volume (veh/h)	43	120	1074	77	207	1504	144	15	164	92	128	25
Number		7	4	14	3	8	18		5	2	12	
Initial Q (Qb), veh		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	
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Adj Sat Flow, veh/h/ln		1845	1845	1845	1845	1845	1845		1845	1845	1845	
Adj Flow Rate, veh/h		130	1167	48	225	1635	117		178	100	114	
Adj No. of Lanes		1	3	1	1	3	1		2	1	1	
Peak Hour Factor		0.92	0.92	0.92	0.92	0.92	0.92		0.92	0.92	0.92	
Percent Heavy Veh, %		3	3	3	3	3	3		3	3	3	
Cap, veh/h		172	2006	625	279	2314	720		268	293	249	
Arrive On Green		0.10	0.40	0.40	0.16	0.46	0.46		0.08	0.16	0.16	
Sat Flow, veh/h		1757	5036	1568	1757	5036	1568		3408	1845	1568	
Grp Volume(v), veh/h		130	1167	48	225	1635	117		178	100	114	
Grp Sat Flow(s),veh/h/ln		1757	1679	1568	1757	1679	1568		1704	1845	1568	
Q Serve(g_s), s		4.6	11.5	1.2	7.8	16.5	2.8		3.2	3.1	4.2	
Cycle Q Clear(g_c), s		4.6	11.5	1.2	7.8	16.5	2.8		3.2	3.1	4.2	
Prop In Lane		1.00		1.00	1.00		1.00		1.00		1.00	
Lane Grp Cap(c), veh/h		172	2006	625	279	2314	720		268	293	249	
V/C Ratio(X)		0.76	0.58	0.08	0.81	0.71	0.16		0.66	0.34	0.46	
Avail Cap(c_a), veh/h		1106	3251	1012	581	2314	720		268	523	444	
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Upstream Filter(I)		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Uniform Delay (d), s/veh		27.9	15.0	11.9	25.8	13.7	10.0		28.4	23.8	24.2	
Incr Delay (d2), s/veh		6.6	0.3	0.1	5.4	1.0	0.1		6.0	0.7	1.3	
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln		2.5	5.3	0.5	4.2	7.8	1.2		1.7	1.6	1.9	
LnGrp Delay(d),s/veh		34.5	15.2	11.9	31.2	14.7	10.1		34.5	24.4	25.5	
LnGrp LOS		C	B	B	C	B	B		C	C	C	
Approach Vol, veh/h			1345			1977				392		
Approach Delay, s/veh			17.0			16.3				29.3		
Approach LOS			B			B				C		

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.0	14.1	14.1	29.3	9.0	11.1	10.2	33.2
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.0	18.0	21.0	41.0	5.0	17.0	40.0	22.0
Max Q Clear Time (g_c+I1), s	2.7	6.2	9.8	13.5	5.2	5.6	6.6	18.5
Green Ext Time (p_c), s	0.0	1.5	0.4	11.8	0.0	1.5	0.3	3.3

Intersection Summary	
HCM 2010 Ctrl Delay	18.6
HCM 2010 LOS	B

Notes

User approved ignoring U-Turning movement.

Movement	SBL	SBT	SBR
Lane Configurations			
Volume (veh/h)	37	81	87
Number	1	6	16
Initial Q (Qb), veh	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900
Adj Flow Rate, veh/h	40	88	95
Adj No. of Lanes	2	2	0
Peak Hour Factor	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3
Cap, veh/h	109	196	176
Arrive On Green	0.03	0.11	0.11
Sat Flow, veh/h	3408	1752	1568
Grp Volume(v), veh/h	40	88	95
Grp Sat Flow(s),veh/h/ln	1704	1752	1568
Q Serve(g_s), s	0.7	3.0	3.6
Cycle Q Clear(g_c), s	0.7	3.0	3.6
Prop In Lane	1.00		1.00
Lane Grp Cap(c), veh/h	109	196	176
V/C Ratio(X)	0.37	0.45	0.54
Avail Cap(c_a), veh/h	215	469	420
HCM Platoon Ratio	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.1	26.4	26.7
Incr Delay (d2), s/veh	2.1	1.6	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	1.5	1.7
LnGrp Delay(d),s/veh	32.2	28.0	29.2
LnGrp LOS	C	C	C
Approach Vol, veh/h		223	
Approach Delay, s/veh		29.3	
Approach LOS		C	

Timer

HCM 2010 Signalized Intersection Summary
10: Country Hills Road & Laurel Road
10/27/2015

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	905	420	127	843	160	330
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1900	1845	1845	1845	1845
Adj Flow Rate, veh/h	984	457	138	916	174	359
Adj No. of Lanes	2	0	2	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	1269	579	209	2279	452	403
Arrive On Green	0.54	0.54	0.06	0.65	0.26	0.26
Sat Flow, veh/h	2433	1068	3408	3597	1757	1568
Grp Volume(v), veh/h	732	709	138	916	174	359
Grp Sat Flow(s),veh/h/ln	1752	1656	1704	1752	1757	1568
Q Serve(g_s), s	28.3	29.5	3.4	10.7	7.0	19.0
Cycle Q Clear(g_c), s	28.3	29.5	3.4	10.7	7.0	19.0
Prop In Lane		0.64	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	950	898	209	2279	452	403
V/C Ratio(X)	0.77	0.79	0.66	0.40	0.39	0.89
Avail Cap(c_a), veh/h	1057	999	316	2602	571	509
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.5	15.8	39.6	7.1	26.4	30.9
Incr Delay (d2), s/veh	3.2	3.9	3.5	0.1	0.5	15.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.5	14.4	1.7	5.1	3.5	9.9
LnGrp Delay(d),s/veh	18.7	19.7	43.1	7.3	26.9	45.9
LnGrp LOS	B	B	D	A	C	D
Approach Vol, veh/h	1441			1054	533	
Approach Delay, s/veh	19.2			11.9	39.7	
Approach LOS	B			B	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		26.2	9.3	50.8				60.1
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		28.0	8.0	52.0				64.0
Max Q Clear Time (g_c+I1), s		21.0	5.4	31.5				12.7
Green Ext Time (p_c), s		1.1	0.1	15.2				27.7

Intersection Summary		
HCM 2010 Ctrl Delay		20.3
HCM 2010 LOS		C

HCM 2010 Signalized Intersection Summary
11: Slatten Ranch Road & Laurel Road
10/27/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	183	1066	632	263	783	355	417	208	120	123	180	49
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1845	1845	1845	1845	1845	1900	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	199	1159	344	286	851	386	453	226	130	134	196	53
Adj No. of Lanes	1	3	1	1	3	0	2	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	237	1716	534	327	1330	601	543	408	226	169	341	90
Arrive On Green	0.14	0.34	0.34	0.19	0.39	0.39	0.16	0.19	0.19	0.10	0.12	0.12
Sat Flow, veh/h	1757	5036	1568	1757	3396	1535	3408	2178	1206	1757	2745	724
Grp Volume(v), veh/h	199	1159	344	286	841	396	453	180	176	134	123	126
Grp Sat Flow(s),veh/h/ln	1757	1679	1568	1757	1679	1574	1704	1752	1632	1757	1752	1717
Q Serve(g_s), s	9.3	16.6	15.6	13.3	17.2	17.2	10.9	7.9	8.3	6.3	5.6	5.8
Cycle Q Clear(g_c), s	9.3	16.6	15.6	13.3	17.2	17.2	10.9	7.9	8.3	6.3	5.6	5.8
Prop In Lane	1.00		1.00	1.00		0.98	1.00		0.74	1.00		0.42
Lane Grp Cap(c), veh/h	237	1716	534	327	1315	617	543	328	306	169	218	213
V/C Ratio(X)	0.84	0.68	0.64	0.87	0.64	0.64	0.83	0.55	0.57	0.79	0.57	0.59
Avail Cap(c_a), veh/h	312	1791	558	417	1393	653	647	395	368	312	374	366
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.6	23.8	23.5	33.4	20.8	20.8	34.4	31.0	31.2	37.3	34.8	34.9
Incr Delay (d2), s/veh	14.2	1.0	2.4	15.3	0.9	2.0	8.0	1.4	1.7	8.2	2.3	2.6
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(50%),veh/ln	5.5	7.9	7.1	7.8	8.1	7.8	5.7	3.9	3.9	3.4	2.8	2.9
LnGrp Delay(d),s/veh	49.8	24.8	25.9	48.7	21.7	22.8	42.4	32.5	32.9	45.5	37.1	37.5
LnGrp LOS	D	C	C	D	C	C	D	C	C	D	D	D
Approach Vol, veh/h		1702			1523			809			383	
Approach Delay, s/veh		27.9			27.1			38.1			40.2	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.1	19.8	19.7	32.7	17.4	14.5	15.4	37.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	15.0	19.0	20.0	30.0	16.0	18.0	15.0	35.0
Max Q Clear Time (g_c+I1), s	8.3	10.3	15.3	18.6	12.9	7.8	11.3	19.2
Green Ext Time (p_c), s	0.2	2.4	0.4	10.1	0.6	2.6	0.2	13.6

Intersection Summary		
HCM 2010 Ctrl Delay		30.6
HCM 2010 LOS		C

HCM 2010 Signalized Intersection Summary
2: Hillcrest Ave & SR 4 EB Ramps

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	312	0	1197	0	0	0	0	553	571	328	967	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1845				0	1845	1900	1845	1845	0
Adj Flow Rate, veh/h	328	0	1260				0	582	601	345	1018	0
Adj No. of Lanes	2	0	2				0	3	0	2	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	1601	0	1429				0	966	451	422	1597	0
Arrive On Green	0.46	0.00	0.46				0.00	0.29	0.29	0.12	0.46	0.00
Sat Flow, veh/h	3514	0	3136				0	3523	1568	3408	3597	0
Grp Volume(v), veh/h	328	0	1260				0	582	601	345	1018	0
Grp Sat Flow(s),veh/h/ln	1757	0	1568				0	1679	1568	1704	1752	0
Q Serve(g_s), s	5.1	0.0	33.0				0.0	13.5	26.0	8.9	20.1	0.0
Cycle Q Clear(g_c), s	5.1	0.0	33.0				0.0	13.5	26.0	8.9	20.1	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1601	0	1429				0	966	451	422	1597	0
V/C Ratio(X)	0.20	0.00	0.88				0.00	0.60	1.33	0.82	0.64	0.00
Avail Cap(c_a), veh/h	1905	0	1700				0	966	451	490	1668	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	14.8	0.0	22.4				0.0	27.7	32.2	38.6	18.9	0.0
Incr Delay (d2), s/veh	0.1	0.0	5.1				0.0	1.1	164.1	9.2	0.8	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
%ile BackOfQ(50%),veh/ln	2.5	0.0	15.2				0.0	6.4	31.7	4.8	9.8	0.0
LnGrp Delay(d),s/veh	14.8	0.0	27.5				0.0	28.8	196.3	47.8	19.6	0.0
LnGrp LOS	B		C					C	F	D	B	
Approach Vol, veh/h		1588						1183			1363	
Approach Delay, s/veh		24.9						113.9			26.8	
Approach LOS		C						F			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	15.2	30.0		45.2		45.2		
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		
Max Green Setting (Gmax), s	13.0	26.0		49.0		43.0		
Max Q Clear Time (g_c+I1), s	10.9	28.0		35.0		22.1		
Green Ext Time (p_c), s	0.3	0.0		6.1		15.3		

Intersection Summary		
HCM 2010 Ctrl Delay		51.0
HCM 2010 LOS		D

Notes

User approved volume balancing among the lanes for turning movement.

HCM 2010 Signalized Intersection Summary
3: Hillcrest Ave & Laurel Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	208	115	157	487	307	285	120	1405	400	327	1111	288
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1845	1845	1900	1845	1845	1845	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	219	121	165	513	323	153	126	1479	0	344	1169	303
Adj No. of Lanes	1	1	0	1	1	1	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	297	269	367	344	701	596	123	1332	0	211	1188	305
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.07	0.38	0.00	0.12	0.43	0.43
Sat Flow, veh/h	906	708	966	1078	1845	1568	1757	3597	0	1757	2764	708
Grp Volume(v), veh/h	219	0	286	513	323	153	126	1479	0	344	736	736
Grp Sat Flow(s),veh/h/ln	906	0	1674	1078	1845	1568	1757	1752	0	1757	1752	1720
Q Serve(g_s), s	24.0	0.0	12.8	25.2	13.2	6.7	7.0	38.0	0.0	12.0	41.3	42.6
Cycle Q Clear(g_c), s	37.1	0.0	12.8	38.0	13.2	6.7	7.0	38.0	0.0	12.0	41.3	42.6
Prop In Lane	1.00		0.58	1.00		1.00	1.00		0.00	1.00		0.41
Lane Grp Cap(c), veh/h	297	0	636	344	701	596	123	1332	0	211	754	739
V/C Ratio(X)	0.74	0.00	0.45	1.49	0.46	0.26	1.02	1.11	0.00	1.63	0.98	0.99
Avail Cap(c_a), veh/h	297	0	636	344	701	596	123	1332	0	211	754	739
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.3	0.0	23.2	40.0	23.3	21.3	46.5	31.0	0.0	44.0	28.0	28.4
Incr Delay (d2), s/veh	9.3	0.0	0.5	236.0	0.5	0.2	87.9	60.8	0.0	304.8	27.1	31.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.7	0.0	6.0	32.0	6.7	2.9	6.4	29.6	0.0	23.6	25.5	26.5
LnGrp Delay(d),s/veh	46.5	0.0	23.7	276.0	23.8	21.5	134.7	91.8	0.0	348.8	55.1	60.1
LnGrp LOS	D		C	F	C	C	F	F		F	E	E
Approach Vol, veh/h		505			989			1605			1816	
Approach Delay, s/veh		33.6			154.3			95.2			112.8	
Approach LOS		C			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	16.0	42.0		42.0	11.0	47.0		42.0
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	12.0	38.0		38.0	7.0	43.0		38.0
Max Q Clear Time (g_c+I1), s	14.0	40.0		39.1	9.0	44.6		40.0
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		107.3
HCM 2010 LOS		F

HCM 2010 Signalized Intersection Summary
4: Canada Valley Road & Laurel Road

10/27/2015

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	683	216	687	946	66	395
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1900	1845	1845	1845	1845
Adj Flow Rate, veh/h	742	235	747	1028	72	215
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	746	236	768	2672	274	245
Arrive On Green	0.28	0.28	0.44	0.76	0.16	0.16
Sat Flow, veh/h	2713	830	1757	3597	1757	1568
Grp Volume(v), veh/h	496	481	747	1028	72	215
Grp Sat Flow(s),veh/h/ln	1752	1698	1757	1752	1757	1568
Q Serve(g_s), s	27.8	27.8	41.0	9.7	3.5	13.2
Cycle Q Clear(g_c), s	27.8	27.8	41.0	9.7	3.5	13.2
Prop In Lane		0.49	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	499	484	768	2672	274	245
V/C Ratio(X)	0.99	0.99	0.97	0.38	0.26	0.88
Avail Cap(c_a), veh/h	499	484	768	2673	304	271
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.1	35.1	27.1	3.9	36.5	40.6
Incr Delay (d2), s/veh	38.7	39.4	25.8	0.1	0.5	24.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.7	18.2	25.2	4.6	1.8	7.4
LnGrp Delay(d),s/veh	73.8	74.4	53.0	4.0	37.0	65.2
LnGrp LOS	E	E	D	A	D	E
Approach Vol, veh/h	977			1775	287	
Approach Delay, s/veh	74.1			24.6	58.1	
Approach LOS	E			C	E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		19.4	47.0	32.0				79.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		17.0	43.0	28.0				75.0
Max Q Clear Time (g_c+I1), s		15.2	43.0	29.8				11.7
Green Ext Time (p_c), s		0.2	0.0	0.0				25.2

Intersection Summary	
HCM 2010 Ctrl Delay	43.7
HCM 2010 LOS	D

HCM 2010 Signalized Intersection Summary
5: SR 4 EB On-Ramps/SR 4 EB Off-Ramps & Laurel Road

10/27/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1277	40	0	1127	20	0	0	0	712	0	566
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1900	0	1845	1900				1845	1845	1845
Adj Flow Rate, veh/h	0	1388	43	0	1225	0				774	0	615
Adj No. of Lanes	0	2	0	0	2	0				2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	0	3	3				3	3	3
Cap, veh/h	0	1657	51	0	1674	0				1530	0	683
Arrive On Green	0.00	0.48	0.48	0.00	0.48	0.00				0.44	0.00	0.44
Sat Flow, veh/h	0	3563	107	0	3689	0				3514	0	1568
Grp Volume(v), veh/h	0	700	731	0	1225	0				774	0	615
Grp Sat Flow(s),veh/h/ln	0	1752	1826	0	1752	0				1757	0	1568
Q Serve(g_s), s	0.0	32.0	32.1	0.0	25.8	0.0				14.7	0.0	33.5
Cycle Q Clear(g_c), s	0.0	32.0	32.1	0.0	25.8	0.0				14.7	0.0	33.5
Prop In Lane	0.00		0.06	0.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	837	872	0	1674	0				1530	0	683
V/C Ratio(X)	0.00	0.84	0.84	0.00	0.73	0.00				0.51	0.00	0.90
Avail Cap(c_a), veh/h	0	857	892	0	1713	0				1794	0	801
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	20.9	21.0	0.0	19.3	0.0				18.8	0.0	24.1
Incr Delay (d2), s/veh	0.0	7.2	7.0	0.0	1.6	0.0				0.3	0.0	12.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	17.0	17.7	0.0	12.8	0.0				7.2	0.0	16.6
LnGrp Delay(d),s/veh	0.0	28.1	28.0	0.0	20.9	0.0				19.1	0.0	36.1
LnGrp LOS		C	C		C					B		D
Approach Vol, veh/h		1431			1225						1389	
Approach Delay, s/veh		28.0			20.9						26.6	
Approach LOS		C			C						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				48.0		44.1		48.0
Change Period (Y+Rc), s				4.0		4.0		4.0
Max Green Setting (Gmax), s				45.0		47.0		45.0
Max Q Clear Time (g_c+I1), s				34.1		35.5		27.8
Green Ext Time (p_c), s				9.8		4.6		14.9

Intersection Summary	
HCM 2010 Ctrl Delay	25.4
HCM 2010 LOS	C

Notes
User approved volume balancing among the lanes for turning movement.

6: SR 4 WB Off-Ramps/SR 4 WB On-Ramps & Laurel Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	229	1460	0	0	1043	736	168	0	339	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	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			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1845	1845	0	0	1845	1845	1900	1845	1845			
Adj Flow Rate, veh/h	249	1587	0	0	1134	0	183	0	368			
Adj No. of Lanes	1	2	0	0	2	1	0	1	1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	290	2231	0	0	1489	666	474	0	423			
Arrive On Green	0.16	0.64	0.00	0.00	0.42	0.00	0.27	0.00	0.27			
Sat Flow, veh/h	1757	3597	0	0	3597	1568	1757	0	1568			
Grp Volume(v), veh/h	249	1587	0	0	1134	0	183	0	368			
Grp Sat Flow(s),veh/h/ln	1757	1752	0	0	1752	1568	1757	0	1568			
Q Serve(g_s), s	11.8	25.6	0.0	0.0	23.4	0.0	7.2	0.0	19.1			
Cycle Q Clear(g_c), s	11.8	25.6	0.0	0.0	23.4	0.0	7.2	0.0	19.1			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	290	2231	0	0	1489	666	474	0	423			
V/C Ratio(X)	0.86	0.71	0.00	0.00	0.76	0.00	0.39	0.00	0.87			
Avail Cap(c_a), veh/h	392	2468	0	0	1522	681	660	0	589			
HCM Platoon Ratio	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	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	34.6	10.3	0.0	0.0	20.8	0.0	25.4	0.0	29.7			
Incr Delay (d2), s/veh	13.5	0.9	0.0	0.0	2.3	0.0	0.5	0.0	10.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	6.8	12.4	0.0	0.0	11.8	0.0	3.6	0.0	9.5			
LnGrp Delay(d),s/veh	48.1	11.2	0.0	0.0	23.1	0.0	25.9	0.0	39.8			
LnGrp LOS	D	B			C		C		D			
Approach Vol, veh/h		1836			1134			551				
Approach Delay, s/veh		16.2			23.1			35.2				
Approach LOS		B			C			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		27.0		58.2			18.0	40.2				
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0				
Max Green Setting (Gmax), s		32.0		60.0			19.0	37.0				
Max Q Clear Time (g_c+I1), s		21.1		27.6			13.8	25.4				
Green Ext Time (p_c), s		1.9		26.6			0.3	10.6				
Intersection Summary												
HCM 2010 Ctrl Delay			21.4									
HCM 2010 LOS			C									

7: SR 4 EB On-ramps/SR 4 EB Off-Ramps & Lone Tree Way

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1563	851	282	1689	0	0	0	0	921	10	601
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1845	1845	1845	0				1845	1845	1845
Adj Flow Rate, veh/h	0	1645	896	297	1778	0				977	0	633
Adj No. of Lanes	0	2	2	2	3	0				2	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1507	1187	307	2820	0				1265	0	564
Arrive On Green	0.00	0.43	0.43	0.09	0.56	0.00				0.36	0.00	0.36
Sat Flow, veh/h	0	3597	2760	3408	5202	0				3514	0	1568
Grp Volume(v), veh/h	0	1645	896	297	1778	0				977	0	633
Grp Sat Flow(s),veh/h/ln	0	1752	1380	1704	1679	0				1757	0	1568
Q Serve(g_s), s	0.0	43.0	27.4	8.7	24.0	0.0				24.6	0.0	36.0
Cycle Q Clear(g_c), s	0.0	43.0	27.4	8.7	24.0	0.0				24.6	0.0	36.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1507	1187	307	2820	0				1265	0	564
V/C Ratio(X)	0.00	1.09	0.76	0.97	0.63	0.00				0.77	0.00	1.12
Avail Cap(c_a), veh/h	0	1507	1187	307	2820	0				1265	0	564
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	28.5	24.1	45.4	15.0	0.0				28.4	0.0	32.0
Incr Delay (d2), s/veh	0.0	52.4	2.8	42.7	0.5	0.0				3.0	0.0	75.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	31.7	10.8	5.9	11.1	0.0				12.5	0.0	27.4
LnGrp Delay(d),s/veh	0.0	80.9	26.9	88.0	15.4	0.0				31.4	0.0	107.9
LnGrp LOS		F	C	F	B					C		F
Approach Vol, veh/h		2541			2075						1610	
Approach Delay, s/veh		61.8			25.8						61.4	
Approach LOS		E			C						E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			13.0	47.0		40.0		60.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			9.0	43.0		36.0		56.0				
Max Q Clear Time (g_c+I1), s			10.7	45.0		38.0		26.0				
Green Ext Time (p_c), s			0.0	0.0		0.0		29.0				
Intersection Summary												
HCM 2010 Ctrl Delay			49.7									
HCM 2010 LOS			D									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (veh/h)	0	1990	566	20	38	1411	580	609	32	481	0	0
Number	7	4	14		3	8	18	5	2	12		
Initial Q (Qb), veh	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		
Parking Bus, Adj	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	0	1845	1845		1845	1845	1845	1845	1845	1845		
Adj Flow Rate, veh/h	0	2095	385		40	1485	611	665	0	480		
Adj No. of Lanes	0	3	1		1	3	1	2	0	1		
Peak Hour Factor	0.95	0.95	0.95		0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	0	3	3		3	3	3	3	3	3		
Cap, veh/h	0	2526	786		50	2884	898	1203	0	537		
Arrive On Green	0.00	0.50	0.50		0.03	0.57	0.57	0.34	0.00	0.34		
Sat Flow, veh/h	0	5202	1568		1757	5036	1568	3514	0	1568		
Grp Volume(v), veh/h	0	2095	385		40	1485	611	665	0	480		
Grp Sat Flow(s),veh/h/ln	0	1679	1568		1757	1679	1568	1757	0	1568		
Q Serve(g_s), s	0.0	33.4	15.2		2.1	16.8	25.6	14.4	0.0	27.3		
Cycle Q Clear(g_c), s	0.0	33.4	15.2		2.1	16.8	25.6	14.4	0.0	27.3		
Prop In Lane	0.00		1.00		1.00		1.00	1.00		1.00		
Lane Grp Cap(c), veh/h	0	2526	786		50	2884	898	1203	0	537		
V/C Ratio(X)	0.00	0.83	0.49		0.80	0.51	0.68	0.55	0.00	0.89		
Avail Cap(c_a), veh/h	0	2526	786		75	2947	918	1383	0	617		
HCM Platoon Ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	0.00	1.00	1.00		1.00	1.00	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	0.0	20.0	15.5		45.4	12.2	14.1	25.1	0.0	29.3		
Incr Delay (d2), s/veh	0.0	2.5	0.5		29.4	0.1	2.0	0.4	0.0	14.2		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	0.0	15.9	6.6		1.4	7.7	11.5	7.1	0.0	13.8		
LnGrp Delay(d),s/veh	0.0	22.4	15.9		74.8	12.3	16.1	25.5	0.0	43.5		
LnGrp LOS		C	B		E	B	B	C		D		
Approach Vol, veh/h		2480				2136			1145			
Approach Delay, s/veh		21.4				14.6			33.0			
Approach LOS		C				B			C			

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		36.2	6.7	51.1				57.8
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		37.0	4.0	47.0				55.0
Max Q Clear Time (g_c+I1), s		29.3	4.1	35.4				27.6
Green Ext Time (p_c), s		2.9	0.0	11.4				26.2

Intersection Summary	
HCM 2010 Ctrl Delay	21.2
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	SBR
Lane Configurations	
Volume (veh/h)	0
Number	
Initial Q (Qb), veh	
Ped-Bike Adj(A_pbT)	
Parking Bus, Adj	
Adj Sat Flow, veh/h/ln	
Adj Flow Rate, veh/h	
Adj No. of Lanes	
Peak Hour Factor	
Percent Heavy Veh, %	
Cap, veh/h	
Arrive On Green	
Sat Flow, veh/h	
Grp Volume(v), veh/h	
Grp Sat Flow(s),veh/h/ln	
Q Serve(g_s), s	
Cycle Q Clear(g_c), s	
Prop In Lane	
Lane Grp Cap(c), veh/h	
V/C Ratio(X)	
Avail Cap(c_a), veh/h	
HCM Platoon Ratio	
Upstream Filter(I)	
Uniform Delay (d), s/veh	
Incr Delay (d2), s/veh	
Initial Q Delay(d3),s/veh	
%ile BackOfQ(50%),veh/ln	
LnGrp Delay(d),s/veh	
LnGrp LOS	
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	

Timer

User approved ignoring U-Turning movement.

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Volume (veh/h)	101	273	1712	131	226	1389	180	16	195	97	178	59
Number		7	4	14	3	8	18		5	2	12	
Initial Q (Qb), veh		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	
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Adj Sat Flow, veh/h/ln		1845	1845	1845	1845	1845	1845		1845	1845	1845	
Adj Flow Rate, veh/h		297	1861	120	246	1510	148		212	105	168	
Adj No. of Lanes		1	3	1	1	3	1		2	1	1	
Peak Hour Factor		0.92	0.92	0.92	0.92	0.92	0.92		0.92	0.92	0.92	
Percent Heavy Veh, %		3	3	3	3	3	3		3	3	3	
Cap, veh/h		336	2335	727	284	2186	681		285	295	251	
Arrive On Green		0.19	0.46	0.46	0.16	0.43	0.43		0.08	0.16	0.16	
Sat Flow, veh/h		1757	5036	1568	1757	5036	1568		3408	1845	1568	
Grp Volume(v), veh/h		297	1861	120	246	1510	148		212	105	168	
Grp Sat Flow(s),veh/h/ln		1757	1679	1568	1757	1679	1568		1704	1845	1568	
Q Serve(g_s), s		14.4	27.4	3.9	11.9	21.2	5.2		5.3	4.4	8.8	
Cycle Q Clear(g_c), s		14.4	27.4	3.9	11.9	21.2	5.2		5.3	4.4	8.8	
Prop In Lane		1.00		1.00	1.00		1.00		1.00		1.00	
Lane Grp Cap(c), veh/h		336	2335	727	284	2186	681		285	295	251	
V/C Ratio(X)		0.88	0.80	0.17	0.86	0.69	0.22		0.74	0.36	0.67	
Avail Cap(c_a), veh/h		422	2364	736	362	2191	682		312	444	377	
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Upstream Filter(I)		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Uniform Delay (d), s/veh		34.3	19.9	13.6	35.7	20.0	15.4		39.1	32.7	34.5	
Incr Delay (d2), s/veh		16.4	2.0	0.1	16.0	0.9	0.2		8.4	0.7	3.1	
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln		8.5	13.0	1.7	7.0	10.0	2.3		2.8	2.3	4.0	
LnGrp Delay(d),s/veh		50.8	21.9	13.7	51.6	20.9	15.6		47.5	33.4	37.6	
LnGrp LOS		D	C	B	D	C	B		D	C	D	
Approach Vol, veh/h			2278			1904				485		
Approach Delay, s/veh			25.2			24.5				41.0		
Approach LOS			C			C				D		

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.7	18.0	18.1	44.5	11.3	13.4	20.7	41.9
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.0	21.0	18.0	41.0	8.0	17.0	21.0	38.0
Max Q Clear Time (g_c+I1), s	3.2	10.8	13.9	29.4	7.3	7.7	16.4	23.2
Green Ext Time (p_c), s	0.0	1.8	0.3	11.0	0.0	1.7	0.4	14.1

Intersection Summary		
HCM 2010 Ctrl Delay		27.4
HCM 2010 LOS		C

Notes

User approved ignoring U-Turning movement.

Movement	SBL	SBT	SBR
Lane Configurations			
Volume (veh/h)	43	149	60
Number	1	6	16
Initial Q (Qb), veh	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900
Adj Flow Rate, veh/h	47	162	65
Adj No. of Lanes	2	2	0
Peak Hour Factor	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3
Cap, veh/h	106	266	103
Arrive On Green	0.03	0.11	0.11
Sat Flow, veh/h	3408	2474	955
Grp Volume(v), veh/h	47	113	114
Grp Sat Flow(s),veh/h/ln	1704	1752	1676
Q Serve(g_s), s	1.2	5.4	5.7
Cycle Q Clear(g_c), s	1.2	5.4	5.7
Prop In Lane	1.00		0.57
Lane Grp Cap(c), veh/h	106	188	180
V/C Ratio(X)	0.44	0.60	0.63
Avail Cap(c_a), veh/h	156	341	326
HCM Platoon Ratio	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.6	37.2	37.3
Incr Delay (d2), s/veh	2.9	3.0	3.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	2.8	2.8
LnGrp Delay(d),s/veh	44.4	40.2	41.0
LnGrp LOS	D	D	D
Approach Vol, veh/h		274	
Approach Delay, s/veh		41.3	
Approach LOS		D	

Timer

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	960	120	402	1371	90	170
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1900	1845	1845	1845	1845
Adj Flow Rate, veh/h	1043	130	437	1490	98	185
Adj No. of Lanes	2	0	2	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	1677	209	556	2627	258	230
Arrive On Green	0.53	0.53	0.16	0.75	0.15	0.15
Sat Flow, veh/h	3230	391	3408	3597	1757	1568
Grp Volume(v), veh/h	582	591	437	1490	98	185
Grp Sat Flow(s),veh/h/ln	1752	1776	1704	1752	1757	1568
Q Serve(g_s), s	17.9	17.9	9.5	14.3	3.9	8.8
Cycle Q Clear(g_c), s	17.9	17.9	9.5	14.3	3.9	8.8
Prop In Lane		0.22	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	937	949	556	2627	258	230
V/C Ratio(X)	0.62	0.62	0.79	0.57	0.38	0.80
Avail Cap(c_a), veh/h	1089	1103	926	3311	432	386
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.5	12.5	31.0	4.2	29.8	31.9
Incr Delay (d2), s/veh	0.8	0.8	2.5	0.2	0.9	6.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.8	8.9	4.7	6.9	1.9	4.2
LnGrp Delay(d),s/veh	13.4	13.4	33.5	4.4	30.7	38.3
LnGrp LOS	B	B	C	A	C	D
Approach Vol, veh/h	1173			1927	283	
Approach Delay, s/veh	13.4			11.0	35.7	
Approach LOS	B			B	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		15.4	16.6	45.3				61.9
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		19.0	21.0	48.0				73.0
Max Q Clear Time (g_c+I1), s		10.8	11.5	19.9				16.3
Green Ext Time (p_c), s		0.6	1.1	21.4				34.6

Intersection Summary			
HCM 2010 Ctrl Delay			13.9
HCM 2010 LOS			B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	113	1378	290	260	1048	230	612	271	301	230	410	110
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1845	1845	1845	1845	1845	1900	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	123	1498	157	283	1139	250	665	295	327	250	446	120
Adj No. of Lanes	1	3	1	1	3	0	2	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	151	1511	470	299	1587	348	682	367	328	282	465	124
Arrive On Green	0.09	0.30	0.30	0.17	0.38	0.38	0.20	0.21	0.21	0.16	0.17	0.17
Sat Flow, veh/h	1757	5036	1568	1757	4134	907	3408	1752	1568	1757	2737	731
Grp Volume(v), veh/h	123	1498	157	283	925	464	665	295	327	250	284	282
Grp Sat Flow(s),veh/h/ln	1757	1679	1568	1757	1679	1685	1704	1752	1568	1757	1752	1716
Q Serve(g_s), s	6.9	29.6	7.8	15.9	23.4	23.4	19.4	16.0	20.8	13.9	16.1	16.3
Cycle Q Clear(g_c), s	6.9	29.6	7.8	15.9	23.4	23.4	19.4	16.0	20.8	13.9	16.1	16.3
Prop In Lane	1.00		1.00	1.00		0.54	1.00		1.00	1.00		0.43
Lane Grp Cap(c), veh/h	151	1511	470	299	1289	647	682	367	328	282	298	292
V/C Ratio(X)	0.81	0.99	0.33	0.95	0.72	0.72	0.98	0.80	1.00	0.89	0.95	0.97
Avail Cap(c_a), veh/h	176	1511	470	299	1289	647	682	367	328	316	298	292
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.9	34.9	27.2	41.1	26.2	26.2	39.8	37.6	39.5	41.1	41.1	41.2
Incr Delay (d2), s/veh	21.7	21.1	0.4	38.2	1.9	3.8	28.3	12.3	48.6	22.9	39.8	43.3
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(50%),veh/ln	4.3	16.7	3.4	10.9	11.1	11.5	11.8	9.0	13.4	8.5	11.0	11.3
LnGrp Delay(d),s/veh	66.6	56.0	27.6	79.2	28.2	30.0	68.1	49.8	88.1	64.0	80.9	84.5
LnGrp LOS	E	E	C	E	C	C	E	D	F	E	F	F
Approach Vol, veh/h		1778			1672			1287			816	
Approach Delay, s/veh		54.2			37.3			69.0			77.0	
Approach LOS		D			D			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.1	24.9	21.0	34.0	24.0	21.0	12.6	42.4
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	18.0	19.0	17.0	30.0	20.0	17.0	10.0	37.0
Max Q Clear Time (g_c+I1), s	15.9	22.8	17.9	31.6	21.4	18.3	8.9	25.4
Green Ext Time (p_c), s	0.2	0.0	0.0	0.0	0.0	0.0	0.0	10.8

Intersection Summary			
HCM 2010 Ctrl Delay			55.9
HCM 2010 LOS			E

HCM 2010 Signalized Intersection Summary
1: Hillcrest Ave & SR4 WB Ramps

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	655	646	816	124
Number			5	2	6	16
Initial Q (Qb), veh			0	0	0	0
Ped-Bike Adj(A_pbT)			1.00			1.00
Parking Bus, Adj			1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln			1845	1845	1845	1900
Adj Flow Rate, veh/h			712	702	887	0
Adj No. of Lanes			2	1	2	0
Peak Hour Factor			0.92	0.92	0.92	0.92
Percent Heavy Veh, %			3	3	3	3
Cap, veh/h			988	1686	1888	0
Arrive On Green			0.29	0.91	0.54	0.00
Sat Flow, veh/h			3408	1845	3689	0
Grp Volume(v), veh/h			712	702	887	0
Grp Sat Flow(s),veh/h/ln			1704	1845	1752	0
Q Serve(g_s), s			8.7	2.5	7.3	0.0
Cycle Q Clear(g_c), s			8.7	2.5	7.3	0.0
Prop In Lane			1.00			0.00
Lane Grp Cap(c), veh/h			988	1686	1888	0
V/C Ratio(X)			0.72	0.42	0.47	0.00
Avail Cap(c_a), veh/h			2851	3798	3984	0
HCM Platoon Ratio			1.00	1.00	1.00	1.00
Upstream Filter(I)			1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh			14.9	0.3	6.6	0.0
Incr Delay (d2), s/veh			1.0	0.2	0.2	0.0
Initial Q Delay(d3),s/veh			0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln			4.2	1.1	3.5	0.0
LnGrp Delay(d),s/veh			15.9	0.4	6.8	0.0
LnGrp LOS			B	A	A	
Approach Vol, veh/h				1414	887	
Approach Delay, s/veh				8.2	6.8	
Approach LOS				A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		
Phs Duration (G+Y+Rc), s		46.6			17.5	29.1		
Change Period (Y+Rc), s		4.0			4.0	4.0		
Max Green Setting (Gmax), s		96.0			39.0	53.0		
Max Q Clear Time (g_c+I1), s		4.5			10.7	9.3		
Green Ext Time (p_c), s		17.9			2.8	15.8		

Intersection Summary	
HCM 2010 Ctrl Delay	7.7
HCM 2010 LOS	A

HCM 2010 Signalized Intersection Summary
2: Hillcrest Ave & SR 4 EB Ramps

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	142	1	687	0	0	0	0	1157	395	168	636	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1845				0	1845	1900	1845	1845	0
Adj Flow Rate, veh/h	154	1	747				0	1258	429	183	691	0
Adj No. of Lanes	0	1	2				0	3	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	511	3	807				0	1664	566	221	2166	0
Arrive On Green	0.29	0.29	0.29				0.00	0.45	0.45	0.13	0.62	0.00
Sat Flow, veh/h	1746	11	2760				0	3881	1264	1757	3597	0
Grp Volume(v), veh/h	155	0	747				0	1136	551	183	691	0
Grp Sat Flow(s),veh/h/ln	1757	0	1380				0	1679	1622	1757	1752	0
Q Serve(g_s), s	6.1	0.0	23.5				0.0	25.3	25.4	9.1	8.4	0.0
Cycle Q Clear(g_c), s	6.1	0.0	23.5				0.0	25.3	25.4	9.1	8.4	0.0
Prop In Lane	0.99		1.00				0.00		0.78	1.00		0.00
Lane Grp Cap(c), veh/h	514	0	807				0	1504	726	221	2166	0
V/C Ratio(X)	0.30	0.00	0.93				0.00	0.76	0.76	0.83	0.32	0.00
Avail Cap(c_a), veh/h	530	0	832				0	1612	779	353	2544	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.6	0.0	30.7				0.0	20.6	20.7	38.2	8.1	0.0
Incr Delay (d2), s/veh	0.3	0.0	15.8				0.0	2.0	4.0	8.7	0.1	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
%ile BackOfQ(50%),veh/ln	3.0	0.0	10.7				0.0	12.1	12.1	5.0	4.1	0.0
LnGrp Delay(d),s/veh	24.9	0.0	46.5				0.0	22.6	24.7	46.9	8.2	0.0
LnGrp LOS	C		D					C	C	D	A	
Approach Vol, veh/h		902						1687			874	
Approach Delay, s/veh		42.8						23.3			16.3	
Approach LOS		D						C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	15.2	44.1		30.2		59.3		
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		
Max Green Setting (Gmax), s	18.0	43.0		27.0		65.0		
Max Q Clear Time (g_c+I1), s	11.1	27.4		25.5		10.4		
Green Ext Time (p_c), s	0.3	12.7		0.7		31.1		

Intersection Summary	
HCM 2010 Ctrl Delay	26.6
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	79	59	55	174	40	196	64	331	142	183	327	86
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1845	1845	1900	1845	1845	1845	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	86	64	60	189	43	106	70	360	0	199	355	93
Adj No. of Lanes	1	1	0	1	1	1	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	513	258	242	472	543	462	94	927	0	267	1001	259
Arrive On Green	0.29	0.29	0.29	0.29	0.29	0.29	0.05	0.26	0.00	0.15	0.36	0.36
Sat Flow, veh/h	1222	877	822	1250	1845	1568	1757	3597	0	1757	2758	713
Grp Volume(v), veh/h	86	0	124	189	43	106	70	360	0	199	224	224
Grp Sat Flow(s),veh/h/ln	1222	0	1700	1250	1845	1568	1757	1752	0	1757	1752	1719
Q Serve(g_s), s	2.3	0.0	2.3	5.6	0.7	2.1	1.6	3.5	0.0	4.5	3.9	4.0
Cycle Q Clear(g_c), s	3.0	0.0	2.3	7.9	0.7	2.1	1.6	3.5	0.0	4.5	3.9	4.0
Prop In Lane	1.00		0.48	1.00		1.00	1.00		0.00	1.00		0.42
Lane Grp Cap(c), veh/h	513	0	500	472	543	462	94	927	0	267	636	624
V/C Ratio(X)	0.17	0.00	0.25	0.40	0.08	0.23	0.75	0.39	0.00	0.75	0.35	0.36
Avail Cap(c_a), veh/h	1125	0	1352	1098	1468	1247	551	2535	0	1059	1774	1740
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.6	0.0	11.1	14.2	10.6	11.1	19.4	12.5	0.0	16.8	9.6	9.7
Incr Delay (d2), s/veh	0.2	0.0	0.3	0.5	0.1	0.3	11.1	0.3	0.0	4.1	0.3	0.3
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(50%),veh/ln	0.8	0.0	1.1	2.0	0.4	1.0	1.1	1.7	0.0	2.5	1.9	1.9
LnGrp Delay(d),s/veh	11.8	0.0	11.4	14.7	10.6	11.3	30.5	12.8	0.0	21.0	10.0	10.0
LnGrp LOS	B		B	B	B	B	C	B		C	A	B
Approach Vol, veh/h		210			338			430			647	
Approach Delay, s/veh		11.6			13.1			15.6			13.4	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.3	15.0		16.2	6.2	19.1		16.2
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	25.0	30.0		33.0	13.0	42.0		33.0
Max Q Clear Time (g_c+I1), s	6.5	5.5		5.0	3.6	6.0		9.9
Green Ext Time (p_c), s	0.5	5.5		2.4	0.1	5.9		2.3

Intersection Summary			
HCM 2010 Ctrl Delay			13.7
HCM 2010 LOS			B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	483	66	179	510	113	195
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1900	1845	1845	1845	1845
Adj Flow Rate, veh/h	525	72	195	554	123	107
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	1256	172	264	2322	219	195
Arrive On Green	0.41	0.41	0.15	0.66	0.12	0.12
Sat Flow, veh/h	3191	424	1757	3597	1757	1568
Grp Volume(v), veh/h	296	301	195	554	123	107
Grp Sat Flow(s),veh/h/ln	1752	1770	1757	1752	1757	1568
Q Serve(g_s), s	4.5	4.6	4.0	2.4	2.5	2.4
Cycle Q Clear(g_c), s	4.5	4.6	4.0	2.4	2.5	2.4
Prop In Lane		0.24	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	710	717	264	2322	219	195
V/C Ratio(X)	0.42	0.42	0.74	0.24	0.56	0.55
Avail Cap(c_a), veh/h	1588	1604	1264	6072	1264	1128
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.0	8.0	15.2	2.5	15.5	15.4
Incr Delay (d2), s/veh	0.4	0.4	4.0	0.1	2.3	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	2.3	2.2	1.1	1.3	1.2
LnGrp Delay(d),s/veh	8.4	8.4	19.2	2.6	17.7	17.8
LnGrp LOS	A	A	B	A	B	B
Approach Vol, veh/h	597			749	230	
Approach Delay, s/veh	8.4			6.9	17.8	
Approach LOS	A			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		8.7	9.6	19.2				28.9
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		27.0	27.0	34.0				65.0
Max Q Clear Time (g_c+I1), s		4.5	6.0	6.6				4.4
Green Ext Time (p_c), s		0.7	0.5	8.6				9.9

Intersection Summary			
HCM 2010 Ctrl Delay			9.1
HCM 2010 LOS			A

HCM 2010 Signalized Intersection Summary
5: SR 4 EB On-Ramps/SR 4 EB Off-Ramps & Laurel Road

10/26/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↱			↑↱					↰	↰	↱
Volume (veh/h)	0	697	75	0	616	487	0	0	0	450	1	160
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1900	0	1845	1900				1845	1845	1845
Adj Flow Rate, veh/h	0	758	82	0	670	0				490	0	174
Adj No. of Lanes	0	2	0	0	2	0				2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	0	3	3				3	3	3
Cap, veh/h	0	1791	194	0	1967	0				831	0	371
Arrive On Green	0.00	0.56	0.56	0.00	0.56	0.00				0.24	0.00	0.24
Sat Flow, veh/h	0	3283	345	0	3689	0				3514	0	1568
Grp Volume(v), veh/h	0	416	424	0	670	0				490	0	174
Grp Sat Flow(s),veh/h/ln	0	1752	1784	0	1752	0				1757	0	1568
Q Serve(g_s), s	0.0	5.4	5.4	0.0	4.1	0.0				4.9	0.0	3.8
Cycle Q Clear(g_c), s	0.0	5.4	5.4	0.0	4.1	0.0				4.9	0.0	3.8
Prop In Lane	0.00		0.19	0.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	983	1001	0	1967	0				831	0	371
V/C Ratio(X)	0.00	0.42	0.42	0.00	0.34	0.00				0.59	0.00	0.47
Avail Cap(c_a), veh/h	0	2570	2616	0	5139	0				3020	0	1348
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	5.0	5.0	0.0	4.7	0.0				13.4	0.0	13.0
Incr Delay (d2), s/veh	0.0	0.3	0.3	0.0	0.1	0.0				0.7	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.6	2.7	0.0	2.0	0.0				2.4	0.0	1.7
LnGrp Delay(d),s/veh	0.0	5.3	5.3	0.0	4.8	0.0				14.1	0.0	13.9
LnGrp LOS		A	A		A					B		B
Approach Vol, veh/h		840			670						664	
Approach Delay, s/veh		5.3			4.8						14.0	
Approach LOS		A			A						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				26.2		13.4		26.2
Change Period (Y+Rc), s				4.0		4.0		4.0
Max Green Setting (Gmax), s				58.0		34.0		58.0
Max Q Clear Time (g_c+I1), s				7.4		6.9		6.1
Green Ext Time (p_c), s				14.8		2.5		14.9

Intersection Summary	
HCM 2010 Ctrl Delay	7.8
HCM 2010 LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

HCM 2010 Signalized Intersection Summary
6: SR 4 WB Off-Ramps/SR 4 WB On-Ramps & Laurel Road

10/26/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑			↑↑	↱		↰	↱			
Volume (veh/h)	227	921	0	0	1092	725	26	0	318	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	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			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1845	1845	0	0	1845	1845	1900	1845	1845			
Adj Flow Rate, veh/h	247	1001	0	0	1187	0	28	0	346			
Adj No. of Lanes	1	2	0	0	2	1	0	1	1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	289	2293	0	0	1547	692	438	0	391			
Arrive On Green	0.16	0.65	0.00	0.00	0.44	0.00	0.25	0.00	0.25			
Sat Flow, veh/h	1757	3597	0	0	3597	1568	1757	0	1568			
Grp Volume(v), veh/h	247	1001	0	0	1187	0	28	0	346			
Grp Sat Flow(s),veh/h/ln	1757	1752	0	0	1752	1568	1757	0	1568			
Q Serve(g_s), s	11.3	11.4	0.0	0.0	23.7	0.0	1.0	0.0	17.6			
Cycle Q Clear(g_c), s	11.3	11.4	0.0	0.0	23.7	0.0	1.0	0.0	17.6			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	289	2293	0	0	1547	692	438	0	391			
V/C Ratio(X)	0.85	0.44	0.00	0.00	0.77	0.00	0.06	0.00	0.89			
Avail Cap(c_a), veh/h	403	2624	0	0	1651	739	637	0	568			
HCM Platoon Ratio	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	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	33.6	6.9	0.0	0.0	19.5	0.0	23.7	0.0	30.0			
Incr Delay (d2), s/veh	12.1	0.1	0.0	0.0	2.1	0.0	0.1	0.0	11.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	6.5	5.5	0.0	0.0	11.8	0.0	0.5	0.0	8.8			
LnGrp Delay(d),s/veh	45.8	7.1	0.0	0.0	21.6	0.0	23.8	0.0	41.3			
LnGrp LOS	D	A			C		C		D			
Approach Vol, veh/h		1248			1187			374				
Approach Delay, s/veh		14.7			21.6			40.0				
Approach LOS		B			C			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		24.6		58.2			17.6	40.5
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		30.0		62.0			19.0	39.0
Max Q Clear Time (g_c+I1), s		19.6		13.4			13.3	25.7
Green Ext Time (p_c), s		1.0		27.8			0.4	10.9

Intersection Summary	
HCM 2010 Ctrl Delay	21.0
HCM 2010 LOS	C

HCM 2010 Signalized Intersection Summary
7: SR 4 EB On-ramps/SR 4 EB Off-Ramps & Lone Tree Way

10/26/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	783	434	95	1180	0	0	0	0	318	1	393
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1845	1845	1845	0				1845	1845	1845
Adj Flow Rate, veh/h	0	851	472	103	1283	0				347	0	427
Adj No. of Lanes	0	3	1	2	3	0				2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	2276	709	174	2823	0				1139	0	508
Arrive On Green	0.00	0.45	0.45	0.05	0.56	0.00				0.32	0.00	0.32
Sat Flow, veh/h	0	5202	1568	3408	5202	0				3514	0	1568
Grp Volume(v), veh/h	0	851	472	103	1283	0				347	0	427
Grp Sat Flow(s),veh/h/ln	0	1679	1568	1704	1679	0				1757	0	1568
Q Serve(g_s), s	0.0	7.7	16.4	2.1	10.4	0.0				5.1	0.0	17.6
Cycle Q Clear(g_c), s	0.0	7.7	16.4	2.1	10.4	0.0				5.1	0.0	17.6
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2276	709	174	2823	0				1139	0	508
V/C Ratio(X)	0.00	0.37	0.67	0.59	0.45	0.00				0.30	0.00	0.84
Avail Cap(c_a), veh/h	0	2463	767	343	3260	0				2376	0	1060
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	12.6	14.9	32.3	9.0	0.0				17.6	0.0	21.8
Incr Delay (d2), s/veh	0.0	0.1	2.0	3.2	0.1	0.0				0.1	0.0	3.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.6	7.5	1.0	4.8	0.0				2.5	0.0	8.1
LnGrp Delay(d),s/veh	0.0	12.7	16.9	35.4	9.1	0.0				17.8	0.0	25.6
LnGrp LOS		B	B	D	A					B		C
Approach Vol, veh/h		1323			1386						774	
Approach Delay, s/veh		14.2			11.1						22.1	
Approach LOS		B			B						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			7.6	35.4		26.5		43.0
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			7.0	34.0		47.0		45.0
Max Q Clear Time (g_c+I1), s			4.1	18.4		19.6		12.4
Green Ext Time (p_c), s			0.1	13.0		3.0		23.4

Intersection Summary		
HCM 2010 Ctrl Delay		14.7
HCM 2010 LOS		B

Notes

User approved volume balancing among the lanes for turning movement.

HCM 2010 Signalized Intersection Summary
8: Jefferey Way /SR 4 WB On-Ramps & Lone Tree Way

10/26/2015

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (veh/h)	0	956	166	8	3	850	311	429	19	138	0	0
Number	7	4	14		3	8	18	5	2	12		
Initial Q (Qb), veh	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		
Parking Bus, Adj	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	0	1845	1845		1845	1845	1845	1845	1845	1845		
Adj Flow Rate, veh/h	0	1039	90		3	924	338	481	0	150		
Adj No. of Lanes	0	3	1		1	3	1	2	0	1		
Peak Hour Factor	0.92	0.92	0.92		0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	0	3	3		3	3	3	3	3	3		
Cap, veh/h	0	2783	867		6	3197	995	728	0	325		
Arrive On Green	0.00	0.55	0.55		0.00	0.63	0.63	0.21	0.00	0.21		
Sat Flow, veh/h	0	5202	1568		1757	5036	1568	3514	0	1568		
Grp Volume(v), veh/h	0	1039	90		3	924	338	481	0	150		
Grp Sat Flow(s),veh/h/ln	0	1679	1568		1757	1679	1568	1757	0	1568		
Q Serve(g_s), s	0.0	5.9	1.4		0.1	4.2	5.1	6.4	0.0	4.2		
Cycle Q Clear(g_c), s	0.0	5.9	1.4		0.1	4.2	5.1	6.4	0.0	4.2		
Prop In Lane	0.00		1.00		1.00		1.00	1.00		1.00		
Lane Grp Cap(c), veh/h	0	2783	867		6	3197	995	728	0	325		
V/C Ratio(X)	0.00	0.37	0.10		0.52	0.29	0.34	0.66	0.00	0.46		
Avail Cap(c_a), veh/h	0	2783	867		1214	6561	2043	1803	0	805		
HCM Platoon Ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	0.00	1.00	1.00		1.00	1.00	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	0.0	6.4	5.4		25.2	4.1	4.3	18.4	0.0	17.6		
Incr Delay (d2), s/veh	0.0	0.1	0.1		58.5	0.0	0.2	1.0	0.0	1.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	0.0	2.7	0.6		0.1	1.9	2.2	3.2	0.0	1.9		
LnGrp Delay(d),s/veh	0.0	6.5	5.4		83.7	4.2	4.5	19.5	0.0	18.6		
LnGrp LOS		A	A		F	A	A	B		B		
Approach Vol, veh/h		1129				1265			631			
Approach Delay, s/veh		6.4				4.5			19.3			
Approach LOS		A				A			B			

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		14.5	4.2	32.0				36.2
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		26.0	35.0	27.0				66.0
Max Q Clear Time (g_c+I1), s		8.4	2.1	7.9				7.1
Green Ext Time (p_c), s		2.1	0.0	13.6				25.1

Intersection Summary		
HCM 2010 Ctrl Delay		8.3
HCM 2010 LOS		A

Notes

User approved volume balancing among the lanes for turning movement.

Movement	SBR
Lane Configurations	
Volume (veh/h)	0
Number	
Initial Q (Qb), veh	
Ped-Bike Adj(A_pbT)	
Parking Bus, Adj	
Adj Sat Flow, veh/h/ln	
Adj Flow Rate, veh/h	
Adj No. of Lanes	
Peak Hour Factor	
Percent Heavy Veh, %	
Cap, veh/h	
Arrive On Green	
Sat Flow, veh/h	
Grp Volume(v), veh/h	
Grp Sat Flow(s),veh/h/ln	
Q Serve(g_s), s	
Cycle Q Clear(g_c), s	
Prop In Lane	
Lane Grp Cap(c), veh/h	
V/C Ratio(X)	
Avail Cap(c_a), veh/h	
HCM Platoon Ratio	
Upstream Filter(I)	
Uniform Delay (d), s/veh	
Incr Delay (d2), s/veh	
Initial Q Delay(d3),s/veh	
%ile BackOfQ(50%),veh/ln	
LnGrp Delay(d),s/veh	
LnGrp LOS	
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	

Timer

User approved ignoring U-Turning movement.

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Volume (veh/h)	43	131	470	41	61	610	92	15	107	88	47	25
Number		7	4	14	3	8	18		5	2	12	
Initial Q (Qb), veh		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	
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Adj Sat Flow, veh/h/ln		1845	1845	1845	1845	1845	1845		1845	1845	1845	
Adj Flow Rate, veh/h		142	511	23	66	663	50		116	96	26	
Adj No. of Lanes		1	3	1	1	3	1		2	1	1	
Peak Hour Factor		0.92	0.92	0.92	0.92	0.92	0.92		0.92	0.92	0.92	
Percent Heavy Veh, %		3	3	3	3	3	3		3	3	3	
Cap, veh/h		192	1751	545	89	1456	453		238	287	244	
Arrive On Green		0.11	0.35	0.35	0.05	0.29	0.29		0.07	0.16	0.16	
Sat Flow, veh/h		1757	5036	1568	1757	5036	1568		3408	1845	1568	
Grp Volume(v), veh/h		142	511	23	66	663	50		116	96	26	
Grp Sat Flow(s),veh/h/ln		1757	1679	1568	1757	1679	1568		1704	1845	1568	
Q Serve(g_s), s		3.4	3.2	0.4	1.6	4.6	1.0		1.4	2.0	0.6	
Cycle Q Clear(g_c), s		3.4	3.2	0.4	1.6	4.6	1.0		1.4	2.0	0.6	
Prop In Lane		1.00		1.00	1.00		1.00		1.00		1.00	
Lane Grp Cap(c), veh/h		192	1751	545	89	1456	453		238	287	244	
V/C Ratio(X)		0.74	0.29	0.04	0.74	0.46	0.11		0.49	0.33	0.11	
Avail Cap(c_a), veh/h		1964	6452	2009	368	1877	584		318	687	584	
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Upstream Filter(I)		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Uniform Delay (d), s/veh		18.5	10.2	9.3	20.1	12.5	11.2		19.2	16.1	15.6	
Incr Delay (d2), s/veh		5.5	0.1	0.0	11.3	0.2	0.1		1.5	0.7	0.2	
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln		1.9	1.5	0.2	1.1	2.2	0.4		0.7	1.1	0.3	
LnGrp Delay(d),s/veh		24.0	10.3	9.3	31.4	12.7	11.3		20.8	16.8	15.8	
LnGrp LOS		C	B	A	C	B	B		C	B	B	
Approach Vol, veh/h			676			779				238		
Approach Delay, s/veh			13.1			14.2				18.6		
Approach LOS			B			B				B		

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.2	10.7	6.2	18.9	7.0	10.8	8.7	16.4
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.0	16.0	9.0	55.0	4.0	16.0	48.0	16.0
Max Q Clear Time (g_c+I1), s	3.6	4.0	3.6	5.2	3.4	5.3	5.4	6.6
Green Ext Time (p_c), s	0.0	1.7	0.0	9.8	0.0	1.6	0.4	5.0

Intersection Summary	
HCM 2010 Ctrl Delay	15.3
HCM 2010 LOS	B

Notes

User approved ignoring U-Turning movement.

HCM 2010 Signalized Intersection Summary
9: Empire Avenue & Lone Tree Way

10/26/2015

Movement	SBL	SBT	SBR
Lane Configurations			
Volume (veh/h)	120	126	119
Number	1	6	16
Initial Q (Qb), veh	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900
Adj Flow Rate, veh/h	130	137	129
Adj No. of Lanes	2	2	0
Peak Hour Factor	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3
Cap, veh/h	250	283	246
Arrive On Green	0.07	0.16	0.16
Sat Flow, veh/h	3408	1778	1546
Grp Volume(v), veh/h	130	135	131
Grp Sat Flow(s),veh/h/ln	1704	1752	1572
Q Serve(g_s), s	1.6	3.0	3.3
Cycle Q Clear(g_c), s	1.6	3.0	3.3
Prop In Lane	1.00		0.98
Lane Grp Cap(c), veh/h	250	279	250
V/C Ratio(X)	0.52	0.48	0.52
Avail Cap(c_a), veh/h	318	653	586
HCM Platoon Ratio	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.2	16.4	16.6
Incr Delay (d2), s/veh	1.7	1.3	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	1.6	1.5
LnGrp Delay(d),s/veh	20.8	17.7	18.3
LnGrp LOS	C	B	B
Approach Vol, veh/h		396	
Approach Delay, s/veh		18.9	
Approach LOS		B	

Timer

HCM 2010 Signalized Intersection Summary
10: Laurel Road & Country Hills Road

10/26/2015

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	9	669	675	27	79	11
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1845	1900	1845	1845
Adj Flow Rate, veh/h	10	727	734	29	86	12
Adj No. of Lanes	1	2	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	19	2465	1991	79	123	110
Arrive On Green	0.01	0.70	0.58	0.58	0.07	0.07
Sat Flow, veh/h	1757	3597	3530	136	1757	1568
Grp Volume(v), veh/h	10	727	374	389	86	12
Grp Sat Flow(s),veh/h/ln	1757	1752	1752	1821	1757	1568
Q Serve(g_s), s	0.2	2.7	4.0	4.0	1.7	0.3
Cycle Q Clear(g_c), s	0.2	2.7	4.0	4.0	1.7	0.3
Prop In Lane	1.00			0.07	1.00	1.00
Lane Grp Cap(c), veh/h	19	2465	1015	1055	123	110
V/C Ratio(X)	0.54	0.29	0.37	0.37	0.70	0.11
Avail Cap(c_a), veh/h	398	6756	2782	2890	1195	1067
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.4	2.0	4.0	4.0	16.0	15.4
Incr Delay (d2), s/veh	22.0	0.1	0.2	0.2	7.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.2	1.9	2.0	1.1	0.2
LnGrp Delay(d),s/veh	39.4	2.0	4.2	4.2	23.0	15.8
LnGrp LOS	D	A	A	A	C	B
Approach Vol, veh/h		737	763		98	
Approach Delay, s/veh		2.5	4.2		22.2	
Approach LOS		A	A		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				28.8		6.5	4.4	24.4
Change Period (Y+Rc), s				4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s				68.0		24.0	8.0	56.0
Max Q Clear Time (g_c+I1), s				4.7		3.7	2.2	6.0
Green Ext Time (p_c), s				15.0		0.2	0.0	14.4

Intersection Summary		
HCM 2010 Ctrl Delay		4.5
HCM 2010 LOS		A

HCM 2010 Signalized Intersection Summary
1: Hillcrest Ave & SR4 WB Ramps

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	648	555	876	141
Number			5	2	6	16
Initial Q (Qb), veh			0	0	0	0
Ped-Bike Adj(A_pbT)			1.00			1.00
Parking Bus, Adj			1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln			1845	1845	1845	1900
Adj Flow Rate, veh/h			704	603	952	0
Adj No. of Lanes			2	1	2	0
Peak Hour Factor			0.92	0.92	0.92	0.92
Percent Heavy Veh, %			3	3	3	3
Cap, veh/h			977	1686	1898	0
Arrive On Green			0.29	0.91	0.54	0.00
Sat Flow, veh/h			3408	1845	3689	0
Grp Volume(v), veh/h			704	603	952	0
Grp Sat Flow(s),veh/h/ln			1704	1845	1752	0
Q Serve(g_s), s			8.7	1.9	8.0	0.0
Cycle Q Clear(g_c), s			8.7	1.9	8.0	0.0
Prop In Lane			1.00			0.00
Lane Grp Cap(c), veh/h			977	1686	1898	0
V/C Ratio(X)			0.72	0.36	0.50	0.00
Avail Cap(c_a), veh/h			2705	3799	4136	0
HCM Platoon Ratio			1.00	1.00	1.00	1.00
Upstream Filter(I)			1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh			14.9	0.3	6.7	0.0
Incr Delay (d2), s/veh			1.0	0.1	0.2	0.0
Initial Q Delay(d3),s/veh			0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln			4.1	0.9	3.9	0.0
LnGrp Delay(d),s/veh			16.0	0.4	6.9	0.0
LnGrp LOS			B	A	A	
Approach Vol, veh/h				1307	952	
Approach Delay, s/veh				8.8	6.9	
Approach LOS				A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		
Phs Duration (G+Y+Rc), s		46.6			17.4	29.2		
Change Period (Y+Rc), s		4.0			4.0	4.0		
Max Green Setting (Gmax), s		96.0			37.0	55.0		
Max Q Clear Time (g_c+I1), s		3.9			10.7	10.0		
Green Ext Time (p_c), s		17.0			2.7	15.3		

Intersection Summary			
HCM 2010 Ctrl Delay			8.0
HCM 2010 LOS			A

HCM 2010 Signalized Intersection Summary
2: Hillcrest Ave & SR 4 EBRamps/SR 4 EB Ramps

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	122	0	730	0	0	0	0	1083	398	182	688	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1845				0	1845	1900	1845	1845	0
Adj Flow Rate, veh/h	128	0	768				0	1140	419	192	724	0
Adj No. of Lanes	0	1	2				0	3	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	540	0	848				0	1539	565	231	2107	0
Arrive On Green	0.31	0.00	0.31				0.00	0.42	0.42	0.13	0.60	0.00
Sat Flow, veh/h	1757	0	2760				0	3798	1334	1757	3597	0
Grp Volume(v), veh/h	128	0	768				0	1054	505	192	724	0
Grp Sat Flow(s),veh/h/ln	1757	0	1380				0	1679	1609	1757	1752	0
Q Serve(g_s), s	4.8	0.0	23.3				0.0	23.0	23.0	9.3	9.1	0.0
Cycle Q Clear(g_c), s	4.8	0.0	23.3				0.0	23.0	23.0	9.3	9.1	0.0
Prop In Lane	1.00		1.00				0.00		0.83	1.00		0.00
Lane Grp Cap(c), veh/h	540	0	848				0	1422	682	231	2107	0
V/C Ratio(X)	0.24	0.00	0.91				0.00	0.74	0.74	0.83	0.34	0.00
Avail Cap(c_a), veh/h	584	0	917				0	1539	738	383	2531	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.6	0.0	29.0				0.0	21.1	21.1	36.9	8.7	0.0
Incr Delay (d2), s/veh	0.2	0.0	11.9				0.0	1.8	3.7	7.6	0.1	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
%ile BackOfQ(50%),veh/ln	2.3	0.0	10.3				0.0	10.9	10.8	5.0	4.4	0.0
LnGrp Delay(d),s/veh	22.8	0.0	40.9				0.0	22.9	24.8	44.5	8.8	0.0
LnGrp LOS	C		D					C	C	D	A	
Approach Vol, veh/h		896						1559			916	
Approach Delay, s/veh		38.3						23.5			16.3	
Approach LOS		D						C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	15.5	41.0		30.8		56.4		
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		
Max Green Setting (Gmax), s	19.0	40.0		29.0		63.0		
Max Q Clear Time (g_c+I1), s	11.3	25.0		25.3		11.1		
Green Ext Time (p_c), s	0.3	11.9		1.5		28.4		

Intersection Summary			
HCM 2010 Ctrl Delay			25.5
HCM 2010 LOS			C

3: Hillcrest Ave & Laurel Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	27	15	21	229	138	131	27	373	119	189	454	38
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1845	1845	1900	1845	1845	1845	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	28	16	22	241	145	70	28	393	0	199	478	40
Adj No. of Lanes	1	1	0	1	1	1	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	419	195	268	523	510	434	47	999	0	266	1342	112
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.03	0.28	0.00	0.15	0.41	0.41
Sat Flow, veh/h	1150	705	969	1351	1845	1568	1757	3597	0	1757	3276	273
Grp Volume(v), veh/h	28	0	38	241	145	70	28	393	0	199	255	263
Grp Sat Flow(s),veh/h/ln	1150	0	1674	1351	1845	1568	1757	1752	0	1757	1752	1796
Q Serve(g_s), s	0.8	0.0	0.7	6.7	2.6	1.4	0.7	3.8	0.0	4.5	4.2	4.2
Cycle Q Clear(g_c), s	3.4	0.0	0.7	7.4	2.6	1.4	0.7	3.8	0.0	4.5	4.2	4.2
Prop In Lane	1.00		0.58	1.00		1.00	1.00		0.00	1.00		0.15
Lane Grp Cap(c), veh/h	419	0	463	523	510	434	47	999	0	266	718	736
V/C Ratio(X)	0.07	0.00	0.08	0.46	0.28	0.16	0.60	0.39	0.00	0.75	0.36	0.36
Avail Cap(c_a), veh/h	1064	0	1401	1280	1544	1312	294	2431	0	1008	1928	1976
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.2	0.0	11.2	13.9	11.9	11.5	20.1	12.0	0.0	17.0	8.5	8.5
Incr Delay (d2), s/veh	0.1	0.0	0.1	0.6	0.3	0.2	11.7	0.3	0.0	4.2	0.3	0.3
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(50%),veh/ln	0.3	0.0	0.3	2.6	1.3	0.6	0.5	1.8	0.0	2.5	2.0	2.1
LnGrp Delay(d),s/veh	13.3	0.0	11.3	14.6	12.2	11.6	31.9	12.3	0.0	21.2	8.8	8.8
LnGrp LOS	B		B	B	B	B	C	B		C	A	A
Approach Vol, veh/h		66			456			421			717	
Approach Delay, s/veh		12.1			13.4			13.6			12.2	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.3	15.9		15.6	5.1	21.1		15.6
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	24.0	29.0		35.0	7.0	46.0		35.0
Max Q Clear Time (g_c+I1), s	6.5	5.8		5.4	2.7	6.2		9.4
Green Ext Time (p_c), s	0.5	6.1		2.2	0.0	6.9		2.2

Intersection Summary			
HCM 2010 Ctrl Delay			12.9
HCM 2010 LOS			B

HCM 2010 Signalized Intersection Summary
4: Canada Valley Road & Laurel Road
10/26/2015

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	423	48	153	600	102	189
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1900	1845	1845	1845	1845
Adj Flow Rate, veh/h	460	52	166	652	111	103
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	1296	146	225	2281	211	188
Arrive On Green	0.41	0.41	0.13	0.65	0.12	0.12
Sat Flow, veh/h	3269	358	1757	3597	1757	1568
Grp Volume(v), veh/h	253	259	166	652	111	103
Grp Sat Flow(s),veh/h/ln	1752	1782	1757	1752	1757	1568
Q Serve(g_s), s	3.5	3.5	3.2	2.8	2.1	2.2
Cycle Q Clear(g_c), s	3.5	3.5	3.2	2.8	2.1	2.2
Prop In Lane		0.20	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	715	727	225	2281	211	188
V/C Ratio(X)	0.35	0.36	0.74	0.29	0.53	0.55
Avail Cap(c_a), veh/h	1606	1633	1308	6224	1510	1347
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.1	7.2	14.6	2.6	14.4	14.5
Incr Delay (d2), s/veh	0.3	0.3	4.6	0.1	2.0	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	1.8	1.8	1.3	1.1	1.1
LnGrp Delay(d),s/veh	7.4	7.5	19.3	2.7	16.5	16.9
LnGrp LOS	A	A	B	A	B	B
Approach Vol, veh/h	512			818	214	
Approach Delay, s/veh	7.5			6.1	16.7	
Approach LOS	A			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		8.2	8.5	18.2				26.7
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		30.0	26.0	32.0				62.0
Max Q Clear Time (g_c+I1), s		4.2	5.2	5.5				4.8
Green Ext Time (p_c), s		0.6	0.4	8.7				10.2

Intersection Summary			
HCM 2010 Ctrl Delay			8.0
HCM 2010 LOS			A

Laurel Ranch Traffic Impact Analysis
PM Existing Conditions
Synchro 8 Report

HCM 2010 Signalized Intersection Summary
5: SR 4 EB On-Ramps/SR 4 EB Off-Ramps & Laurel Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	602	42	0	946	360	0	0	0	896	2	417
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1900	0	1845	1900				1845	1845	1845
Adj Flow Rate, veh/h	0	654	46	0	1028	0				975	0	453
Adj No. of Lanes	0	2	0	0	2	0				2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	0	3	3				3	3	3
Cap, veh/h	0	1639	115	0	1729	0				1340	0	598
Arrive On Green	0.00	0.49	0.49	0.00	0.49	0.00				0.38	0.00	0.38
Sat Flow, veh/h	0	3415	233	0	3689	0				3514	0	1568
Grp Volume(v), veh/h	0	345	355	0	1028	0				975	0	453
Grp Sat Flow(s),veh/h/ln	0	1752	1803	0	1752	0				1757	0	1568
Q Serve(g_s), s	0.0	7.9	7.9	0.0	13.4	0.0				15.2	0.0	16.0
Cycle Q Clear(g_c), s	0.0	7.9	7.9	0.0	13.4	0.0				15.2	0.0	16.0
Prop In Lane	0.00		0.13	0.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	864	890	0	1729	0				1340	0	598
V/C Ratio(X)	0.00	0.40	0.40	0.00	0.59	0.00				0.73	0.00	0.76
Avail Cap(c_a), veh/h	0	1346	1385	0	2692	0				2369	0	1057
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	10.2	10.2	0.0	11.6	0.0				16.9	0.0	17.2
Incr Delay (d2), s/veh	0.0	0.3	0.3	0.0	0.3	0.0				0.8	0.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.9	4.0	0.0	6.5	0.0				7.5	0.0	7.3
LnGrp Delay(d),s/veh	0.0	10.5	10.5	0.0	11.9	0.0				17.7	0.0	19.2
LnGrp LOS		B	B		B					B		B
Approach Vol, veh/h		700			1028						1428	
Approach Delay, s/veh		10.5			11.9						18.1	
Approach LOS		B			B						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				35.5		28.3		35.5
Change Period (Y+Rc), s				4.0		4.0		4.0
Max Green Setting (Gmax), s				49.0		43.0		49.0
Max Q Clear Time (g_c+I1), s				9.9		18.0		15.4
Green Ext Time (p_c), s				17.1		6.3		16.0

Intersection Summary		
HCM 2010 Ctrl Delay		14.4
HCM 2010 LOS		B

Notes

User approved volume balancing among the lanes for turning movement.

HCM 2010 Signalized Intersection Summary
6: SR 4 WB Off-Ramps/SR 4 WB On-Ramps & Laurel Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	98	1399	0	0	1265	465	128	0	497	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	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			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1845	1845	0	0	1845	1845	1900	1845	1845			
Adj Flow Rate, veh/h	107	1521	0	0	1375	0	139	0	540			
Adj No. of Lanes	1	2	0	0	2	1	0	1	1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	128	1924	0	0	1524	682	646	0	577			
Arrive On Green	0.07	0.55	0.00	0.00	0.43	0.00	0.37	0.00	0.37			
Sat Flow, veh/h	1757	3597	0	0	3597	1568	1757	0	1568			
Grp Volume(v), veh/h	107	1521	0	0	1375	0	139	0	540			
Grp Sat Flow(s),veh/h/ln	1757	1752	0	0	1752	1568	1757	0	1568			
Q Serve(g_s), s	5.8	33.3	0.0	0.0	35.1	0.0	5.2	0.0	31.9			
Cycle Q Clear(g_c), s	5.8	33.3	0.0	0.0	35.1	0.0	5.2	0.0	31.9			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	128	1924	0	0	1524	682	646	0	577			
V/C Ratio(X)	0.84	0.79	0.00	0.00	0.90	0.00	0.22	0.00	0.94			
Avail Cap(c_a), veh/h	128	1931	0	0	1530	685	712	0	636			
HCM Platoon Ratio	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	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	44.0	17.3	0.0	0.0	25.3	0.0	20.9	0.0	29.3			
Incr Delay (d2), s/veh	36.1	2.3	0.0	0.0	7.8	0.0	0.2	0.0	20.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.1	16.5	0.0	0.0	18.5	0.0	2.6	0.0	17.1			
LnGrp Delay(d),s/veh	80.1	19.6	0.0	0.0	33.1	0.0	21.0	0.0	49.8			
LnGrp LOS	F	B			C		C		D			
Approach Vol, veh/h		1628			1375			679				
Approach Delay, s/veh		23.6			33.1			43.9				
Approach LOS		C			C			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		39.4		56.8			11.0	45.8
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		39.0		53.0			7.0	42.0
Max Q Clear Time (g_c+I1), s		33.9		35.3			7.8	37.1
Green Ext Time (p_c), s		1.4		16.2			0.0	4.7

Intersection Summary		
HCM 2010 Ctrl Delay		30.9
HCM 2010 LOS		C

HCM 2010 Signalized Intersection Summary
7: SR 4 EB On-ramps/SR 4 EB Off-Ramps & Lone Tree Way

10/26/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1415	497	120	1383	0	0	0	0	461	2	374
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1845	1845	1845	0				1845	1845	1845
Adj Flow Rate, veh/h	0	1489	523	126	1456	0				486	0	394
Adj No. of Lanes	0	3	1	2	3	0				2	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	2467	768	200	3016	0				1056	0	471
Arrive On Green	0.00	0.49	0.49	0.06	0.60	0.00				0.30	0.00	0.30
Sat Flow, veh/h	0	5202	1568	3408	5202	0				3514	0	1568
Grp Volume(v), veh/h	0	1489	523	126	1456	0				486	0	394
Grp Sat Flow(s),veh/h/ln	0	1679	1568	1704	1679	0				1757	0	1568
Q Serve(g_s), s	0.0	17.0	20.3	2.9	13.0	0.0				8.9	0.0	18.7
Cycle Q Clear(g_c), s	0.0	17.0	20.3	2.9	13.0	0.0				8.9	0.0	18.7
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2467	768	200	3016	0				1056	0	471
V/C Ratio(X)	0.00	0.60	0.68	0.63	0.48	0.00				0.46	0.00	0.84
Avail Cap(c_a), veh/h	0	2534	789	343	3294	0				1768	0	789
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	14.7	15.5	36.6	9.0	0.0				22.6	0.0	26.0
Incr Delay (d2), s/veh	0.0	0.4	2.3	3.3	0.1	0.0				0.3	0.0	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.9	9.2	1.4	6.0	0.0				4.4	0.0	8.6
LnGrp Delay(d),s/veh	0.0	15.1	17.8	39.8	9.1	0.0				22.9	0.0	30.0
LnGrp LOS		B	B	D	A					C		C
Approach Vol, veh/h		2012			1582						880	
Approach Delay, s/veh		15.8			11.6						26.1	
Approach LOS		B			B						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			8.7	42.9		27.9		51.6
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			8.0	40.0		40.0		52.0
Max Q Clear Time (g_c+I1), s			4.9	22.3		20.7		15.0
Green Ext Time (p_c), s			0.1	16.6		3.2		32.6

Intersection Summary	
HCM 2010 Ctrl Delay	16.3
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

HCM 2010 Signalized Intersection Summary
8: Jefferey Way /SR 4 WB On-Ramps & Lone Tree Way

10/26/2015

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (veh/h)	0	1611	285	20	5	982	384	539	29	189	0	0
Number	7	4	14		3	8	18	5	2	12		
Initial Q (Qb), veh	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		
Parking Bus, Adj	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	0	1845	1845		1845	1845	1845	1845	1845	1845		
Adj Flow Rate, veh/h	0	1696	153		5	1034	404	589	0	199		
Adj No. of Lanes	0	3	1		1	3	1	2	0	1		
Peak Hour Factor	0.95	0.95	0.95		0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	0	3	3		3	3	3	3	3	3		
Cap, veh/h	0	3028	943		9	3343	1041	780	0	348		
Arrive On Green	0.00	0.60	0.60		0.01	0.66	0.66	0.22	0.00	0.22		
Sat Flow, veh/h	0	5202	1568		1757	5036	1568	3514	0	1568		
Grp Volume(v), veh/h	0	1696	153		5	1034	404	589	0	199		
Grp Sat Flow(s),veh/h/ln	0	1679	1568		1757	1679	1568	1757	0	1568		
Q Serve(g_s), s	0.0	14.2	3.0		0.2	6.1	8.2	11.0	0.0	7.9		
Cycle Q Clear(g_c), s	0.0	14.2	3.0		0.2	6.1	8.2	11.0	0.0	7.9		
Prop In Lane	0.00		1.00		1.00		1.00	1.00		1.00		
Lane Grp Cap(c), veh/h	0	3028	943		9	3343	1041	780	0	348		
V/C Ratio(X)	0.00	0.56	0.16		0.54	0.31	0.39	0.76	0.00	0.57		
Avail Cap(c_a), veh/h	0	3028	943		552	4679	1457	1356	0	605		
HCM Platoon Ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	0.00	1.00	1.00		1.00	1.00	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	0.0	8.4	6.2		34.7	5.0	5.3	25.4	0.0	24.3		
Incr Delay (d2), s/veh	0.0	0.2	0.1		40.7	0.1	0.2	1.5	0.0	1.5		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	0.0	6.5	1.3		0.2	2.8	3.5	5.5	0.0	3.5		
LnGrp Delay(d),s/veh	0.0	8.6	6.2		75.4	5.0	5.6	27.0	0.0	25.7		
LnGrp LOS		A	A		E	A	A	C		C		
Approach Vol, veh/h		1849				1443			788			
Approach Delay, s/veh		8.4				5.4			26.7			
Approach LOS		A				A			C			

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		19.5	4.4	46.1				50.4
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		27.0	22.0	39.0				65.0
Max Q Clear Time (g_c+I1), s		13.0	2.2	16.2				10.2
Green Ext Time (p_c), s		2.6	0.0	19.8				36.3

Intersection Summary	
HCM 2010 Ctrl Delay	10.9
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

HCM 2010 Signalized Intersection Summary
8: Jefferey Way /SR 4 WB On-Ramps & Lone Tree Way

Movement	SBR
Lane Configurations	
Volume (veh/h)	0
Number	
Initial Q (Qb), veh	
Ped-Bike Adj(A_pbT)	
Parking Bus, Adj	
Adj Sat Flow, veh/h/ln	
Adj Flow Rate, veh/h	
Adj No. of Lanes	
Peak Hour Factor	
Percent Heavy Veh, %	
Cap, veh/h	
Arrive On Green	
Sat Flow, veh/h	
Grp Volume(v), veh/h	
Grp Sat Flow(s),veh/h/ln	
Q Serve(g_s), s	
Cycle Q Clear(g_c), s	
Prop In Lane	
Lane Grp Cap(c), veh/h	
V/C Ratio(X)	
Avail Cap(c_a), veh/h	
HCM Platoon Ratio	
Upstream Filter(I)	
Uniform Delay (d), s/veh	
Incr Delay (d2), s/veh	
Initial Q Delay(d3),s/veh	
%ile BackOfQ(50%),veh/ln	
LnGrp Delay(d),s/veh	
LnGrp LOS	
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer	

User approved ignoring U-Turning movement.

HCM 2010 Signalized Intersection Summary
9: Empire Avenue & Lone Tree Way

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Volume (veh/h)	101	240	810	95	90	749	157	16	94	94	37	59
Number		7	4	14	3	8	18		5	2	12	
Initial Q (Qb), veh		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	
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Adj Sat Flow, veh/h/ln		1845	1845	1845	1845	1845	1845		1845	1845	1845	
Adj Flow Rate, veh/h		253	853	52	95	788	86		99	99	20	
Adj No. of Lanes		1	3	1	1	3	1		2	1	1	
Peak Hour Factor		0.95	0.95	0.95	0.95	0.95	0.95		0.95	0.95	0.95	
Percent Heavy Veh, %		3	3	3	3	3	3		3	3	3	
Cap, veh/h		320	2079	647	123	1514	471		191	235	200	
Arrive On Green		0.18	0.41	0.41	0.07	0.30	0.30		0.06	0.13	0.13	
Sat Flow, veh/h		1757	5036	1568	1757	5036	1568		3408	1845	1568	
Grp Volume(v), veh/h		253	853	52	95	788	86		99	99	20	
Grp Sat Flow(s),veh/h/ln		1757	1679	1568	1757	1679	1568		1704	1845	1568	
Q Serve(g_s), s		7.7	6.7	1.1	3.0	7.3	2.3		1.6	2.8	0.6	
Cycle Q Clear(g_c), s		7.7	6.7	1.1	3.0	7.3	2.3		1.6	2.8	0.6	
Prop In Lane		1.00		1.00	1.00		1.00		1.00		1.00	
Lane Grp Cap(c), veh/h		320	2079	647	123	1514	471		191	235	200	
V/C Ratio(X)		0.79	0.41	0.08	0.77	0.52	0.18		0.52	0.42	0.10	
Avail Cap(c_a), veh/h		1378	4308	1341	376	1514	471		364	559	475	
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Upstream Filter(I)		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Uniform Delay (d), s/veh		21.9	11.6	10.0	25.7	16.3	14.5		25.7	22.6	21.6	
Incr Delay (d2), s/veh		4.4	0.1	0.1	9.8	0.3	0.2		2.2	1.2	0.2	
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln		4.1	3.1	0.5	1.8	3.4	1.0		0.8	1.5	0.3	
LnGrp Delay(d),s/veh		26.3	11.8	10.1	35.5	16.6	14.7		27.9	23.8	21.9	
LnGrp LOS		C	B	B	D	B	B		C	C	C	
Approach Vol, veh/h			1158			969				218		
Approach Delay, s/veh			14.9			18.3				25.5		
Approach LOS			B			B				C		

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.9	11.1	7.9	27.2	7.1	13.9	14.2	20.9
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	7.0	17.0	12.0	48.0	6.0	18.0	44.0	16.0
Max Q Clear Time (g_c+I1), s	5.9	4.8	5.0	8.7	3.6	7.9	9.7	9.3
Green Ext Time (p_c), s	0.1	2.2	0.1	14.5	0.1	2.0	0.7	5.0

Intersection Summary	
HCM 2010 Ctrl Delay	18.9
HCM 2010 LOS	B

Notes

User approved ignoring U-Turning movement.

Movement	SBL	SBT	SBR
Lane Configurations			
Volume (veh/h)	234	194	155
Number	1	6	16
Initial Q (Qb), veh	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900
Adj Flow Rate, veh/h	246	204	163
Adj No. of Lanes	2	2	0
Peak Hour Factor	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3
Cap, veh/h	357	334	254
Arrive On Green	0.10	0.18	0.18
Sat Flow, veh/h	3408	1900	1443
Grp Volume(v), veh/h	246	187	180
Grp Sat Flow(s),veh/h/ln	1704	1752	1590
Q Serve(g_s), s	3.9	5.5	5.9
Cycle Q Clear(g_c), s	3.9	5.5	5.9
Prop In Lane	1.00		0.91
Lane Grp Cap(c), veh/h	357	308	280
V/C Ratio(X)	0.69	0.61	0.64
Avail Cap(c_a), veh/h	425	562	510
HCM Platoon Ratio	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.2	21.3	21.5
Incr Delay (d2), s/veh	3.7	1.9	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	2.8	2.8
LnGrp Delay(d),s/veh	27.9	23.3	23.9
LnGrp LOS	C	C	C
Approach Vol, veh/h		613	
Approach Delay, s/veh		25.3	
Approach LOS		C	

Timer

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	24	589	1141	94	55	7
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1845	1900	1845	1845
Adj Flow Rate, veh/h	26	640	1240	102	60	8
Adj No. of Lanes	1	2	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	42	2793	2281	187	85	76
Arrive On Green	0.02	0.80	0.70	0.70	0.05	0.05
Sat Flow, veh/h	1757	3597	3373	269	1757	1568
Grp Volume(v), veh/h	26	640	661	681	60	8
Grp Sat Flow(s),veh/h/ln	1757	1752	1752	1797	1757	1568
Q Serve(g_s), s	0.8	2.3	9.5	9.6	1.7	0.3
Cycle Q Clear(g_c), s	0.8	2.3	9.5	9.6	1.7	0.3
Prop In Lane	1.00			0.15	1.00	1.00
Lane Grp Cap(c), veh/h	42	2793	1219	1250	85	76
V/C Ratio(X)	0.61	0.23	0.54	0.54	0.71	0.11
Avail Cap(c_a), veh/h	238	5224	2239	2296	510	455
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.0	1.3	3.9	3.9	24.2	23.5
Incr Delay (d2), s/veh	13.5	0.0	0.4	0.4	10.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	1.1	4.5	4.7	1.1	0.2
LnGrp Delay(d),s/veh	38.5	1.3	4.2	4.2	34.5	24.1
LnGrp LOS	D	A	A	A	C	C
Approach Vol, veh/h		666	1342		68	
Approach Delay, s/veh		2.8	4.2		33.3	
Approach LOS		A	A		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				45.2		6.5	5.2	39.9
Change Period (Y+Rc), s				4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s				77.0		15.0	7.0	66.0
Max Q Clear Time (g_c+I1), s				4.3		3.7	2.8	11.6
Green Ext Time (p_c), s				26.7		0.1	0.0	24.3

Intersection Summary			
HCM 2010 Ctrl Delay			4.7
HCM 2010 LOS			A

HCM 2010 Signalized Intersection Summary
1: Hillcrest Ave & SR4 Ramps

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	655	650	817	124
Number			5	2	6	16
Initial Q (Qb), veh			0	0	0	0
Ped-Bike Adj(A_pbT)			1.00			1.00
Parking Bus, Adj			1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln			1845	1845	1845	1900
Adj Flow Rate, veh/h			712	707	888	0
Adj No. of Lanes			2	1	2	0
Peak Hour Factor			0.92	0.92	0.92	0.92
Percent Heavy Veh, %			3	3	3	3
Cap, veh/h			987	1687	1891	0
Arrive On Green			0.29	0.91	0.54	0.00
Sat Flow, veh/h			3408	1845	3689	0
Grp Volume(v), veh/h			712	707	888	0
Grp Sat Flow(s),veh/h/ln			1704	1845	1752	0
Q Serve(g_s), s			8.8	2.5	7.3	0.0
Cycle Q Clear(g_c), s			8.8	2.5	7.3	0.0
Prop In Lane			1.00			0.00
Lane Grp Cap(c), veh/h			987	1687	1891	0
V/C Ratio(X)			0.72	0.42	0.47	0.00
Avail Cap(c_a), veh/h			2841	3785	3970	0
HCM Platoon Ratio			1.00	1.00	1.00	1.00
Upstream Filter(I)			1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh			14.9	0.3	6.6	0.0
Incr Delay (d2), s/veh			1.0	0.2	0.2	0.0
Initial Q Delay(d3),s/veh			0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln			4.2	1.1	3.5	0.0
LnGrp Delay(d),s/veh			15.9	0.4	6.8	0.0
LnGrp LOS			B	A	A	
Approach Vol, veh/h				1419	888	
Approach Delay, s/veh				8.2	6.8	
Approach LOS				A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		
Phs Duration (G+Y+Rc), s		46.8			17.5	29.2		
Change Period (Y+Rc), s		4.0			4.0	4.0		
Max Green Setting (Gmax), s		96.0			39.0	53.0		
Max Q Clear Time (g_c+I1), s		4.5			10.8	9.3		
Green Ext Time (p_c), s		18.1			2.8	15.9		

Intersection Summary			
HCM 2010 Ctrl Delay			7.7
HCM 2010 LOS			A

HCM 2010 Signalized Intersection Summary
2: Hillcrest Ave & SR 4 Ramps

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	142	1	687	0	0	0	0	1161	395	168	637	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1845				0	1845	1900	1845	1845	0
Adj Flow Rate, veh/h	154	1	747				0	1262	429	183	692	0
Adj No. of Lanes	0	1	2				0	3	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	510	3	807				0	1666	565	221	2167	0
Arrive On Green	0.29	0.29	0.29				0.00	0.45	0.45	0.13	0.62	0.00
Sat Flow, veh/h	1746	11	2760				0	3885	1261	1757	3597	0
Grp Volume(v), veh/h	155	0	747				0	1139	552	183	692	0
Grp Sat Flow(s),veh/h/ln	1757	0	1380				0	1679	1622	1757	1752	0
Q Serve(g_s), s	6.1	0.0	23.5				0.0	25.4	25.5	9.1	8.4	0.0
Cycle Q Clear(g_c), s	6.1	0.0	23.5				0.0	25.4	25.5	9.1	8.4	0.0
Prop In Lane	0.99		1.00				0.00		0.78	1.00		0.00
Lane Grp Cap(c), veh/h	514	0	807				0	1504	727	221	2167	0
V/C Ratio(X)	0.30	0.00	0.93				0.00	0.76	0.76	0.83	0.32	0.00
Avail Cap(c_a), veh/h	530	0	832				0	1611	779	353	2543	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.6	0.0	30.8				0.0	20.6	20.7	38.2	8.1	0.0
Incr Delay (d2), s/veh	0.3	0.0	15.9				0.0	2.0	4.1	8.7	0.1	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
%ile BackOfQ(50%),veh/ln	3.0	0.0	10.7				0.0	12.1	12.2	5.0	4.1	0.0
LnGrp Delay(d),s/veh	24.9	0.0	46.6				0.0	22.6	24.8	47.0	8.2	0.0
LnGrp LOS	C		D					C	C	D	A	
Approach Vol, veh/h		902						1691			875	
Approach Delay, s/veh		42.9						23.3			16.3	
Approach LOS		D						C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	15.2	44.1		30.2		59.4		
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		
Max Green Setting (Gmax), s	18.0	43.0		27.0		65.0		
Max Q Clear Time (g_c+I1), s	11.1	27.5		25.5		10.4		
Green Ext Time (p_c), s	0.3	12.6		0.7		31.2		

Intersection Summary			
HCM 2010 Ctrl Delay			26.6
HCM 2010 LOS			C

HCM 2010 Signalized Intersection Summary
3: Hillcrest Ave & Laurel Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	79	59	55	174	40	196	64	334	142	183	328	86
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1845	1845	1900	1845	1845	1845	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	86	64	60	189	43	133	70	363	0	199	357	93
Adj No. of Lanes	1	1	0	1	1	1	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	501	258	242	468	542	461	93	954	0	263	1018	262
Arrive On Green	0.29	0.29	0.29	0.29	0.29	0.29	0.05	0.27	0.00	0.15	0.37	0.37
Sat Flow, veh/h	1192	877	822	1250	1845	1568	1757	3597	0	1757	2761	710
Grp Volume(v), veh/h	86	0	124	189	43	133	70	363	0	199	225	225
Grp Sat Flow(s),veh/h/ln	1192	0	1700	1250	1845	1568	1757	1752	0	1757	1752	1719
Q Serve(g_s), s	2.4	0.0	2.3	5.7	0.7	2.8	1.7	3.5	0.0	4.6	3.9	4.0
Cycle Q Clear(g_c), s	3.1	0.0	2.3	8.1	0.7	2.8	1.7	3.5	0.0	4.6	3.9	4.0
Prop In Lane	1.00		0.48	1.00		1.00	1.00		0.00	1.00		0.41
Lane Grp Cap(c), veh/h	501	0	499	468	542	461	93	954	0	263	646	634
V/C Ratio(X)	0.17	0.00	0.25	0.40	0.08	0.29	0.75	0.38	0.00	0.76	0.35	0.36
Avail Cap(c_a), veh/h	998	0	1208	989	1311	1115	708	3322	0	749	1702	1670
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.9	0.0	11.4	14.4	10.8	11.5	19.7	12.5	0.0	17.2	9.6	9.7
Incr Delay (d2), s/veh	0.2	0.0	0.3	0.6	0.1	0.3	11.4	0.3	0.0	4.4	0.3	0.3
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(50%),veh/ln	0.8	0.0	1.1	2.0	0.4	1.2	1.1	1.7	0.0	2.5	1.9	1.9
LnGrp Delay(d),s/veh	12.0	0.0	11.6	15.0	10.8	11.8	31.1	12.7	0.0	21.6	10.0	10.0
LnGrp LOS	B		B	B	B	B	C	B		C	A	B
Approach Vol, veh/h		210			365			433			649	
Approach Delay, s/veh		11.8			13.4			15.7			13.6	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.3	15.5		16.4	6.2	19.6		16.4
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	18.0	40.0		30.0	17.0	41.0		30.0
Max Q Clear Time (g_c+I1), s	6.6	5.5		5.1	3.7	6.0		10.1
Green Ext Time (p_c), s	0.4	5.9		2.4	0.1	6.0		2.3

Intersection Summary	
HCM 2010 Ctrl Delay	13.8
HCM 2010 LOS	B

HCM 2010 Signalized Intersection Summary
4: Canada Valley Road & Laurel Road

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	483	66	194	510	113	240
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1900	1845	1845	1845	1845
Adj Flow Rate, veh/h	525	72	211	554	123	131
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	1206	165	284	2293	246	219
Arrive On Green	0.39	0.39	0.16	0.65	0.14	0.14
Sat Flow, veh/h	3191	424	1757	3597	1757	1568
Grp Volume(v), veh/h	296	301	211	554	123	131
Grp Sat Flow(s),veh/h/ln	1752	1770	1757	1752	1757	1568
Q Serve(g_s), s	4.8	4.9	4.4	2.5	2.5	3.0
Cycle Q Clear(g_c), s	4.8	4.9	4.4	2.5	2.5	3.0
Prop In Lane		0.24	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	682	689	284	2293	246	219
V/C Ratio(X)	0.43	0.44	0.74	0.24	0.50	0.60
Avail Cap(c_a), veh/h	1399	1413	1221	5595	1357	1211
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.7	8.7	15.5	2.8	15.4	15.7
Incr Delay (d2), s/veh	0.4	0.4	3.8	0.1	1.6	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	2.4	2.4	1.2	1.3	1.4
LnGrp Delay(d),s/veh	9.2	9.2	19.3	2.8	17.0	18.3
LnGrp LOS	A	A	B	A	B	B
Approach Vol, veh/h	597			765	254	
Approach Delay, s/veh	9.2			7.4	17.7	
Approach LOS	A			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		9.4	10.3	19.1				29.4
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		30.0	27.0	31.0				62.0
Max Q Clear Time (g_c+I1), s		5.0	6.4	6.9				4.5
Green Ext Time (p_c), s		0.8	0.6	8.3				9.9

Intersection Summary	
HCM 2010 Ctrl Delay	9.6
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	732	85	0	623	487	0	0	0	450	1	168
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1900	0	1845	1900				1845	1845	1845
Adj Flow Rate, veh/h	0	796	92	0	677	0				490	0	183
Adj No. of Lanes	0	2	0	0	2	0				2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	0	3	3				3	3	3
Cap, veh/h	0	1812	209	0	2005	0				821	0	366
Arrive On Green	0.00	0.57	0.57	0.00	0.57	0.00				0.23	0.00	0.23
Sat Flow, veh/h	0	3259	366	0	3689	0				3514	0	1568
Grp Volume(v), veh/h	0	440	448	0	677	0				490	0	183
Grp Sat Flow(s),veh/h/ln	0	1752	1780	0	1752	0				1757	0	1568
Q Serve(g_s), s	0.0	5.9	5.9	0.0	4.2	0.0				5.1	0.0	4.2
Cycle Q Clear(g_c), s	0.0	5.9	5.9	0.0	4.2	0.0				5.1	0.0	4.2
Prop In Lane	0.00		0.21	0.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1003	1018	0	2005	0				821	0	366
V/C Ratio(X)	0.00	0.44	0.44	0.00	0.34	0.00				0.60	0.00	0.50
Avail Cap(c_a), veh/h	0	2469	2508	0	4937	0				2901	0	1295
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	5.0	5.0	0.0	4.7	0.0				14.1	0.0	13.7
Incr Delay (d2), s/veh	0.0	0.3	0.3	0.0	0.1	0.0				0.7	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.9	2.9	0.0	2.0	0.0				2.5	0.0	1.9
LnGrp Delay(d),s/veh	0.0	5.3	5.3	0.0	4.8	0.0				14.8	0.0	14.7
LnGrp LOS		A	A		A					B		B
Approach Vol, veh/h		888			677						673	
Approach Delay, s/veh		5.3			4.8						14.8	
Approach LOS		A			A						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				27.6		13.6		27.6
Change Period (Y+Rc), s				4.0		4.0		4.0
Max Green Setting (Gmax), s				58.0		34.0		58.0
Max Q Clear Time (g_c+I1), s				7.9		7.1		6.2
Green Ext Time (p_c), s				15.6		2.5		15.8

Intersection Summary	
HCM 2010 Ctrl Delay	8.0
HCM 2010 LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	251	931	0	0	1096	725	29	0	318	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	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			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1845	1845	0	0	1845	1845	1900	1845	1845			
Adj Flow Rate, veh/h	273	1012	0	0	1191	0	32	0	346			
Adj No. of Lanes	1	2	0	0	2	1	0	1	1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	315	2300	0	0	1506	674	437	0	390			
Arrive On Green	0.18	0.66	0.00	0.00	0.43	0.00	0.25	0.00	0.25			
Sat Flow, veh/h	1757	3597	0	0	3597	1568	1757	0	1568			
Grp Volume(v), veh/h	273	1012	0	0	1191	0	32	0	346			
Grp Sat Flow(s),veh/h/ln	1757	1752	0	0	1752	1568	1757	0	1568			
Q Serve(g_s), s	12.7	11.7	0.0	0.0	24.7	0.0	1.2	0.0	17.9			
Cycle Q Clear(g_c), s	12.7	11.7	0.0	0.0	24.7	0.0	1.2	0.0	17.9			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	315	2300	0	0	1506	674	437	0	390			
V/C Ratio(X)	0.87	0.44	0.00	0.00	0.79	0.00	0.07	0.00	0.89			
Avail Cap(c_a), veh/h	417	2582	0	0	1582	708	626	0	559			
HCM Platoon Ratio	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	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	33.6	7.0	0.0	0.0	20.7	0.0	24.2	0.0	30.5			
Incr Delay (d2), s/veh	13.9	0.1	0.0	0.0	2.7	0.0	0.1	0.0	11.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	7.4	5.7	0.0	0.0	12.5	0.0	0.6	0.0	9.0			
LnGrp Delay(d),s/veh	47.5	7.1	0.0	0.0	23.4	0.0	24.3	0.0	42.3			
LnGrp LOS	D	A			C		C		D			
Approach Vol, veh/h		1285			1191			378				
Approach Delay, s/veh		15.7			23.4			40.8				
Approach LOS		B			C			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		24.9		59.2			19.1	40.2
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		30.0		62.0			20.0	38.0
Max Q Clear Time (g_c+I1), s		19.9		13.7			14.7	26.7
Green Ext Time (p_c), s		1.0		28.0			0.4	9.5

Intersection Summary	
HCM 2010 Ctrl Delay	22.3
HCM 2010 LOS	C

HCM 2010 Signalized Intersection Summary
7: SR 4 EB On-ramps/SR 4 EB Off-Ramps & Lone Tree Way

10/26/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	790	434	95	1182	0	0	0	0	318	1	393
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1845	1845	1845	0				1845	1845	1845
Adj Flow Rate, veh/h	0	859	472	103	1285	0				347	0	427
Adj No. of Lanes	0	3	1	2	3	0				2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	2276	709	174	2824	0				1139	0	508
Arrive On Green	0.00	0.45	0.45	0.05	0.56	0.00				0.32	0.00	0.32
Sat Flow, veh/h	0	5202	1568	3408	5202	0				3514	0	1568
Grp Volume(v), veh/h	0	859	472	103	1285	0				347	0	427
Grp Sat Flow(s),veh/h/ln	0	1679	1568	1704	1679	0				1757	0	1568
Q Serve(g_s), s	0.0	7.8	16.4	2.1	10.5	0.0				5.2	0.0	17.6
Cycle Q Clear(g_c), s	0.0	7.8	16.4	2.1	10.5	0.0				5.2	0.0	17.6
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2276	709	174	2824	0				1139	0	508
V/C Ratio(X)	0.00	0.38	0.67	0.59	0.46	0.00				0.30	0.00	0.84
Avail Cap(c_a), veh/h	0	2462	766	343	3258	0				2374	0	1059
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	12.6	14.9	32.3	9.0	0.0				17.6	0.0	21.8
Incr Delay (d2), s/veh	0.0	0.1	2.0	3.2	0.1	0.0				0.1	0.0	3.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.6	7.5	1.0	4.8	0.0				2.5	0.0	8.1
LnGrp Delay(d),s/veh	0.0	12.7	16.9	35.4	9.1	0.0				17.8	0.0	25.6
LnGrp LOS		B	B	D	A					B		C
Approach Vol, veh/h		1331			1388						774	
Approach Delay, s/veh		14.2			11.1						22.1	
Approach LOS		B			B						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			7.6	35.4		26.6		43.0
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			7.0	34.0		47.0		45.0
Max Q Clear Time (g_c+I1), s			4.1	18.4		19.6		12.5
Green Ext Time (p_c), s			0.1	13.0		3.0		23.5

Intersection Summary	
HCM 2010 Ctrl Delay	14.7
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

HCM 2010 Signalized Intersection Summary
8: Jefferey Way /SR 4 EB On-Ramps & Lone Tree Way

10/26/2015

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (veh/h)	0	962	166	8	3	852	311	429	19	138	0	0
Number	7	4	14		3	8	18	5	2	12		
Initial Q (Qb), veh	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		
Parking Bus, Adj	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	0	1845	1845		1845	1845	1845	1845	1845	1845		
Adj Flow Rate, veh/h	0	1046	90		3	926	338	481	0	147		
Adj No. of Lanes	0	3	1		1	3	1	2	0	1		
Peak Hour Factor	0.92	0.92	0.92		0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	0	3	3		3	3	3	3	3	3		
Cap, veh/h	0	2776	864		6	3188	993	737	0	329		
Arrive On Green	0.00	0.55	0.55		0.00	0.63	0.63	0.21	0.00	0.21		
Sat Flow, veh/h	0	5202	1568		1757	5036	1568	3514	0	1568		
Grp Volume(v), veh/h	0	1046	90		3	926	338	481	0	147		
Grp Sat Flow(s),veh/h/ln	0	1679	1568		1757	1679	1568	1757	0	1568		
Q Serve(g_s), s	0.0	6.0	1.4		0.1	4.2	5.1	6.4	0.0	4.2		
Cycle Q Clear(g_c), s	0.0	6.0	1.4		0.1	4.2	5.1	6.4	0.0	4.2		
Prop In Lane	0.00		1.00		1.00		1.00	1.00		1.00		
Lane Grp Cap(c), veh/h	0	2776	864		6	3188	993	737	0	329		
V/C Ratio(X)	0.00	0.38	0.10		0.52	0.29	0.34	0.65	0.00	0.45		
Avail Cap(c_a), veh/h	0	4152	1293		207	5141	1601	2759	0	1231		
HCM Platoon Ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	0.00	1.00	1.00		1.00	1.00	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	0.0	6.5	5.4		25.3	4.2	4.4	18.4	0.0	17.5		
Incr Delay (d2), s/veh	0.0	0.1	0.1		58.5	0.0	0.2	1.0	0.0	1.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	0.0	2.7	0.6		0.1	1.9	2.2	3.2	0.0	1.9		
LnGrp Delay(d),s/veh	0.0	6.6	5.5		83.8	4.3	4.6	19.4	0.0	18.5		
LnGrp LOS		A	A		F	A	A	B		B		
Approach Vol, veh/h		1136				1267			628			
Approach Delay, s/veh		6.5				4.5			19.2			
Approach LOS		A				A			B			

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		14.7	4.2	32.1				36.2
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		40.0	6.0	42.0				52.0
Max Q Clear Time (g_c+I1), s		8.4	2.1	8.0				7.1
Green Ext Time (p_c), s		2.3	0.0	20.1				23.3

Intersection Summary	
HCM 2010 Ctrl Delay	8.3
HCM 2010 LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Movement	SBR
Lane Configurations	
Volume (veh/h)	0
Number	
Initial Q (Qb), veh	
Ped-Bike Adj(A_pbT)	
Parking Bus, Adj	
Adj Sat Flow, veh/h/ln	
Adj Flow Rate, veh/h	
Adj No. of Lanes	
Peak Hour Factor	
Percent Heavy Veh, %	
Cap, veh/h	
Arrive On Green	
Sat Flow, veh/h	
Grp Volume(v), veh/h	
Grp Sat Flow(s),veh/h/ln	
Q Serve(g_s), s	
Cycle Q Clear(g_c), s	
Prop In Lane	
Lane Grp Cap(c), veh/h	
V/C Ratio(X)	
Avail Cap(c_a), veh/h	
HCM Platoon Ratio	
Upstream Filter(I)	
Uniform Delay (d), s/veh	
Incr Delay (d2), s/veh	
Initial Q Delay(d3),s/veh	
%ile BackOfQ(50%),veh/ln	
LnGrp Delay(d),s/veh	
LnGrp LOS	
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer	

User approved ignoring U-Turning movement.

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Volume (veh/h)	43	131	476	41	61	612	92	15	107	88	47	25
Number		7	4	14	3	8	18		5	2	12	
Initial Q (Qb), veh		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	
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Adj Sat Flow, veh/h/ln		1845	1845	1845	1845	1845	1845		1845	1845	1845	
Adj Flow Rate, veh/h		142	517	23	66	665	52		116	96	26	
Adj No. of Lanes		1	3	1	1	3	1		2	1	1	
Peak Hour Factor		0.92	0.92	0.92	0.92	0.92	0.92		0.92	0.92	0.92	
Percent Heavy Veh, %		3	3	3	3	3	3		3	3	3	
Cap, veh/h		190	1859	579	87	1566	488		230	295	251	
Arrive On Green		0.11	0.37	0.37	0.05	0.31	0.31		0.07	0.16	0.16	
Sat Flow, veh/h		1757	5036	1568	1757	5036	1568		3408	1845	1568	
Grp Volume(v), veh/h		142	517	23	66	665	52		116	96	26	
Grp Sat Flow(s),veh/h/ln		1757	1679	1568	1757	1679	1568		1704	1845	1568	
Q Serve(g_s), s		3.6	3.3	0.4	1.7	4.8	1.1		1.5	2.1	0.6	
Cycle Q Clear(g_c), s		3.6	3.3	0.4	1.7	4.8	1.1		1.5	2.1	0.6	
Prop In Lane		1.00		1.00	1.00		1.00		1.00		1.00	
Lane Grp Cap(c), veh/h		190	1859	579	87	1566	488		230	295	251	
V/C Ratio(X)		0.75	0.28	0.04	0.76	0.42	0.11		0.50	0.32	0.10	
Avail Cap(c_a), veh/h		961	4189	1304	462	2756	858		746	888	755	
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Upstream Filter(I)		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Uniform Delay (d), s/veh		19.8	10.1	9.2	21.4	12.5	11.2		20.6	17.0	16.4	
Incr Delay (d2), s/veh		5.8	0.1	0.0	12.4	0.2	0.1		1.7	0.6	0.2	
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln		2.0	1.5	0.2	1.1	2.2	0.5		0.8	1.1	0.3	
LnGrp Delay(d),s/veh		25.6	10.2	9.3	33.9	12.7	11.3		22.3	17.6	16.6	
LnGrp LOS		C	B	A	C	B	B		C	B	B	
Approach Vol, veh/h			682			783				238		
Approach Delay, s/veh			13.4			14.4				19.8		
Approach LOS			B			B				B		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.2	11.3	6.3	20.9	7.1	11.5	8.9	18.2				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	12.0	22.0	12.0	38.0	10.0	24.0	25.0	25.0				
Max Q Clear Time (g_c+I1), s	3.7	4.1	3.7	5.3	3.5	5.5	5.6	6.8				
Green Ext Time (p_c), s	0.2	2.0	0.1	9.2	0.2	2.0	0.3	7.4				
Intersection Summary												
HCM 2010 Ctrl Delay			15.7									
HCM 2010 LOS			B									
Notes												

User approved ignoring U-Turning movement.

HCM 2010 Signalized Intersection Summary
9: Empire Avenue & Lone Tree Way

Movement	SBL	SBT	SBR
Lane Configurations			
Volume (veh/h)	120	126	119
Number	1	6	16
Initial Q (Qb), veh	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900
Adj Flow Rate, veh/h	130	137	129
Adj No. of Lanes	2	2	0
Peak Hour Factor	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3
Cap, veh/h	241	291	253
Arrive On Green	0.07	0.16	0.16
Sat Flow, veh/h	3408	1778	1546
Grp Volume(v), veh/h	130	135	131
Grp Sat Flow(s),veh/h/ln	1704	1752	1572
Q Serve(g_s), s	1.7	3.2	3.5
Cycle Q Clear(g_c), s	1.7	3.2	3.5
Prop In Lane	1.00		0.98
Lane Grp Cap(c), veh/h	241	286	257
V/C Ratio(X)	0.54	0.47	0.51
Avail Cap(c_a), veh/h	895	921	826
HCM Platoon Ratio	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.5	17.3	17.4
Incr Delay (d2), s/veh	1.9	1.2	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	1.6	1.6
LnGrp Delay(d),s/veh	22.4	18.5	19.0
LnGrp LOS	C	B	B
Approach Vol, veh/h		396	
Approach Delay, s/veh		19.9	
Approach LOS		B	

Timer

HCM 2010 Signalized Intersection Summary
10: Laurel Road & Country Hills Road

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	9	714	690	27	79	11
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1845	1900	1845	1845
Adj Flow Rate, veh/h	10	776	750	29	86	12
Adj No. of Lanes	1	2	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	19	2495	2035	79	121	108
Arrive On Green	0.01	0.71	0.59	0.59	0.07	0.07
Sat Flow, veh/h	1757	3597	3533	133	1757	1568
Grp Volume(v), veh/h	10	776	382	397	86	12
Grp Sat Flow(s),veh/h/ln	1757	1752	1752	1821	1757	1568
Q Serve(g_s), s	0.2	3.0	4.2	4.2	1.7	0.3
Cycle Q Clear(g_c), s	0.2	3.0	4.2	4.2	1.7	0.3
Prop In Lane	1.00			0.07	1.00	1.00
Lane Grp Cap(c), veh/h	19	2495	1037	1077	121	108
V/C Ratio(X)	0.54	0.31	0.37	0.37	0.71	0.11
Avail Cap(c_a), veh/h	385	6530	2689	2795	1155	1031
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.0	1.9	3.9	3.9	16.6	15.9
Incr Delay (d2), s/veh	22.1	0.1	0.2	0.2	7.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.4	2.0	2.0	1.1	0.2
LnGrp Delay(d),s/veh	40.1	2.0	4.1	4.1	24.0	16.4
LnGrp LOS	D	A	A	A	C	B
Approach Vol, veh/h		786	779		98	
Approach Delay, s/veh		2.5	4.1		23.1	
Approach LOS		A	A		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				30.0		6.5	4.4	25.6
Change Period (Y+Rc), s				4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s				68.0		24.0	8.0	56.0
Max Q Clear Time (g_c+I1), s				5.0		3.7	2.2	6.2
Green Ext Time (p_c), s				16.1		0.2	0.0	15.4

Intersection Summary	
HCM 2010 Ctrl Delay	4.5
HCM 2010 LOS	A

HCM 2010 Signalized Intersection Summary
1: Hillcrest Ave & SR4 WB Ramps

10/26/2015

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	648	558	880	141
Number			5	2	6	16
Initial Q (Qb), veh			0	0	0	0
Ped-Bike Adj(A_pbT)			1.00			1.00
Parking Bus, Adj			1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln			1845	1845	1845	1900
Adj Flow Rate, veh/h			704	607	957	0
Adj No. of Lanes			2	1	2	0
Peak Hour Factor			0.92	0.92	0.92	0.92
Percent Heavy Veh, %			3	3	3	3
Cap, veh/h			976	1687	1904	0
Arrive On Green			0.29	0.91	0.54	0.00
Sat Flow, veh/h			3408	1845	3689	0
Grp Volume(v), veh/h			704	607	957	0
Grp Sat Flow(s),veh/h/ln			1704	1845	1752	0
Q Serve(g_s), s			8.7	2.0	8.0	0.0
Cycle Q Clear(g_c), s			8.7	2.0	8.0	0.0
Prop In Lane			1.00			0.00
Lane Grp Cap(c), veh/h			976	1687	1904	0
V/C Ratio(X)			0.72	0.36	0.50	0.00
Avail Cap(c_a), veh/h			2690	3777	4112	0
HCM Platoon Ratio			1.00	1.00	1.00	1.00
Upstream Filter(I)			1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh			15.1	0.3	6.7	0.0
Incr Delay (d2), s/veh			1.0	0.1	0.2	0.0
Initial Q Delay(d3),s/veh			0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln			4.1	0.9	3.9	0.0
LnGrp Delay(d),s/veh			16.1	0.4	6.9	0.0
LnGrp LOS			B	A	A	
Approach Vol, veh/h				1311	957	
Approach Delay, s/veh				8.8	6.9	
Approach LOS				A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		
Phs Duration (G+Y+Rc), s		46.9			17.4	29.5		
Change Period (Y+Rc), s		4.0			4.0	4.0		
Max Green Setting (Gmax), s		96.0			37.0	55.0		
Max Q Clear Time (g_c+I1), s		4.0			10.7	10.0		
Green Ext Time (p_c), s		17.2			2.7	15.4		

Intersection Summary		
HCM 2010 Ctrl Delay		8.0
HCM 2010 LOS		A

HCM 2010 Signalized Intersection Summary
2: Hillcrest Ave & SR 4 EB Ramps

10/26/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	122	0	730	0	0	0	0	1086	398	182	692	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1845				0	1845	1900	1845	1845	0
Adj Flow Rate, veh/h	128	0	768				0	1143	419	192	728	0
Adj No. of Lanes	0	1	2				0	3	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	533	0	837				0	1558	571	231	2123	0
Arrive On Green	0.30	0.00	0.30				0.00	0.43	0.43	0.13	0.61	0.00
Sat Flow, veh/h	1757	0	2760				0	3801	1332	1757	3597	0
Grp Volume(v), veh/h	128	0	768				0	1056	506	192	728	0
Grp Sat Flow(s),veh/h/ln	1757	0	1380				0	1679	1610	1757	1752	0
Q Serve(g_s), s	4.8	0.0	23.6				0.0	23.0	23.0	9.4	9.1	0.0
Cycle Q Clear(g_c), s	4.8	0.0	23.6				0.0	23.0	23.0	9.4	9.1	0.0
Prop In Lane	1.00		1.00				0.00		0.83	1.00		0.00
Lane Grp Cap(c), veh/h	533	0	837				0	1439	690	231	2123	0
V/C Ratio(X)	0.24	0.00	0.92				0.00	0.73	0.73	0.83	0.34	0.00
Avail Cap(c_a), veh/h	560	0	880				0	1567	751	380	2553	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.0	0.0	29.5				0.0	20.9	20.9	37.2	8.6	0.0
Incr Delay (d2), s/veh	0.2	0.0	14.0				0.0	1.7	3.4	7.8	0.1	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
%ile BackOfQ(50%),veh/ln	2.4	0.0	10.6				0.0	10.9	10.8	5.0	4.4	0.0
LnGrp Delay(d),s/veh	23.2	0.0	43.5				0.0	22.6	24.3	45.0	8.7	0.0
LnGrp LOS	C		D					C	C	D	A	
Approach Vol, veh/h		896						1562			920	
Approach Delay, s/veh		40.6						23.1			16.3	
Approach LOS		D						C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	15.6	41.7		30.6		57.2		
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		
Max Green Setting (Gmax), s	19.0	41.0		28.0		64.0		
Max Q Clear Time (g_c+I1), s	11.4	25.0		25.6		11.1		
Green Ext Time (p_c), s	0.3	12.6		1.0		28.8		

Intersection Summary		
HCM 2010 Ctrl Delay		25.9
HCM 2010 LOS		C

HCM 2010 Signalized Intersection Summary
3: Hillcrest Ave & Laurel Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	27	15	21	229	138	131	27	375	119	189	458	38
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1845	1845	1900	1845	1845	1845	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	28	16	22	241	145	79	28	395	0	199	482	40
Adj No. of Lanes	1	1	0	1	1	1	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	405	189	260	510	495	421	47	1041	0	266	1383	114
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.03	0.30	0.00	0.15	0.42	0.42
Sat Flow, veh/h	1141	705	969	1351	1845	1568	1757	3597	0	1757	3278	271
Grp Volume(v), veh/h	28	0	38	241	145	79	28	395	0	199	257	265
Grp Sat Flow(s),veh/h/ln	1141	0	1674	1351	1845	1568	1757	1752	0	1757	1752	1797
Q Serve(g_s), s	0.8	0.0	0.7	6.9	2.6	1.6	0.7	3.8	0.0	4.6	4.2	4.2
Cycle Q Clear(g_c), s	3.5	0.0	0.7	7.6	2.6	1.6	0.7	3.8	0.0	4.6	4.2	4.2
Prop In Lane	1.00		0.58	1.00		1.00	1.00		0.00	1.00		0.15
Lane Grp Cap(c), veh/h	405	0	449	510	495	421	47	1041	0	266	740	758
V/C Ratio(X)	0.07	0.00	0.08	0.47	0.29	0.19	0.60	0.38	0.00	0.75	0.35	0.35
Avail Cap(c_a), veh/h	690	0	868	848	957	813	414	3306	0	1077	2314	2373
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.7	0.0	11.6	14.5	12.3	11.9	20.4	11.8	0.0	17.2	8.3	8.3
Incr Delay (d2), s/veh	0.1	0.0	0.1	0.7	0.3	0.2	11.8	0.2	0.0	4.2	0.3	0.3
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(50%),veh/ln	0.3	0.0	0.3	2.6	1.4	0.7	0.5	1.8	0.0	2.5	2.1	2.1
LnGrp Delay(d),s/veh	13.8	0.0	11.7	15.1	12.6	12.2	32.2	12.0	0.0	21.4	8.6	8.6
LnGrp LOS	B		B	B	B	B	C	B		C	A	A
Approach Vol, veh/h		66			465			423			721	
Approach Delay, s/veh		12.6			13.9			13.4			12.1	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.4	16.6		15.4	5.1	21.9		15.4
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	26.0	40.0		22.0	10.0	56.0		22.0
Max Q Clear Time (g_c+I1), s	6.6	5.8		5.5	2.7	6.2		9.6
Green Ext Time (p_c), s	0.5	6.8		2.0	0.0	7.1		1.8

Intersection Summary		
HCM 2010 Ctrl Delay	12.9	
HCM 2010 LOS	B	

HCM 2010 Signalized Intersection Summary
4: Canada Valley Road & Laurel Road

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	423	48	203	600	102	219
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1900	1845	1845	1845	1845
Adj Flow Rate, veh/h	460	52	221	652	111	120
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	1223	138	298	2312	229	204
Arrive On Green	0.39	0.39	0.17	0.66	0.13	0.13
Sat Flow, veh/h	3269	358	1757	3597	1757	1568
Grp Volume(v), veh/h	253	259	221	652	111	120
Grp Sat Flow(s),veh/h/ln	1752	1782	1757	1752	1757	1568
Q Serve(g_s), s	3.9	4.0	4.5	3.0	2.2	2.7
Cycle Q Clear(g_c), s	3.9	4.0	4.5	3.0	2.2	2.7
Prop In Lane		0.20	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	675	686	298	2312	229	204
V/C Ratio(X)	0.37	0.38	0.74	0.28	0.49	0.59
Avail Cap(c_a), veh/h	1473	1498	1200	5710	1385	1236
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.4	8.4	15.0	2.7	15.4	15.6
Incr Delay (d2), s/veh	0.3	0.3	3.7	0.1	1.6	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	2.0	2.5	1.4	1.2	1.3
LnGrp Delay(d),s/veh	8.8	8.8	18.7	2.8	17.0	18.3
LnGrp LOS	A	A	B	A	B	B
Approach Vol, veh/h	512			873	231	
Approach Delay, s/veh	8.8			6.8	17.6	
Approach LOS	A			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		9.0	10.4	18.7				29.1
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		30.0	26.0	32.0				62.0
Max Q Clear Time (g_c+I1), s		4.7	6.5	6.0				5.0
Green Ext Time (p_c), s		0.7	0.6	8.7				10.2

Intersection Summary		
HCM 2010 Ctrl Delay	9.0	
HCM 2010 LOS	A	

HCM 2010 Signalized Intersection Summary
5: SR 4 EB On-Ramps/SR 4 EB Off-Ramps & Laurel Road

10/26/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	625	49	0	969	360	0	0	0	896	2	444
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1900	0	1845	1900				1845	1845	1845
Adj Flow Rate, veh/h	0	679	53	0	1053	0				975	0	483
Adj No. of Lanes	0	2	0	0	2	0				2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	0	3	3				3	3	3
Cap, veh/h	0	1619	126	0	1722	0				1375	0	614
Arrive On Green	0.00	0.49	0.49	0.00	0.49	0.00				0.39	0.00	0.39
Sat Flow, veh/h	0	3387	257	0	3689	0				3514	0	1568
Grp Volume(v), veh/h	0	361	371	0	1053	0				975	0	483
Grp Sat Flow(s),veh/h/ln	0	1752	1799	0	1752	0				1757	0	1568
Q Serve(g_s), s	0.0	9.0	9.0	0.0	14.9	0.0				16.0	0.0	18.5
Cycle Q Clear(g_c), s	0.0	9.0	9.0	0.0	14.9	0.0				16.0	0.0	18.5
Prop In Lane	0.00		0.14	0.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	861	884	0	1722	0				1375	0	614
V/C Ratio(X)	0.00	0.42	0.42	0.00	0.61	0.00				0.71	0.00	0.79
Avail Cap(c_a), veh/h	0	1284	1318	0	2568	0				2162	0	965
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	11.1	11.1	0.0	12.6	0.0				17.5	0.0	18.3
Incr Delay (d2), s/veh	0.0	0.3	0.3	0.0	0.4	0.0				0.7	0.0	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.4	4.5	0.0	7.3	0.0				7.8	0.0	8.3
LnGrp Delay(d),s/veh	0.0	11.4	11.4	0.0	13.0	0.0				18.2	0.0	20.6
LnGrp LOS		B	B		B					B		C
Approach Vol, veh/h		732			1053						1458	
Approach Delay, s/veh		11.4			13.0						19.0	
Approach LOS		B			B						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				37.5		30.7		37.5
Change Period (Y+Rc), s				4.0		4.0		4.0
Max Green Setting (Gmax), s				50.0		42.0		50.0
Max Q Clear Time (g_c+I1), s				11.0		20.5		16.9
Green Ext Time (p_c), s				17.9		6.2		16.6

Intersection Summary	
HCM 2010 Ctrl Delay	15.3
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

HCM 2010 Signalized Intersection Summary
6: SR 4 WB Off-Ramps/SR 4 WB On-Ramps & Laurel Road

10/26/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	114	1406	0	0	1276	465	140	0	497	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	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			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1845	1845	0	0	1845	1845	1900	1845	1845			
Adj Flow Rate, veh/h	124	1528	0	0	1387	0	152	0	540			
Adj No. of Lanes	1	2	0	0	2	1	0	1	1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	146	1924	0	0	1488	666	646	0	577			
Arrive On Green	0.08	0.55	0.00	0.00	0.42	0.00	0.37	0.00	0.37			
Sat Flow, veh/h	1757	3597	0	0	3597	1568	1757	0	1568			
Grp Volume(v), veh/h	124	1528	0	0	1387	0	152	0	540			
Grp Sat Flow(s),veh/h/ln	1757	1752	0	0	1752	1568	1757	0	1568			
Q Serve(g_s), s	6.7	33.6	0.0	0.0	36.3	0.0	5.8	0.0	32.0			
Cycle Q Clear(g_c), s	6.7	33.6	0.0	0.0	36.3	0.0	5.8	0.0	32.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	146	1924	0	0	1488	666	646	0	577			
V/C Ratio(X)	0.85	0.79	0.00	0.00	0.93	0.00	0.24	0.00	0.94			
Avail Cap(c_a), veh/h	146	1927	0	0	1491	667	711	0	634			
HCM Platoon Ratio	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	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	43.6	17.4	0.0	0.0	26.4	0.0	21.1	0.0	29.4			
Incr Delay (d2), s/veh	35.3	2.4	0.0	0.0	10.9	0.0	0.2	0.0	20.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.7	16.8	0.0	0.0	19.8	0.0	2.8	0.0	17.1			
LnGrp Delay(d),s/veh	78.9	19.7	0.0	0.0	37.3	0.0	21.3	0.0	49.8			
LnGrp LOS	E	B			D		C		D			
Approach Vol, veh/h		1652			1387			692				
Approach Delay, s/veh		24.2			37.3			43.6				
Approach LOS		C			D			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		39.5		56.9			12.0	44.9
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		39.0		53.0			8.0	41.0
Max Q Clear Time (g_c+I1), s		34.0		35.6			8.7	38.3
Green Ext Time (p_c), s		1.5		15.9			0.0	2.6

Intersection Summary	
HCM 2010 Ctrl Delay	32.7
HCM 2010 LOS	C

7: SR 4 EB On-ramps/SR 4 EB Off-Ramps & Lone Tree Way

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1420	497	120	1391	0	0	0	0	461	2	374
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1845	1845	1845	0				1845	1845	1845
Adj Flow Rate, veh/h	0	1495	523	126	1464	0				486	0	394
Adj No. of Lanes	0	3	1	2	3	0				2	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	2469	769	200	3017	0				1056	0	471
Arrive On Green	0.00	0.49	0.49	0.06	0.60	0.00				0.30	0.00	0.30
Sat Flow, veh/h	0	5202	1568	3408	5202	0				3514	0	1568
Grp Volume(v), veh/h	0	1495	523	126	1464	0				486	0	394
Grp Sat Flow(s),veh/h/ln	0	1679	1568	1704	1679	0				1757	0	1568
Q Serve(g_s), s	0.0	17.1	20.3	2.9	13.1	0.0				8.9	0.0	18.7
Cycle Q Clear(g_c), s	0.0	17.1	20.3	2.9	13.1	0.0				8.9	0.0	18.7
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2469	769	200	3017	0				1056	0	471
V/C Ratio(X)	0.00	0.61	0.68	0.63	0.49	0.00				0.46	0.00	0.84
Avail Cap(c_a), veh/h	0	2529	788	342	3288	0				1765	0	788
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	14.7	15.5	36.6	9.0	0.0				22.6	0.0	26.0
Incr Delay (d2), s/veh	0.0	0.4	2.3	3.3	0.1	0.0				0.3	0.0	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.0	9.2	1.4	6.0	0.0				4.4	0.0	8.6
LnGrp Delay(d),s/veh	0.0	15.1	17.8	39.9	9.1	0.0				22.9	0.0	30.0
LnGrp LOS		B	B	D	A					C		C
Approach Vol, veh/h		2018			1590						880	
Approach Delay, s/veh		15.8			11.6						26.1	
Approach LOS		B			B						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			8.7	43.0		27.9		51.7
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			8.0	40.0		40.0		52.0
Max Q Clear Time (g_c+I1), s			4.9	22.3		20.7		15.1
Green Ext Time (p_c), s			0.1	16.6		3.2		32.6

Intersection Summary	
HCM 2010 Ctrl Delay	16.3
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

8: Jefferey Way /SR 4 WB On-Ramps & Lone Tree Way

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (veh/h)	0	1616	285	20	5	990	384	539	29	189	0	0
Number	7	4	14		3	8	18	5	2	12		
Initial Q (Qb), veh	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		
Parking Bus, Adj	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	0	1845	1845		1845	1845	1845	1845	1845	1845		
Adj Flow Rate, veh/h	0	1701	153		5	1042	404	589	0	197		
Adj No. of Lanes	0	3	1		1	3	1	2	0	1		
Peak Hour Factor	0.95	0.95	0.95		0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	0	3	3		3	3	3	3	3	3		
Cap, veh/h	0	3027	943		9	3338	1039	788	0	352		
Arrive On Green	0.00	0.60	0.60		0.01	0.66	0.66	0.22	0.00	0.22		
Sat Flow, veh/h	0	5202	1568		1757	5036	1568	3514	0	1568		
Grp Volume(v), veh/h	0	1701	153		5	1042	404	589	0	197		
Grp Sat Flow(s),veh/h/ln	0	1679	1568		1757	1679	1568	1757	0	1568		
Q Serve(g_s), s	0.0	14.4	3.1		0.2	6.2	8.3	11.1	0.0	7.9		
Cycle Q Clear(g_c), s	0.0	14.4	3.1		0.2	6.2	8.3	11.1	0.0	7.9		
Prop In Lane	0.00		1.00		1.00		1.00	1.00		1.00		
Lane Grp Cap(c), veh/h	0	3027	943		9	3338	1039	788	0	352		
V/C Ratio(X)	0.00	0.56	0.16		0.54	0.31	0.39	0.75	0.00	0.56		
Avail Cap(c_a), veh/h	0	3408	1061		149	4117	1282	1684	0	752		
HCM Platoon Ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	0.00	1.00	1.00		1.00	1.00	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	0.0	8.5	6.3		35.2	5.1	5.4	25.6	0.0	24.4		
Incr Delay (d2), s/veh	0.0	0.2	0.1		40.7	0.1	0.2	1.4	0.0	1.4		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	0.0	6.7	1.3		0.2	2.9	3.5	5.5	0.0	3.5		
LnGrp Delay(d),s/veh	0.0	8.7	6.3		75.9	5.1	5.7	27.1	0.0	25.8		
LnGrp LOS		A	A		E	A	A	C		C		
Approach Vol, veh/h		1854				1451			786			
Approach Delay, s/veh		8.5				5.5			26.8			
Approach LOS		A				A			C			

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		19.9	4.4	46.6				51.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		34.0	6.0	48.0				58.0
Max Q Clear Time (g_c+I1), s		13.1	2.2	16.4				10.3
Green Ext Time (p_c), s		2.8	0.0	26.2				36.5

Intersection Summary	
HCM 2010 Ctrl Delay	10.9
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

HCM 2010 Signalized Intersection Summary
8: Jefferey Way /SR 4 WB On-Ramps & Lone Tree Way

10/26/2015

Movement	SBR
Lane Configurations	
Volume (veh/h)	0
Number	
Initial Q (Qb), veh	
Ped-Bike Adj(A_pbT)	
Parking Bus, Adj	
Adj Sat Flow, veh/h/ln	
Adj Flow Rate, veh/h	
Adj No. of Lanes	
Peak Hour Factor	
Percent Heavy Veh, %	
Cap, veh/h	
Arrive On Green	
Sat Flow, veh/h	
Grp Volume(v), veh/h	
Grp Sat Flow(s),veh/h/ln	
Q Serve(g_s), s	
Cycle Q Clear(g_c), s	
Prop In Lane	
Lane Grp Cap(c), veh/h	
V/C Ratio(X)	
Avail Cap(c_a), veh/h	
HCM Platoon Ratio	
Upstream Filter(I)	
Uniform Delay (d), s/veh	
Incr Delay (d2), s/veh	
Initial Q Delay(d3),s/veh	
%ile BackOfQ(50%),veh/ln	
LnGrp Delay(d),s/veh	
LnGrp LOS	
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	

Timer	

User approved ignoring U-Turning movement.

HCM 2010 Signalized Intersection Summary
9: Empire Avenue & Lone Tree Way

10/26/2015

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Volume (veh/h)	101	240	815	95	90	757	157	16	94	94	37	59
Number		7	4	14	3	8	18		5	2	12	
Initial Q (Qb), veh		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	
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Adj Sat Flow, veh/h/ln		1845	1845	1845	1845	1845	1845		1845	1845	1845	
Adj Flow Rate, veh/h		253	858	58	95	797	112		99	99	22	
Adj No. of Lanes		1	3	1	1	3	1		2	1	1	
Peak Hour Factor		0.95	0.95	0.95	0.95	0.95	0.95		0.95	0.95	0.95	
Percent Heavy Veh, %		3	3	3	3	3	3		3	3	3	
Cap, veh/h		318	2076	646	123	1517	472		189	236	201	
Arrive On Green		0.18	0.41	0.41	0.07	0.30	0.30		0.06	0.13	0.13	
Sat Flow, veh/h		1757	5036	1568	1757	5036	1568		3408	1845	1568	
Grp Volume(v), veh/h		253	858	58	95	797	112		99	99	22	
Grp Sat Flow(s),veh/h/ln		1757	1679	1568	1757	1679	1568		1704	1845	1568	
Q Serve(g_s), s		7.9	6.9	1.3	3.0	7.5	3.1		1.6	2.8	0.7	
Cycle Q Clear(g_c), s		7.9	6.9	1.3	3.0	7.5	3.1		1.6	2.8	0.7	
Prop In Lane		1.00		1.00	1.00		1.00		1.00		1.00	
Lane Grp Cap(c), veh/h		318	2076	646	123	1517	472		189	236	201	
V/C Ratio(X)		0.80	0.41	0.09	0.77	0.53	0.24		0.52	0.42	0.11	
Avail Cap(c_a), veh/h		950	3515	1094	368	1845	575		416	579	492	
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Upstream Filter(I)		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Uniform Delay (d), s/veh		22.5	11.9	10.3	26.2	16.6	15.1		26.3	23.0	22.1	
Incr Delay (d2), s/veh		4.5	0.1	0.1	9.8	0.3	0.3		2.3	1.2	0.2	
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln		4.2	3.2	0.6	1.8	3.5	1.4		0.8	1.5	0.3	
LnGrp Delay(d),s/veh		27.0	12.1	10.3	36.0	16.9	15.3		28.6	24.2	22.3	
LnGrp LOS		C	B	B	D	B	B		C	C	C	
Approach Vol, veh/h			1169			1004				220		
Approach Delay, s/veh			15.2			18.5				26.0		
Approach LOS			B			B				C		

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	11.3	8.0	27.6	7.2	14.5	14.4	21.3
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	14.0	18.0	12.0	40.0	7.0	25.0	31.0	21.0
Max Q Clear Time (g_c+I1), s	6.0	4.8	5.0	8.9	3.6	8.0	9.9	9.5
Green Ext Time (p_c), s	0.5	2.3	0.1	14.3	0.1	2.5	0.7	7.7

Intersection Summary	
HCM 2010 Ctrl Delay	19.0
HCM 2010 LOS	B

Notes

User approved ignoring U-Turning movement.

HCM 2010 Signalized Intersection Summary
9: Empire Avenue & Lone Tree Way

Movement	SBL	SBT	SBR
Lane Configurations			
Volume (veh/h)	234	194	155
Number	1	6	16
Initial Q (Qb), veh	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900
Adj Flow Rate, veh/h	246	204	163
Adj No. of Lanes	2	2	0
Peak Hour Factor	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3
Cap, veh/h	377	348	264
Arrive On Green	0.11	0.18	0.18
Sat Flow, veh/h	3408	1900	1443
Grp Volume(v), veh/h	246	187	180
Grp Sat Flow(s),veh/h/ln	1704	1752	1590
Q Serve(g_s), s	4.0	5.6	6.0
Cycle Q Clear(g_c), s	4.0	5.6	6.0
Prop In Lane	1.00		0.91
Lane Grp Cap(c), veh/h	377	321	291
V/C Ratio(X)	0.65	0.58	0.62
Avail Cap(c_a), veh/h	833	764	694
HCM Platoon Ratio	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.4	21.4	21.5
Incr Delay (d2), s/veh	1.9	1.7	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	2.9	2.8
LnGrp Delay(d),s/veh	26.4	23.1	23.7
LnGrp LOS	C	C	C
Approach Vol, veh/h		613	
Approach Delay, s/veh		24.6	
Approach LOS		C	

Timer			

HCM 2010 Signalized Intersection Summary
10: Laurel Road & Country Hills Road

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	24	619	1191	94	55	7
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1845	1900	1845	1845
Adj Flow Rate, veh/h	26	673	1295	102	60	8
Adj No. of Lanes	1	2	2	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	42	2822	2330	183	83	74
Arrive On Green	0.02	0.81	0.71	0.71	0.05	0.05
Sat Flow, veh/h	1757	3597	3385	259	1757	1568
Grp Volume(v), veh/h	26	673	688	709	60	8
Grp Sat Flow(s),veh/h/ln	1757	1752	1752	1799	1757	1568
Q Serve(g_s), s	0.8	2.5	10.2	10.3	1.8	0.3
Cycle Q Clear(g_c), s	0.8	2.5	10.2	10.3	1.8	0.3
Prop In Lane	1.00			0.14	1.00	1.00
Lane Grp Cap(c), veh/h	42	2822	1240	1273	83	74
V/C Ratio(X)	0.62	0.24	0.55	0.56	0.72	0.11
Avail Cap(c_a), veh/h	227	4974	2132	2188	486	433
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.2	1.3	3.8	3.8	25.5	24.8
Incr Delay (d2), s/veh	13.9	0.0	0.4	0.4	11.2	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	1.1	4.9	5.1	1.1	0.2
LnGrp Delay(d),s/veh	40.2	1.3	4.2	4.2	36.7	25.4
LnGrp LOS	D	A	A	A	D	C
Approach Vol, veh/h		699	1397		68	
Approach Delay, s/veh		2.8	4.2		35.4	
Approach LOS		A	A		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				47.7		6.6	5.3	42.4
Change Period (Y+Rc), s				4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s				77.0		15.0	7.0	66.0
Max Q Clear Time (g_c+I1), s				4.5		3.8	2.8	12.3
Green Ext Time (p_c), s				29.2		0.1	0.0	26.1

Intersection Summary	
HCM 2010 Ctrl Delay	4.7
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	32	0	137	0	0	0	0	1806	503	294	569	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1845				0	1845	1900	1845	1845	0
Adj Flow Rate, veh/h	35	0	149				0	1963	547	320	618	0
Adj No. of Lanes	2	0	2				0	3	0	2	2	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	259	0	231				0	2636	702	406	2915	0
Arrive On Green	0.07	0.00	0.07				0.00	0.67	0.67	0.12	0.83	0.00
Sat Flow, veh/h	3514	0	3136				0	4127	1055	3408	3597	0
Grp Volume(v), veh/h	35	0	149				0	1650	860	320	618	0
Grp Sat Flow(s),veh/h/ln	1757	0	1568				0	1679	1659	1704	1752	0
Q Serve(g_s), s	0.8	0.0	3.9				0.0	27.4	30.5	7.7	3.0	0.0
Cycle Q Clear(g_c), s	0.8	0.0	3.9				0.0	27.4	30.5	7.7	3.0	0.0
Prop In Lane	1.00		1.00				0.00		0.64	1.00		0.00
Lane Grp Cap(c), veh/h	259	0	231				0	2234	1104	406	2915	0
V/C Ratio(X)	0.14	0.00	0.64				0.00	0.74	0.78	0.79	0.21	0.00
Avail Cap(c_a), veh/h	664	0	593				0	2339	1156	523	3146	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	36.7	0.0	38.1				0.0	9.3	9.8	36.3	1.5	0.0
Incr Delay (d2), s/veh	0.2	0.0	3.0				0.0	1.2	3.3	6.1	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
%ile BackOfQ(50%),veh/ln	0.4	0.0	1.8				0.0	12.8	14.6	4.0	1.5	0.0
LnGrp Delay(d),s/veh	36.9	0.0	41.1				0.0	10.5	13.2	42.3	1.5	0.0
LnGrp LOS	D		D					B	B	D	A	
Approach Vol, veh/h		184						2510			938	
Approach Delay, s/veh		40.3						11.4			15.4	
Approach LOS		D						B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	14.1	60.3		10.2		74.4		
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		
Max Green Setting (Gmax), s	13.0	59.0		16.0		76.0		
Max Q Clear Time (g_c+I1), s	9.7	32.5		5.9		5.0		
Green Ext Time (p_c), s	0.4	23.8		0.4		54.9		

Intersection Summary		
HCM 2010 Ctrl Delay		13.9
HCM 2010 LOS		B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	121	90	85	366	80	252	98	1191	531	436	1094	145
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1845	1845	1900	1845	1845	1845	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	132	98	92	398	87	138	107	1295	0	474	1189	158
Adj No. of Lanes	1	1	0	1	1	1	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	354	248	232	299	521	443	134	1419	0	337	1619	214
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.08	0.40	0.00	0.19	0.52	0.52
Sat Flow, veh/h	1140	877	823	1177	1845	1568	1757	3597	0	1757	3112	412
Grp Volume(v), veh/h	132	0	190	398	87	138	107	1295	0	474	668	679
Grp Sat Flow(s),veh/h/ln	1140	0	1699	1177	1845	1568	1757	1752	0	1757	1752	1772
Q Serve(g_s), s	9.8	0.0	9.0	19.0	3.5	6.9	5.9	34.6	0.0	19.0	29.3	29.6
Cycle Q Clear(g_c), s	13.3	0.0	9.0	28.0	3.5	6.9	5.9	34.6	0.0	19.0	29.3	29.6
Prop In Lane	1.00		0.48	1.00		1.00	1.00		0.00	1.00		0.23
Lane Grp Cap(c), veh/h	354	0	480	299	521	443	134	1419	0	337	912	922
V/C Ratio(X)	0.37	0.00	0.40	1.33	0.17	0.31	0.80	0.91	0.00	1.41	0.73	0.74
Avail Cap(c_a), veh/h	354	0	480	299	521	443	160	1450	0	337	912	922
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.8	0.0	28.7	42.4	26.8	28.0	45.0	27.8	0.0	40.1	18.4	18.5
Incr Delay (d2), s/veh	0.7	0.0	0.5	170.6	0.1	0.4	21.1	9.0	0.0	200.3	3.1	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	4.3	22.3	1.8	3.0	3.7	18.3	0.0	27.9	14.9	15.1
LnGrp Delay(d),s/veh	32.4	0.0	29.3	212.9	26.9	28.4	66.2	36.9	0.0	240.3	21.5	21.6
LnGrp LOS	C		C	F	C	C	E	D		F	C	C
Approach Vol, veh/h		322			623			1402			1821	
Approach Delay, s/veh		30.6			146.1			39.1			78.5	
Approach LOS		C			F			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	23.0	44.1		32.0	11.5	55.6		32.0
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	19.0	41.0		28.0	9.0	51.0		28.0
Max Q Clear Time (g_c+I1), s	21.0	36.6		15.3	7.9	31.6		30.0
Green Ext Time (p_c), s	0.0	3.5		3.7	0.0	16.6		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		71.6
HCM 2010 LOS		E

HCM 2010 Signalized Intersection Summary
4: Canada Valley Road & Laurel Road

10/27/2015

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1041	117	314	782	154	369
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1900	1845	1845	1845	1845
Adj Flow Rate, veh/h	1132	127	341	850	167	201
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	1488	167	389	2594	280	250
Arrive On Green	0.47	0.47	0.22	0.74	0.16	0.16
Sat Flow, veh/h	3271	356	1757	3597	1757	1568
Grp Volume(v), veh/h	623	636	341	850	167	201
Grp Sat Flow(s),veh/h/ln	1752	1782	1757	1752	1757	1568
Q Serve(g_s), s	23.3	23.4	14.9	6.6	7.0	9.8
Cycle Q Clear(g_c), s	23.3	23.4	14.9	6.6	7.0	9.8
Prop In Lane		0.20	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	820	834	389	2594	280	250
V/C Ratio(X)	0.76	0.76	0.88	0.33	0.60	0.81
Avail Cap(c_a), veh/h	904	920	575	3133	464	415
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.4	17.5	29.9	3.5	31.0	32.2
Incr Delay (d2), s/veh	3.4	3.5	10.0	0.1	2.0	6.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.0	12.3	8.3	3.2	3.5	4.6
LnGrp Delay(d),s/veh	20.9	20.9	39.9	3.6	33.1	38.2
LnGrp LOS	C	C	D	A	C	D
Approach Vol, veh/h	1259			1191	368	
Approach Delay, s/veh	20.9			14.0	35.9	
Approach LOS	C			B	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		16.6	21.6	41.2				62.8
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		21.0	26.0	41.0				71.0
Max Q Clear Time (g_c+I1), s		11.8	16.9	25.4				8.6
Green Ext Time (p_c), s		0.8	0.7	11.8				27.5

Intersection Summary	
HCM 2010 Ctrl Delay	19.9
HCM 2010 LOS	B

HCM 2010 Signalized Intersection Summary
5: SR 4 EB On-Ramps/SR 4 EB Off-Ramps & Laurel Road

10/27/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1363	122	0	575	100	0	0	0	830	0	342
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1900	0	1845	1900				1845	1845	1845
Adj Flow Rate, veh/h	0	1482	133	0	625	0				902	0	372
Adj No. of Lanes	0	2	0	0	2	0				2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	0	3	3				3	3	3
Cap, veh/h	0	1888	168	0	2033	0				1129	0	504
Arrive On Green	0.00	0.58	0.58	0.00	0.58	0.00				0.32	0.00	0.32
Sat Flow, veh/h	0	3348	290	0	3689	0				3514	0	1568
Grp Volume(v), veh/h	0	793	822	0	625	0				902	0	372
Grp Sat Flow(s),veh/h/ln	0	1752	1793	0	1752	0				1757	0	1568
Q Serve(g_s), s	0.0	28.2	28.8	0.0	7.4	0.0				19.0	0.0	17.1
Cycle Q Clear(g_c), s	0.0	28.2	28.8	0.0	7.4	0.0				19.0	0.0	17.1
Prop In Lane	0.00		0.16	0.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1016	1040	0	2033	0				1129	0	504
V/C Ratio(X)	0.00	0.78	0.79	0.00	0.31	0.00				0.80	0.00	0.74
Avail Cap(c_a), veh/h	0	1124	1150	0	2248	0				1733	0	774
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	13.1	13.2	0.0	8.7	0.0				25.1	0.0	24.5
Incr Delay (d2), s/veh	0.0	3.3	3.5	0.0	0.1	0.0				1.5	0.0	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	14.4	15.2	0.0	3.6	0.0				9.4	0.0	7.6
LnGrp Delay(d),s/veh	0.0	16.4	16.7	0.0	8.8	0.0				26.7	0.0	26.6
LnGrp LOS		B	B		A					C		C
Approach Vol, veh/h		1615			625						1274	
Approach Delay, s/veh		16.5			8.8						26.6	
Approach LOS		B			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				51.0		30.1		51.0
Change Period (Y+Rc), s				4.0		4.0		4.0
Max Green Setting (Gmax), s				52.0		40.0		52.0
Max Q Clear Time (g_c+I1), s				30.8		21.0		9.4
Green Ext Time (p_c), s				16.2		5.1		26.6

Intersection Summary	
HCM 2010 Ctrl Delay	18.8
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

HCM 2010 Signalized Intersection Summary
6: SR 4 WB Off-Ramps/SR 4 WB On-Ramps & Laurel Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	654	1475	0	0	728	310	38	0	109	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	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			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1845	1845	0	0	1845	1845	1900	1845	1845			
Adj Flow Rate, veh/h	711	1603	0	0	791	0	41	0	118			
Adj No. of Lanes	1	2	0	0	2	1	0	1	1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	766	2806	0	0	1103	494	175	0	156			
Arrive On Green	0.44	0.80	0.00	0.00	0.31	0.00	0.10	0.00	0.10			
Sat Flow, veh/h	1757	3597	0	0	3597	1568	1757	0	1568			
Grp Volume(v), veh/h	711	1603	0	0	791	0	41	0	118			
Grp Sat Flow(s),veh/h/ln	1757	1752	0	0	1752	1568	1757	0	1568			
Q Serve(g_s), s	30.7	13.5	0.0	0.0	16.0	0.0	1.7	0.0	5.9			
Cycle Q Clear(g_c), s	30.7	13.5	0.0	0.0	16.0	0.0	1.7	0.0	5.9			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	766	2806	0	0	1103	494	175	0	156			
V/C Ratio(X)	0.93	0.57	0.00	0.00	0.72	0.00	0.23	0.00	0.76			
Avail Cap(c_a), veh/h	987	3281	0	0	1137	509	373	0	333			
HCM Platoon Ratio	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	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	21.4	2.9	0.0	0.0	24.3	0.0	33.3	0.0	35.1			
Incr Delay (d2), s/veh	12.4	0.2	0.0	0.0	2.1	0.0	0.7	0.0	7.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	17.4	6.3	0.0	0.0	8.0	0.0	0.9	0.0	2.8			
LnGrp Delay(d),s/veh	33.8	3.1	0.0	0.0	26.4	0.0	33.9	0.0	42.4			
LnGrp LOS	C	A			C		C		D			
Approach Vol, veh/h		2314			791			159				
Approach Delay, s/veh		12.5			26.4			40.2				
Approach LOS		B			C			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		12.0		68.1			38.9	29.2
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		17.0		75.0			45.0	26.0
Max Q Clear Time (g_c+I1), s		7.9		15.5			32.7	18.0
Green Ext Time (p_c), s		0.3		36.5			2.2	7.2

Intersection Summary			
HCM 2010 Ctrl Delay			17.3
HCM 2010 LOS			B

HCM 2010 Signalized Intersection Summary
7: SR 4 EB On-ramps/SR 4 EB Off-Ramps & Lone Tree Way

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1336	469	242	1648	0	0	0	0	762	12	473
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1845	1845	1845	0				1845	1845	1845
Adj Flow Rate, veh/h	0	1452	510	263	1791	0				837	0	514
Adj No. of Lanes	0	2	2	2	3	0				2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1560	1228	276	2854	0				1238	0	552
Arrive On Green	0.00	0.45	0.45	0.08	0.57	0.00				0.35	0.00	0.35
Sat Flow, veh/h	0	3597	2760	3408	5202	0				3514	0	1568
Grp Volume(v), veh/h	0	1452	510	263	1791	0				837	0	514
Grp Sat Flow(s),veh/h/ln	0	1752	1380	1704	1679	0				1757	0	1568
Q Serve(g_s), s	0.0	38.8	12.4	7.6	23.6	0.0				20.0	0.0	31.2
Cycle Q Clear(g_c), s	0.0	38.8	12.4	7.6	23.6	0.0				20.0	0.0	31.2
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1560	1228	276	2854	0				1238	0	552
V/C Ratio(X)	0.00	0.93	0.42	0.95	0.63	0.00				0.68	0.00	0.93
Avail Cap(c_a), veh/h	0	1562	1230	276	2856	0				1281	0	572
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	26.0	18.6	45.2	14.4	0.0				27.2	0.0	30.8
Incr Delay (d2), s/veh	0.0	10.3	0.2	41.3	0.4	0.0				1.4	0.0	21.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	20.8	4.7	5.1	10.9	0.0				9.9	0.0	16.7
LnGrp Delay(d),s/veh	0.0	36.3	18.9	86.5	14.8	0.0				28.6	0.0	52.5
LnGrp LOS		D	B	F	B					C		D
Approach Vol, veh/h		1962			2054						1351	
Approach Delay, s/veh		31.8			24.0						37.7	
Approach LOS		C			C						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			12.0	48.0		38.8		60.0
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			8.0	44.0		36.0		56.0
Max Q Clear Time (g_c+I1), s			9.6	40.8		33.2		25.6
Green Ext Time (p_c), s			0.0	3.2		1.6		28.5

Intersection Summary			
HCM 2010 Ctrl Delay			30.3
HCM 2010 LOS			C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1483	607	42	1531	356	355	27	322	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	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			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	0	1845	1845	1845	1845	1845	1845	1845	1845			
Adj Flow Rate, veh/h	0	1612	443	46	1664	387	407	0	323			
Adj No. of Lanes	0	3	1	1	3	1	2	0	1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	0	3	3	3	3	3	3	3	3			
Cap, veh/h	0	2959	921	59	3382	1053	797	0	356			
Arrive On Green	0.00	0.59	0.59	0.03	0.67	0.67	0.23	0.00	0.23			
Sat Flow, veh/h	0	5202	1568	1757	5036	1568	3514	0	1568			
Grp Volume(v), veh/h	0	1612	443	46	1664	387	407	0	323			
Grp Sat Flow(s),veh/h/ln	0	1679	1568	1757	1679	1568	1757	0	1568			
Q Serve(g_s), s	0.0	15.3	12.8	2.0	12.8	8.5	8.0	0.0	15.8			
Cycle Q Clear(g_c), s	0.0	15.3	12.8	2.0	12.8	8.5	8.0	0.0	15.8			
Prop In Lane	0.00		1.00	1.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2959	921	59	3382	1053	797	0	356			
V/C Ratio(X)	0.00	0.54	0.48	0.79	0.49	0.37	0.51	0.00	0.91			
Avail Cap(c_a), veh/h	0	2959	921	825	4728	1472	802	0	358			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	9.9	9.3	37.8	6.3	5.6	26.6	0.0	29.7			
Incr Delay (d2), s/veh	0.0	0.2	0.4	20.1	0.1	0.2	0.5	0.0	26.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	7.1	5.6	1.3	5.9	3.7	3.9	0.0	9.4			
LnGrp Delay(d),s/veh	0.0	10.1	9.7	57.9	6.5	5.9	27.2	0.0	55.7			
LnGrp LOS		B	A	E	A	A	C		E			
Approach Vol, veh/h		2055			2097			730				
Approach Delay, s/veh		10.0			7.5			39.8				
Approach LOS		A			A			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		21.9	6.6	50.3				56.9
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		18.0	37.0	33.0				74.0
Max Q Clear Time (g_c+I1), s		17.8	4.0	17.3				14.8
Green Ext Time (p_c), s		0.1	0.1	15.0				38.2

Intersection Summary			
HCM 2010 Ctrl Delay			13.4
HCM 2010 LOS			B

Notes

User approved volume balancing among the lanes for turning movement.

HCM 2010 Signalized Intersection Summary
8: Jefferey Way /SR 4 WB On-Ramps & Lone Tree Way 10/27/2015

User approved ignoring U-Turning movement.

Laurel Ranch Traffic Impact Analysis Synchro 8 Report
AM Cumulative Plus Prj Cond Alt Access 1

9: Empire Avenue & Lone Tree Way

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	120	1095	77	207	1511	144	164	92	128	37	81	87
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1900
Adj Flow Rate, veh/h	130	1190	48	225	1642	117	178	100	114	40	88	95
Adj No. of Lanes	1	3	1	1	3	1	2	1	1	2	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	172	2012	627	279	2320	722	267	292	249	109	196	175
Arrive On Green	0.10	0.40	0.40	0.16	0.46	0.46	0.08	0.16	0.16	0.03	0.11	0.11
Sat Flow, veh/h	1757	5036	1568	1757	5036	1568	3408	1845	1568	3408	1752	1568
Grp Volume(v), veh/h	130	1190	48	225	1642	117	178	100	114	40	88	95
Grp Sat Flow(s),veh/h/ln	1757	1679	1568	1757	1679	1568	1704	1845	1568	1704	1752	1568
Q Serve(g_s), s	4.6	11.8	1.2	7.9	16.6	2.8	3.2	3.1	4.2	0.7	3.0	3.6
Cycle Q Clear(g_c), s	4.6	11.8	1.2	7.9	16.6	2.8	3.2	3.1	4.2	0.7	3.0	3.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	172	2012	627	279	2320	722	267	292	249	109	196	175
V/C Ratio(X)	0.76	0.59	0.08	0.81	0.71	0.16	0.67	0.34	0.46	0.37	0.45	0.54
Avail Cap(c_a), veh/h	1103	3240	1009	579	2320	722	267	521	443	214	467	418
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.0	15.0	11.8	25.9	13.8	10.0	28.5	23.9	24.3	30.2	26.5	26.7
Incr Delay (d2), s/veh	6.6	0.3	0.1	5.4	1.0	0.1	6.1	0.7	1.3	2.1	1.6	2.6
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(50%),veh/ln	2.6	5.5	0.5	4.2	7.8	1.2	1.7	1.6	1.9	0.4	1.5	1.7
LnGrp Delay(d),s/veh	34.6	15.3	11.9	31.3	14.8	10.1	34.7	24.5	25.6	32.3	28.1	29.3
LnGrp LOS	C	B	B	C	B	B	C	C	C	C	C	C
Approach Vol, veh/h		1368			1984			392			223	
Approach Delay, s/veh		17.0			16.4			29.5			29.4	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.0	14.1	14.1	29.5	9.0	11.1	10.2	33.4
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.0	18.0	21.0	41.0	5.0	17.0	40.0	22.0
Max Q Clear Time (g_c+I1), s	2.7	6.2	9.9	13.8	5.2	5.6	6.6	18.6
Green Ext Time (p_c), s	0.0	1.5	0.4	11.6	0.0	1.5	0.3	3.2

Intersection Summary	
HCM 2010 Ctrl Delay	18.6
HCM 2010 LOS	B

Notes

User approved ignoring U-Turning movement.

10: Country Hills Road & Laurel Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	7	905	420	127	843	29	160	0	330	84	0	8
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1845	1845	1900	1845	1845	1900	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	8	984	457	138	916	32	174	0	359	91	0	9
Adj No. of Lanes	1	2	0	2	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	14	1073	489	202	1760	61	207	0	390	115	0	308
Arrive On Green	0.01	0.46	0.46	0.06	0.51	0.51	0.12	0.00	0.25	0.07	0.00	0.20
Sat Flow, veh/h	1757	2341	1068	3408	3455	121	1757	0	1568	1757	0	1568
Grp Volume(v), veh/h	8	732	709	138	465	483	174	0	359	91	0	9
Grp Sat Flow(s),veh/h/ln	1757	1752	1656	1704	1752	1823	1757	0	1568	1757	0	1568
Q Serve(g_s), s	0.4	37.0	38.6	3.8	16.8	16.8	9.2	0.0	21.2	4.9	0.0	0.4
Cycle Q Clear(g_c), s	0.4	37.0	38.6	3.8	16.8	16.8	9.2	0.0	21.2	4.9	0.0	0.4
Prop In Lane	1.00		0.64	1.00		0.07	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	14	803	759	202	893	929	207	0	390	115	0	308
V/C Ratio(X)	0.57	0.91	0.93	0.68	0.52	0.52	0.84	0.00	0.92	0.79	0.00	0.03
Avail Cap(c_a), veh/h	74	829	783	215	893	929	240	0	412	148	0	330
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.0	24.0	24.4	43.9	15.6	15.6	41.1	0.0	34.8	43.8	0.0	30.9
Incr Delay (d2), s/veh	31.3	14.0	17.8	8.0	0.5	0.5	20.5	0.0	25.2	19.2	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(50%),veh/ln	0.3	20.8	21.3	2.0	8.3	8.6	5.7	0.0	11.9	3.0	0.0	0.2
LnGrp Delay(d),s/veh	78.4	38.0	42.2	51.9	16.1	16.1	61.6	0.0	60.0	63.0	0.0	30.9
LnGrp LOS	E	D	D	D	B	B	E		E	E		C
Approach Vol, veh/h		1449			1086			533			100	
Approach Delay, s/veh		40.3			20.7			60.5			60.1	
Approach LOS		D			C			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	27.7	9.6	47.6	15.2	22.7	4.8	52.5
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	8.0	25.0	6.0	45.0	13.0	20.0	4.0	47.0
Max Q Clear Time (g_c+I1), s	6.9	23.2	5.8	40.6	11.2	2.4	2.4	18.8
Green Ext Time (p_c), s	0.0	0.4	0.0	3.0	0.1	2.3	0.0	18.9

Intersection Summary	
HCM 2010 Ctrl Delay	37.6
HCM 2010 LOS	D

HCM 2010 Signalized Intersection Summary
11: Slatten Ranch Road & Laurel Road

10/27/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	188	1071	643	263	785	355	421	208	120	123	180	51
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1845	1845	1845	1845	1845	1900	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	204	1164	356	286	853	386	458	226	130	134	196	55
Adj No. of Lanes	1	3	1	1	3	0	2	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	242	1713	533	327	1320	595	547	412	228	169	339	93
Arrive On Green	0.14	0.34	0.34	0.19	0.39	0.39	0.16	0.19	0.19	0.10	0.12	0.12
Sat Flow, veh/h	1757	5036	1568	1757	3399	1533	3408	2178	1206	1757	2721	744
Grp Volume(v), veh/h	204	1164	356	286	843	396	458	180	176	134	124	127
Grp Sat Flow(s),veh/h/ln	1757	1679	1568	1757	1679	1574	1704	1752	1632	1757	1752	1713
Q Serve(g_s), s	9.6	16.8	16.4	13.4	17.4	17.4	11.0	7.9	8.3	6.3	5.7	5.9
Cycle Q Clear(g_c), s	9.6	16.8	16.4	13.4	17.4	17.4	11.0	7.9	8.3	6.3	5.7	5.9
Prop In Lane	1.00		1.00	1.00		0.97	1.00		0.74	1.00		0.43
Lane Grp Cap(c), veh/h	242	1713	533	327	1303	611	547	331	308	169	218	214
V/C Ratio(X)	0.84	0.68	0.67	0.88	0.65	0.65	0.84	0.54	0.57	0.80	0.57	0.59
Avail Cap(c_a), veh/h	311	1784	555	415	1387	651	644	393	366	311	372	364
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.6	24.0	23.9	33.5	21.2	21.2	34.5	31.0	31.2	37.5	34.9	35.0
Incr Delay (d2), s/veh	15.1	1.0	2.9	15.5	1.0	2.1	8.4	1.4	1.7	8.2	2.3	2.6
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(50%),veh/ln	5.7	7.9	7.5	7.9	8.1	8.0	5.9	3.9	3.9	3.4	2.9	3.0
LnGrp Delay(d),s/veh	50.7	25.0	26.8	49.0	22.1	23.3	42.9	32.4	32.9	45.7	37.3	37.7
LnGrp LOS	D	C	C	D	C	C	D	C	C	D	D	D
Approach Vol, veh/h		1724			1525			814			385	
Approach Delay, s/veh		28.4			27.5			38.4			40.3	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.1	20.0	19.8	32.8	17.6	14.6	15.7	36.9
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	15.0	19.0	20.0	30.0	16.0	18.0	15.0	35.0
Max Q Clear Time (g_c+I1), s	8.3	10.3	15.4	18.8	13.0	7.9	11.6	19.4
Green Ext Time (p_c), s	0.2	2.4	0.4	10.0	0.5	2.6	0.2	13.4

Intersection Summary		
HCM 2010 Ctrl Delay		30.9
HCM 2010 LOS		C

HCM 2010 Signalized Intersection Summary
2: Hillcrest Ave & SR 4 EB Ramps

10/27/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	312	0	1197	0	0	0	0	553	571	328	967	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1845				0	1845	1900	1845	1845	0
Adj Flow Rate, veh/h	328	0	1260				0	582	601	345	1018	0
Adj No. of Lanes	2	0	2				0	3	0	2	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	1601	0	1429				0	966	451	422	1597	0
Arrive On Green	0.46	0.00	0.46				0.00	0.29	0.29	0.12	0.46	0.00
Sat Flow, veh/h	3514	0	3136				0	3523	1568	3408	3597	0
Grp Volume(v), veh/h	328	0	1260				0	582	601	345	1018	0
Grp Sat Flow(s),veh/h/ln	1757	0	1568				0	1679	1568	1704	1752	0
Q Serve(g_s), s	5.1	0.0	33.0				0.0	13.5	26.0	8.9	20.1	0.0
Cycle Q Clear(g_c), s	5.1	0.0	33.0				0.0	13.5	26.0	8.9	20.1	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1601	0	1429				0	966	451	422	1597	0
V/C Ratio(X)	0.20	0.00	0.88				0.00	0.60	1.33	0.82	0.64	0.00
Avail Cap(c_a), veh/h	1905	0	1700				0	966	451	490	1668	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	14.8	0.0	22.4				0.0	27.7	32.2	38.6	18.9	0.0
Incr Delay (d2), s/veh	0.1	0.0	5.1				0.0	1.1	164.1	9.2	0.8	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
%ile BackOfQ(50%),veh/ln	2.5	0.0	15.2				0.0	6.4	31.7	4.8	9.8	0.0
LnGrp Delay(d),s/veh	14.8	0.0	27.5				0.0	28.8	196.3	47.8	19.6	0.0
LnGrp LOS	B		C					C	F	D	B	
Approach Vol, veh/h		1588						1183			1363	
Approach Delay, s/veh		24.9						113.9			26.8	
Approach LOS		C						F			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	15.2	30.0		45.2		45.2		
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		
Max Green Setting (Gmax), s	13.0	26.0		49.0		43.0		
Max Q Clear Time (g_c+I1), s	10.9	28.0		35.0		22.1		
Green Ext Time (p_c), s	0.3	0.0		6.1		15.3		

Intersection Summary		
HCM 2010 Ctrl Delay		51.0
HCM 2010 LOS		D

Notes

User approved volume balancing among the lanes for turning movement.

HCM 2010 Signalized Intersection Summary
3: Hillcrest Ave & Laurel Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	208	115	157	497	307	285	120	1405	418	327	1111	288
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1845	1845	1900	1845	1845	1845	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	219	121	165	523	323	153	126	1479	0	344	1169	303
Adj No. of Lanes	1	1	0	1	1	1	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	297	269	367	344	701	596	123	1332	0	211	1188	305
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.07	0.38	0.00	0.12	0.43	0.43
Sat Flow, veh/h	906	708	966	1078	1845	1568	1757	3597	0	1757	2764	708
Grp Volume(v), veh/h	219	0	286	523	323	153	126	1479	0	344	736	736
Grp Sat Flow(s),veh/h/ln	906	0	1674	1078	1845	1568	1757	1752	0	1757	1752	1720
Q Serve(g_s), s	24.0	0.0	12.8	25.2	13.2	6.7	7.0	38.0	0.0	12.0	41.3	42.6
Cycle Q Clear(g_c), s	37.1	0.0	12.8	38.0	13.2	6.7	7.0	38.0	0.0	12.0	41.3	42.6
Prop In Lane	1.00		0.58	1.00		1.00	1.00		0.00	1.00		0.41
Lane Grp Cap(c), veh/h	297	0	636	344	701	596	123	1332	0	211	754	739
V/C Ratio(X)	0.74	0.00	0.45	1.52	0.46	0.26	1.02	1.11	0.00	1.63	0.98	0.99
Avail Cap(c_a), veh/h	297	0	636	344	701	596	123	1332	0	211	754	739
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.3	0.0	23.2	40.0	23.3	21.3	46.5	31.0	0.0	44.0	28.0	28.4
Incr Delay (d2), s/veh	9.3	0.0	0.5	248.6	0.5	0.2	87.9	60.8	0.0	304.8	27.1	31.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.7	0.0	6.0	33.2	6.7	2.9	6.4	29.6	0.0	23.6	25.5	26.5
LnGrp Delay(d),s/veh	46.5	0.0	23.7	288.6	23.8	21.5	134.7	91.8	0.0	348.8	55.1	60.1
LnGrp LOS	D		C	F	C	C	F	F		F	E	E
Approach Vol, veh/h		505			999			1605			1816	
Approach Delay, s/veh		33.6			162.1			95.2			112.8	
Approach LOS		C			F			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	16.0	42.0		42.0	11.0	47.0		42.0
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0
Max Green Setting (Gmax), s	12.0	38.0		38.0	7.0	43.0		38.0
Max Q Clear Time (g_c+I1), s	14.0	40.0		39.1	9.0	44.6		40.0
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	108.9
HCM 2010 LOS	F

HCM 2010 Signalized Intersection Summary
4: Canada Valley Road & Laurel Road

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	701	216	687	956	66	395
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1900	1845	1845	1845	1845
Adj Flow Rate, veh/h	762	235	747	1039	72	215
Adj No. of Lanes	2	0	1	2	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	752	232	768	2672	274	245
Arrive On Green	0.28	0.28	0.44	0.76	0.16	0.16
Sat Flow, veh/h	2732	814	1757	3597	1757	1568
Grp Volume(v), veh/h	506	491	747	1039	72	215
Grp Sat Flow(s),veh/h/ln	1752	1701	1757	1752	1757	1568
Q Serve(g_s), s	28.0	28.0	41.0	9.8	3.5	13.2
Cycle Q Clear(g_c), s	28.0	28.0	41.0	9.8	3.5	13.2
Prop In Lane		0.48	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	499	484	768	2672	274	245
V/C Ratio(X)	1.01	1.01	0.97	0.39	0.26	0.88
Avail Cap(c_a), veh/h	499	484	768	2673	304	271
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.2	35.2	27.1	3.9	36.5	40.6
Incr Delay (d2), s/veh	43.8	44.4	25.8	0.1	0.5	24.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.5	19.0	25.2	4.7	1.8	7.4
LnGrp Delay(d),s/veh	79.0	79.6	53.0	4.0	37.0	65.2
LnGrp LOS	F	F	D	A	D	E
Approach Vol, veh/h	997			1786	287	
Approach Delay, s/veh	79.3			24.5	58.1	
Approach LOS	E			C	E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		19.4	47.0	32.0				79.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		17.0	43.0	28.0				75.0
Max Q Clear Time (g_c+I1), s		15.2	43.0	30.0				11.8
Green Ext Time (p_c), s		0.2	0.0	0.0				25.9

Intersection Summary	
HCM 2010 Ctrl Delay	45.4
HCM 2010 LOS	D

HCM 2010 Signalized Intersection Summary
5: SR 4 EB On-Ramps/SR 4 EB Off-Ramps & Laurel Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1312	64	0	1192	20	0	0	0	712	0	601
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1900	0	1845	1900				1845	1845	1845
Adj Flow Rate, veh/h	0	1426	70	0	1296	0				774	0	653
Adj No. of Lanes	0	2	0	0	2	0				2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	3	3	0	3	3				3	3	3
Cap, veh/h	0	1570	77	0	1618	0				1596	0	712
Arrive On Green	0.00	0.46	0.46	0.00	0.46	0.00				0.45	0.00	0.45
Sat Flow, veh/h	0	3493	167	0	3689	0				3514	0	1568
Grp Volume(v), veh/h	0	733	763	0	1296	0				774	0	653
Grp Sat Flow(s),veh/h/ln	0	1752	1815	0	1752	0				1757	0	1568
Q Serve(g_s), s	0.0	36.7	37.0	0.0	30.0	0.0				14.6	0.0	36.9
Cycle Q Clear(g_c), s	0.0	36.7	37.0	0.0	30.0	0.0				14.6	0.0	36.9
Prop In Lane	0.00		0.09	0.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	809	838	0	1618	0				1596	0	712
V/C Ratio(X)	0.00	0.91	0.91	0.00	0.80	0.00				0.49	0.00	0.92
Avail Cap(c_a), veh/h	0	813	842	0	1626	0				1779	0	794
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	23.6	23.7	0.0	21.8	0.0				18.1	0.0	24.2
Incr Delay (d2), s/veh	0.0	13.7	13.9	0.0	3.0	0.0				0.2	0.0	14.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	20.8	21.7	0.0	15.1	0.0				7.1	0.0	18.8
LnGrp Delay(d),s/veh	0.0	37.4	37.6	0.0	24.8	0.0				18.3	0.0	38.7
LnGrp LOS		D	D		C					B		D
Approach Vol, veh/h		1496			1296						1427	
Approach Delay, s/veh		37.5			24.8						27.7	
Approach LOS		D			C						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				47.8		47.1		47.8
Change Period (Y+Rc), s				4.0		4.0		4.0
Max Green Setting (Gmax), s				44.0		48.0		44.0
Max Q Clear Time (g_c+I1), s				39.0		38.9		32.0
Green Ext Time (p_c), s				4.7		4.1		11.0

Intersection Summary	
HCM 2010 Ctrl Delay	30.3
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 2010 Signalized Intersection Summary
6: SR 4 WB Off-Ramps/SR 4 WB On-Ramps & Laurel Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	250	1474	0	0	1067	736	209	0	339	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	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			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1845	1845	0	0	1845	1845	1900	1845	1845			
Adj Flow Rate, veh/h	272	1602	0	0	1160	0	227	0	368			
Adj No. of Lanes	1	2	0	0	2	1	0	1	1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	311	2237	0	0	1457	652	475	0	424			
Arrive On Green	0.18	0.64	0.00	0.00	0.42	0.00	0.27	0.00	0.27			
Sat Flow, veh/h	1757	3597	0	0	3597	1568	1757	0	1568			
Grp Volume(v), veh/h	272	1602	0	0	1160	0	227	0	368			
Grp Sat Flow(s),veh/h/ln	1757	1752	0	0	1752	1568	1757	0	1568			
Q Serve(g_s), s	13.2	26.6	0.0	0.0	25.3	0.0	9.5	0.0	19.6			
Cycle Q Clear(g_c), s	13.2	26.6	0.0	0.0	25.3	0.0	9.5	0.0	19.6			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	311	2237	0	0	1457	652	475	0	424			
V/C Ratio(X)	0.88	0.72	0.00	0.00	0.80	0.00	0.48	0.00	0.87			
Avail Cap(c_a), veh/h	382	2406	0	0	1484	664	643	0	574			
HCM Platoon Ratio	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	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	35.0	10.5	0.0	0.0	22.3	0.0	26.7	0.0	30.4			
Incr Delay (d2), s/veh	17.1	1.0	0.0	0.0	3.1	0.0	0.7	0.0	10.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	7.9	13.0	0.0	0.0	12.7	0.0	4.7	0.0	9.7			
LnGrp Delay(d),s/veh	52.2	11.5	0.0	0.0	25.4	0.0	27.5	0.0	40.8			
LnGrp LOS	D	B			C		C		D			
Approach Vol, veh/h		1874			1160			595				
Approach Delay, s/veh		17.4			25.4			35.7				
Approach LOS		B			C			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4			7	8
Phs Duration (G+Y+Rc), s		27.6		59.8			19.5	40.3
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0
Max Green Setting (Gmax), s		32.0		60.0			19.0	37.0
Max Q Clear Time (g_c+I1), s		21.6		28.6			15.2	27.3
Green Ext Time (p_c), s		2.1		26.2			0.3	9.1

Intersection Summary	
HCM 2010 Ctrl Delay	23.0
HCM 2010 LOS	C

HCM 2010 Signalized Intersection Summary
7: SR 4 EB On-ramps/SR 4 EB Off-Ramps & Lone Tree Way

10/27/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1563	851	282	1689	0	0	0	0	928	10	601
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1845	1845	1845	0				1845	1845	1845
Adj Flow Rate, veh/h	0	1645	896	297	1778	0				985	0	633
Adj No. of Lanes	0	2	2	2	3	0				2	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1507	1187	307	2820	0				1265	0	564
Arrive On Green	0.00	0.43	0.43	0.09	0.56	0.00				0.36	0.00	0.36
Sat Flow, veh/h	0	3597	2760	3408	5202	0				3514	0	1568
Grp Volume(v), veh/h	0	1645	896	297	1778	0				985	0	633
Grp Sat Flow(s),veh/h/ln	0	1752	1380	1704	1679	0				1757	0	1568
Q Serve(g_s), s	0.0	43.0	27.4	8.7	24.0	0.0				24.9	0.0	36.0
Cycle Q Clear(g_c), s	0.0	43.0	27.4	8.7	24.0	0.0				24.9	0.0	36.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1507	1187	307	2820	0				1265	0	564
V/C Ratio(X)	0.00	1.09	0.76	0.97	0.63	0.00				0.78	0.00	1.12
Avail Cap(c_a), veh/h	0	1507	1187	307	2820	0				1265	0	564
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	28.5	24.1	45.4	15.0	0.0				28.5	0.0	32.0
Incr Delay (d2), s/veh	0.0	52.4	2.8	42.7	0.5	0.0				3.2	0.0	75.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	31.7	10.8	5.9	11.1	0.0				12.6	0.0	27.4
LnGrp Delay(d),s/veh	0.0	80.9	26.9	88.0	15.4	0.0				31.6	0.0	107.9
LnGrp LOS		F	C	F	B					C		F
Approach Vol, veh/h		2541			2075						1618	
Approach Delay, s/veh		61.8			25.8						61.4	
Approach LOS		E			C						E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4		6		8
Phs Duration (G+Y+Rc), s			13.0	47.0		40.0		60.0
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0
Max Green Setting (Gmax), s			9.0	43.0		36.0		56.0
Max Q Clear Time (g_c+I1), s			10.7	45.0		38.0		26.0
Green Ext Time (p_c), s			0.0	0.0		0.0		29.0

Intersection Summary	
HCM 2010 Ctrl Delay	49.7
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

HCM 2010 Signalized Intersection Summary
8: Jefferey Way /SR 4 WB On-Ramps & Lone Tree Way

10/27/2015

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (veh/h)	0	1997	566	20	38	1411	592	609	32	481	0	0
Number	7	4	14		3	8	18	5	2	12		
Initial Q (Qb), veh	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		
Parking Bus, Adj	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	0	1845	1845		1845	1845	1845	1845	1845	1845		
Adj Flow Rate, veh/h	0	2102	385		40	1485	623	665	0	480		
Adj No. of Lanes	0	3	1		1	3	1	2	0	1		
Peak Hour Factor	0.95	0.95	0.95		0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	0	3	3		3	3	3	3	3	3		
Cap, veh/h	0	2527	787		50	2884	898	1202	0	537		
Arrive On Green	0.00	0.50	0.50		0.03	0.57	0.57	0.34	0.00	0.34		
Sat Flow, veh/h	0	5202	1568		1757	5036	1568	3514	0	1568		
Grp Volume(v), veh/h	0	2102	385		40	1485	623	665	0	480		
Grp Sat Flow(s),veh/h/ln	0	1679	1568		1757	1679	1568	1757	0	1568		
Q Serve(g_s), s	0.0	33.6	15.3		2.1	16.8	26.5	14.4	0.0	27.3		
Cycle Q Clear(g_c), s	0.0	33.6	15.3		2.1	16.8	26.5	14.4	0.0	27.3		
Prop In Lane	0.00		1.00		1.00		1.00	1.00		1.00		
Lane Grp Cap(c), veh/h	0	2527	787		50	2884	898	1202	0	537		
V/C Ratio(X)	0.00	0.83	0.49		0.80	0.51	0.69	0.55	0.00	0.89		
Avail Cap(c_a), veh/h	0	2527	787		75	2945	917	1382	0	617		
HCM Platoon Ratio	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	0.00	1.00	1.00		1.00	1.00	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	0.0	20.0	15.5		45.4	12.2	14.2	25.1	0.0	29.3		
Incr Delay (d2), s/veh	0.0	2.5	0.5		29.4	0.1	2.2	0.4	0.0	14.3		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	0.0	16.0	6.6		1.4	7.7	12.0	7.1	0.0	13.8		
LnGrp Delay(d),s/veh	0.0	22.6	15.9		74.9	12.3	16.5	25.5	0.0	43.6		
LnGrp LOS		C	B		E	B	B	C		D		
Approach Vol, veh/h		2487				2148			1145			
Approach Delay, s/veh		21.5				14.7			33.1			
Approach LOS		C				B			C			

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		36.2	6.7	51.2				57.9
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		37.0	4.0	47.0				55.0
Max Q Clear Time (g_c+I1), s		29.3	4.1	35.6				28.5
Green Ext Time (p_c), s		2.9	0.0	11.2				25.4

Intersection Summary	
HCM 2010 Ctrl Delay	21.3
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	SBR
Lane Configurations	
Volume (veh/h)	0
Number	
Initial Q (Qb), veh	
Ped-Bike Adj(A_pbT)	
Parking Bus, Adj	
Adj Sat Flow, veh/h/ln	
Adj Flow Rate, veh/h	
Adj No. of Lanes	
Peak Hour Factor	
Percent Heavy Veh, %	
Cap, veh/h	
Arrive On Green	
Sat Flow, veh/h	
Grp Volume(v), veh/h	
Grp Sat Flow(s),veh/h/ln	
Q Serve(g_s), s	
Cycle Q Clear(g_c), s	
Prop In Lane	
Lane Grp Cap(c), veh/h	
V/C Ratio(X)	
Avail Cap(c_a), veh/h	
HCM Platoon Ratio	
Upstream Filter(I)	
Uniform Delay (d), s/veh	
Incr Delay (d2), s/veh	
Initial Q Delay(d3),s/veh	
%ile BackOfQ(50%),veh/ln	
LnGrp Delay(d),s/veh	
LnGrp LOS	
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	

Timer

User approved ignoring U-Turning movement.

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Volume (veh/h)	101	273	1726	131	226	1413	180	16	195	97	178	59
Number		7	4	14	3	8	18		5	2	12	
Initial Q (Qb), veh		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	
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Adj Sat Flow, veh/h/ln		1845	1845	1845	1845	1845	1845		1845	1845	1845	
Adj Flow Rate, veh/h		297	1876	120	246	1536	148		212	105	168	
Adj No. of Lanes		1	3	1	1	3	1		2	1	1	
Peak Hour Factor		0.92	0.92	0.92	0.92	0.92	0.92		0.92	0.92	0.92	
Percent Heavy Veh, %		3	3	3	3	3	3		3	3	3	
Cap, veh/h		336	2337	727	284	2188	681		285	295	251	
Arrive On Green		0.19	0.46	0.46	0.16	0.43	0.43		0.08	0.16	0.16	
Sat Flow, veh/h		1757	5036	1568	1757	5036	1568		3408	1845	1568	
Grp Volume(v), veh/h		297	1876	120	246	1536	148		212	105	168	
Grp Sat Flow(s),veh/h/ln		1757	1679	1568	1757	1679	1568		1704	1845	1568	
Q Serve(g_s), s		14.4	27.8	3.9	11.9	21.7	5.2		5.3	4.4	8.8	
Cycle Q Clear(g_c), s		14.4	27.8	3.9	11.9	21.7	5.2		5.3	4.4	8.8	
Prop In Lane		1.00		1.00	1.00		1.00		1.00		1.00	
Lane Grp Cap(c), veh/h		336	2337	727	284	2188	681		285	295	251	
V/C Ratio(X)		0.88	0.80	0.16	0.86	0.70	0.22		0.74	0.36	0.67	
Avail Cap(c_a), veh/h		422	2362	736	362	2190	682		312	443	377	
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Upstream Filter(I)		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Uniform Delay (d), s/veh		34.4	20.0	13.6	35.7	20.1	15.4		39.1	32.7	34.5	
Incr Delay (d2), s/veh		16.5	2.1	0.1	16.0	1.0	0.2		8.5	0.7	3.1	
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln		8.5	13.3	1.7	7.1	10.2	2.3		2.8	2.3	4.0	
LnGrp Delay(d),s/veh		50.8	22.1	13.7	51.7	21.1	15.6		47.6	33.4	37.6	
LnGrp LOS		D	C	B	D	C	B		D	C	D	
Approach Vol, veh/h			2293			1930				485		
Approach Delay, s/veh			25.4			24.6				41.1		
Approach LOS			C			C				D		

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.7	18.0	18.1	44.5	11.3	13.4	20.7	42.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	4.0	21.0	18.0	41.0	8.0	17.0	21.0	38.0
Max Q Clear Time (g_c+I1), s	3.2	10.8	13.9	29.8	7.3	7.7	16.4	23.7
Green Ext Time (p_c), s	0.0	1.8	0.3	10.7	0.0	1.7	0.4	13.6

Intersection Summary		
HCM 2010 Ctrl Delay		27.5
HCM 2010 LOS		C

Notes

User approved ignoring U-Turning movement.

HCM 2010 Signalized Intersection Summary
9: Empire Avenue & Lone Tree Way

10/27/2015

Movement	SBL	SBT	SBR
Lane Configurations			
Volume (veh/h)	43	149	60
Number	1	6	16
Initial Q (Qb), veh	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900
Adj Flow Rate, veh/h	47	162	65
Adj No. of Lanes	2	2	0
Peak Hour Factor	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3
Cap, veh/h	106	266	102
Arrive On Green	0.03	0.11	0.11
Sat Flow, veh/h	3408	2474	955
Grp Volume(v), veh/h	47	113	114
Grp Sat Flow(s),veh/h/ln	1704	1752	1676
Q Serve(g_s), s	1.2	5.4	5.7
Cycle Q Clear(g_c), s	1.2	5.4	5.7
Prop In Lane	1.00		0.57
Lane Grp Cap(c), veh/h	106	188	180
V/C Ratio(X)	0.44	0.60	0.63
Avail Cap(c_a), veh/h	156	341	326
HCM Platoon Ratio	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.6	37.2	37.4
Incr Delay (d2), s/veh	2.9	3.1	3.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	2.8	2.8
LnGrp Delay(d),s/veh	44.5	40.3	41.0
LnGrp LOS	D	D	D
Approach Vol, veh/h		274	
Approach Delay, s/veh		41.3	
Approach LOS		D	
Timer			

HCM 2010 Signalized Intersection Summary
10: Country Hills Road & Laurel Road

10/27/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	18	960	120	402	1371	100	90	0	170	59	0	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1845	1845	1900	1845	1845	1900	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	20	1043	130	437	1490	109	98	0	185	64	0	5
Adj No. of Lanes	1	2	0	2	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	31	1434	179	535	1976	144	125	0	227	82	0	189
Arrive On Green	0.02	0.46	0.46	0.16	0.60	0.60	0.07	0.00	0.15	0.05	0.00	0.12
Sat Flow, veh/h	1757	3137	391	3408	3313	241	1757	0	1568	1757	0	1568
Grp Volume(v), veh/h	20	582	591	437	784	815	98	0	185	64	0	5
Grp Sat Flow(s),veh/h/ln	1757	1752	1776	1704	1752	1802	1757	0	1568	1757	0	1568
Q Serve(g_s), s	0.9	22.3	22.3	10.2	27.0	27.4	4.5	0.0	9.4	3.0	0.0	0.2
Cycle Q Clear(g_c), s	0.9	22.3	22.3	10.2	27.0	27.4	4.5	0.0	9.4	3.0	0.0	0.2
Prop In Lane	1.00		0.22	1.00		0.13	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	31	801	812	535	1045	1075	125	0	227	82	0	189
V/C Ratio(X)	0.64	0.73	0.73	0.82	0.75	0.76	0.78	0.00	0.81	0.78	0.00	0.03
Avail Cap(c_a), veh/h	85	851	862	703	1127	1159	213	0	342	192	0	323
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	40.2	18.2	18.2	33.6	12.2	12.3	37.6	0.0	34.1	38.9	0.0	32.0
Incr Delay (d2), s/veh	19.6	2.9	2.9	5.7	2.7	2.7	10.1	0.0	8.7	14.6	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	11.3	11.5	5.2	13.6	14.2	2.6	0.0	4.6	1.8	0.0	0.1
LnGrp Delay(d),s/veh	59.8	21.1	21.1	39.3	14.8	15.0	47.7	0.0	42.9	53.5	0.0	32.0
LnGrp LOS	E	C	C	D	B	B	D		D	D		C
Approach Vol, veh/h		1193			2036		283				69	
Approach Delay, s/veh		21.8			20.1		44.5				52.0	
Approach LOS		C			C		D				D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.8	16.0	16.9	41.7	9.9	13.9	5.5	53.1
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	9.0	18.0	17.0	40.0	10.0	17.0	4.0	53.0
Max Q Clear Time (g_c+I1), s	5.0	11.4	12.2	24.3	6.5	2.2	2.9	29.4
Green Ext Time (p_c), s	0.0	0.5	0.7	13.4	0.1	0.9	0.0	18.9

Intersection Summary		
HCM 2010 Ctrl Delay		23.2
HCM 2010 LOS		C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	116	1381	297	260	1054	230	624	271	301	230	410	116
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1845	1845	1845	1845	1845	1900	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	126	1501	165	283	1146	250	678	295	327	250	446	126
Adj No. of Lanes	1	3	1	1	3	0	2	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	155	1511	470	299	1581	345	682	367	328	282	460	129
Arrive On Green	0.09	0.30	0.30	0.17	0.38	0.38	0.20	0.21	0.21	0.16	0.17	0.17
Sat Flow, veh/h	1757	5036	1568	1757	4140	903	3408	1752	1568	1757	2705	758
Grp Volume(v), veh/h	126	1501	165	283	929	467	678	295	327	250	288	284
Grp Sat Flow(s),veh/h/ln	1757	1679	1568	1757	1679	1685	1704	1752	1568	1757	1752	1711
Q Serve(g_s), s	7.0	29.7	8.2	15.9	23.7	23.7	19.9	16.0	20.8	13.9	16.3	16.5
Cycle Q Clear(g_c), s	7.0	29.7	8.2	15.9	23.7	23.7	19.9	16.0	20.8	13.9	16.3	16.5
Prop In Lane	1.00		1.00	1.00		0.54	1.00		1.00	1.00		0.44
Lane Grp Cap(c), veh/h	155	1511	470	299	1283	644	682	367	328	282	298	291
V/C Ratio(X)	0.82	0.99	0.35	0.95	0.72	0.72	0.99	0.80	1.00	0.89	0.97	0.98
Avail Cap(c_a), veh/h	176	1511	470	299	1283	644	682	367	328	316	298	291
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.8	34.9	27.4	41.1	26.4	26.4	39.9	37.6	39.5	41.1	41.2	41.3
Incr Delay (d2), s/veh	22.5	21.6	0.4	38.2	2.1	4.1	33.1	12.3	48.6	22.9	42.7	46.5
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(50%),veh/ln	4.4	16.8	3.6	10.9	11.3	11.7	12.5	9.0	13.4	8.5	11.4	11.6
LnGrp Delay(d),s/veh	67.3	56.5	27.8	79.2	28.5	30.5	73.0	49.8	88.1	64.0	83.9	87.8
LnGrp LOS	E	E	C	E	C	C	E	D	F	E	F	F
Approach Vol, veh/h		1792			1679			1300			822	
Approach Delay, s/veh		54.6			37.6			71.5			79.2	
Approach LOS		D			D			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.1	24.9	21.0	34.0	24.0	21.0	12.8	42.2
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	18.0	19.0	17.0	30.0	20.0	17.0	10.0	37.0
Max Q Clear Time (g_c+I1), s	15.9	22.8	17.9	31.7	21.9	18.5	9.0	25.7
Green Ext Time (p_c), s	0.2	0.0	0.0	0.0	0.0	0.0	0.0	10.6

Intersection Summary			
HCM 2010 Ctrl Delay			57.0
HCM 2010 LOS			E

Appendix C

Project Driveway Queuing Calculations

Queuing and Blocking Report
AM Cumulative Conditions Alt Access 1 10/27/2015

Intersection: 10: Country Hills Road & Laurel Road

Movement	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	T	TR	L	L	T	T	L	R
Maximum Queue (ft)	246	275	54	84	106	115	136	154
Average Queue (ft)	143	200	34	54	54	61	85	96
95th Queue (ft)	267	321	61	94	111	125	147	175
Link Distance (ft)	561	561			889	889		331
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			200	200			250	
Storage Blk Time (%)								
Queuing Penalty (veh)								

Queuing and Blocking Report
PM Cumulative Conditions Alt Access 1 10/27/2015

Intersection: 10: Country Hills Road & Laurel Road

Movement	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	T	TR	L	L	T	T	L	R
Maximum Queue (ft)	151	166	92	116	116	109	72	76
Average Queue (ft)	91	107	62	86	71	53	49	50
95th Queue (ft)	160	181	116	127	144	116	81	87
Link Distance (ft)	561	561			889	889		331
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			200	200			250	
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 16: D Lane & Laurel Road

Movement	NB
Directions Served	R
Maximum Queue (ft)	85
Average Queue (ft)	45
95th Queue (ft)	88
Link Distance (ft)	212
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 16: D Lane & Laurel Road

Movement	NB
Directions Served	R
Maximum Queue (ft)	40
Average Queue (ft)	25
95th Queue (ft)	52
Link Distance (ft)	212
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report
AM Cumulative Plus Prj Cond Alt Access 1 10/27/2015

Intersection: 10: Country Hills Road & Laurel Road

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	22	191	238	61	75	108	112	138	174	61	11
Average Queue (ft)	6	136	175	24	47	58	64	89	104	39	3
95th Queue (ft)	25	209	268	61	82	121	125	154	188	76	14
Link Distance (ft)		560	560			863	863		331		350
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	215			200	200			250		100	
Storage Blk Time (%)		0							0	0	
Queuing Penalty (veh)		0							0	0	

Queuing and Blocking Report
PM Cumulative + Prj Cond Alt Access 1 10/27/2015

Intersection: 10: Country Hills Road & Laurel Road

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	20	183	203	95	128	159	168	79	103	56	15
Average Queue (ft)	9	109	128	59	96	90	91	54	64	29	3
95th Queue (ft)	28	201	229	106	165	191	187	96	116	64	15
Link Distance (ft)		560	560			863	863		331		350
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	215			200	200			250		100	
Storage Blk Time (%)		1				0				0	
Queuing Penalty (veh)		0				2				0	

Queuing and Blocking Report
AM Cumulative Plus Prj Cond Alt Access 1

10/27/2015

Intersection: 16: D Lane & Laurel Road

Movement	NB	SB
Directions Served	R	R
Maximum Queue (ft)	50	35
Average Queue (ft)	34	15
95th Queue (ft)	59	42
Link Distance (ft)	212	239
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
PM Cumulative + Prj Cond Alt Access 1

10/27/2015

Intersection: 16: D Lane & Laurel Road

Movement	NB	SB
Directions Served	R	R
Maximum Queue (ft)	47	18
Average Queue (ft)	28	4
95th Queue (ft)	54	20
Link Distance (ft)	212	239
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Appendix D

Alternative Access Queuing Calculations

Intersection: 16: D Lane & Laurel Road

Movement	WB	NB
Directions Served	L	R
Maximum Queue (ft)	30	75
Average Queue (ft)	13	44
95th Queue (ft)	36	78
Link Distance (ft)		212
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	200	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 16: D Lane & Laurel Road

Movement	WB	NB
Directions Served	L	R
Maximum Queue (ft)	71	44
Average Queue (ft)	36	32
95th Queue (ft)	75	51
Link Distance (ft)		212
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	200	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
AM Cumulative Plus Prj Cond Alt Access 2 10/27/2015

Intersection: 16: D Lane & Laurel Road

Movement	WB	NB	SB
Directions Served	L	R	R
Maximum Queue (ft)	44	69	34
Average Queue (ft)	18	40	14
95th Queue (ft)	52	72	41
Link Distance (ft)		212	239
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	200		
Storage Blk Time (%)			
Queuing Penalty (veh)			

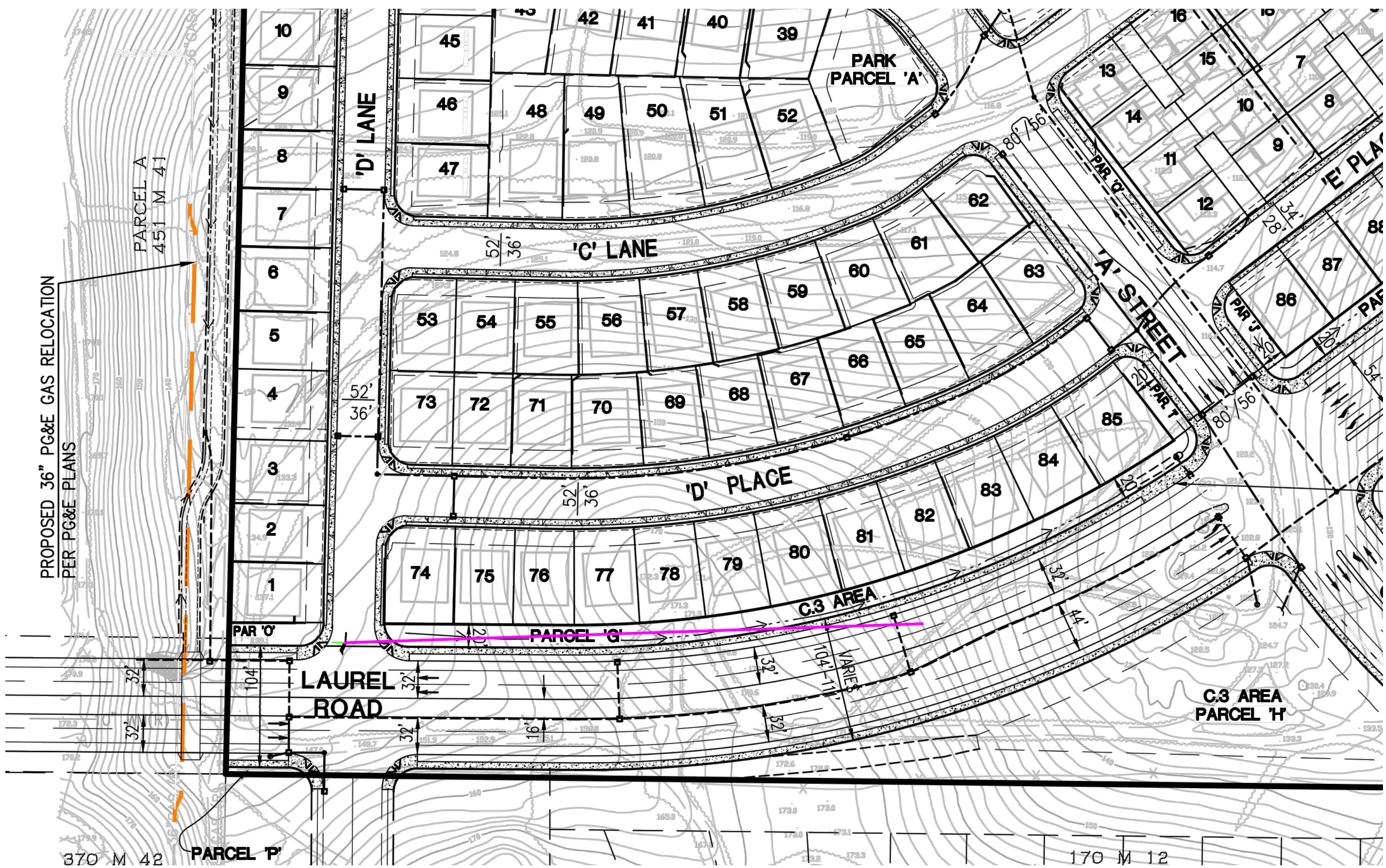
Queuing and Blocking Report
PM Cumulative Plus Prj Cond Alt Access 2 10/27/2015

Intersection: 16: D Lane & Laurel Road

Movement	EB	WB	NB	SB
Directions Served	TR	L	R	R
Maximum Queue (ft)	8	56	45	18
Average Queue (ft)	2	29	27	7
95th Queue (ft)	11	68	53	27
Link Distance (ft)	1176		212	239
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		200		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Appendix E

Sight Distance



W-Trans, Inc

490 Mendocino Ave, Suite 201
Santa Rosa, CA
(707)542-9500 Fax (707)542-9590

Sight Distance Lines at D Lane

Laurel Ranch Subdivision

DRAWN: bkb	SCALE: NTS
DESIGN:	DATE: 10/28/15
SHEET 1 SHEETS	JOB NO. 1

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A.2 - Traffic Technical Memorandum prepared by Fehr & Peers for 2009 Park Ridge Addendum

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Appendices

Appendix A

Transportation Analysis & Appendices

FEHR & PEERS
TRANSPORTATION CONSULTANTS

TECHNICAL MEMORANDUM

Date: November 28, 2008

To: Richard T. Loewke, AICP

From: Sam Tabibnia and Ellen Robinson

Subject: Antioch Davidon Homes Transportation Analysis

WC05-2153

This memorandum documents the results of the updated traffic analysis completed for the proposed Davidon Homes project. The proposed development is part of the Future Urbanization Area (FUA) #2 Specific Plan, which was originally analyzed in an EIR certified in 1996. The transportation section of the EIR was based on future growth assumptions developed in the early 1990s. Although the planned development within the specific plan area has not changed drastically since the certification of the EIR in 1996, the planned transportation infrastructure and traffic conditions have changed to require a new analysis. Thus, this study uses more recent traffic counts and forecasts to update the future traffic analyses and determine if the proposed Project would cause any new traffic impacts that were not identified in the 1996 EIR. Note that this updated analysis focuses on traffic impacts and a few specific issues that have been raised; it does not provide a broad analysis of other transportation issues such as bicycle and pedestrian circulation, transit services, or on-site circulation.

Based on the analysis, the Project would cause a significant impact at the Lone Tree Way/Hillcrest Avenue intersection under Cumulative conditions. The impact can be mitigated by restriping the southbound Hillcrest Avenue approach to one exclusive right-turn lane, one through lane, and two exclusive left-turn lanes, and providing an additional left-turn lane on the eastbound Lone Tree Way approach.

In addition, the following improvements are also recommended. These improvements would enhance traffic flow in the study area. However, they are not identified as significant impacts because they do not exceed the significance criteria used in this analysis.

- At the Lone Tree Way/Canada Valley Road intersection, convert the southbound through lane to a shared through/left-turn lane. This will also require implementation of split phasing signal operations in the north/south directions. This modification is needed under Near-Term conditions only and the intersection can be converted back to its current configuration after project access to Laurel Road in the north is completed.

  In addition, if the full project is completed under Near-Term Plus Project conditions without any direct connections to Laurel Road, the queues on southbound Canada Valley Road at Lone Tree Way would spill back to the upstream intersection even if the above stated improvements are implemented. Based on our analysis, about 50 percent of the Davidon project, corresponding to about 270 single-family residential units, can be developed before access to Laurel Road would be required.

- At the Canada Valley Road/Vista Grande Drive/Pinnacle View Way, consider strategies that would enhance pedestrian safety and encourage walking between the Davidon Homes project and the existing elementary school and park on Vista Grande Drive. Potential improvement options, such as high-visibility cross-walks, in-crosswalk signage, flashing beacons/signs, in-pavement warning lights, and/or HAWK signals are described in detail starting on page 10 of this memorandum.

- At the Laurel Road/Country Hills Drive intersection, consider providing a second left-turn lane on westbound Laurel Road into southbound Country Hills Drive in order to reduce the likelihood for queue spillover into the through lanes. This will also require providing a second 300-foot receiving lane on southbound Country Hills Drive.

This memorandum includes the following sections:

- ***Study Area*** – describes the project study area and defines the study intersections.
- ***Analysis Methodology –*** Describes the methodologies used to analyze project impacts.
- ***Existing Conditions –*** Describes the current conditions in the vicinity of the proposed project.
- ***Near-Term Conditions Analysis –*** Provides an analysis of project impacts under Near-Term conditions that accounts for other developments expected to be completed in the next few years.
- ***Cumulative Conditions Analysis –*** Provides an analysis of project impacts under Cumulative conditions that accounts for buildout of the City's General Plan.
- ***CCTA Traffic Service Objectives Analysis –*** Provides an analysis of traffic service objectives on routes of regional significance as required by Contra Costa Transportation Authority (CCTA).

STUDY AREA

The proposed Project would consist of 525 dwelling units located on the south side of Laurel Road between Canada Valley Road and Country Hills Drive in the City of Antioch. This analysis focuses on the operations of the following key intersections in the vicinity of the site:

1. Laurel Road/Canada Valley Road
2. Laurel Road/Country Hills Drive
3. Laurel Road/Southbound SR 4 Bypass Ramps
4. Laurel Road/Northbound SR 4 Bypass Ramps
5. Laurel Road/Slatten Ranch Road
6. Laurel Road/Live Oak Avenue
7. Laurel Road/Empire Avenue
8. Lone Tree Way/Canada Valley Road
9. Lone Tree Way/Southbound SR 4 Bypass Ramps
10. Lone Tree Way/Northbound SR 4 Bypass Ramps
11. Lone Tree Way /Slatten Ranch Road
12. Lone Tree Way/Empire Avenue
13. Lone Tree Way/Deer Valley Road
14. Lone Tree Way/Hillcrest Avenue
15. Lone Tree Way/Vista Grande Drive
16. Country Hills Drive/Hillcrest Avenue
17. Laurel Road/Tree Line Way (With Project only)
18. Laurel Road/Hillcrest Avenue

The locations of the study intersections are shown on Figure 1. Figure 2 presents the proposed site plan for the Project.

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ANALYSIS METHODOLOGY

Study intersection operations were evaluated using Level of Service (LOS) calculations. The analysis method outlined in *Technical Procedures Update* prepared by the Contra Costa Transportation Authority (CCTA) (July, 2006), known as CCTALOS, was utilized. To augment this analysis, the Transportation Research Board's 2000 *Highway Capacity Manual* (HCM) method and Synchro software were also used.

Level of Service Criteria

In order to measure and describe the operation of a local roadway network, traffic engineers and planners commonly use a grading system called level of service (LOS) to describe intersection operations. The LOS grading system qualitatively characterizes traffic conditions associated with varying levels of traffic. These levels range from LOS A, indicating free-flow traffic conditions with little or no delay experienced by motorists, to LOS F, which describes congested conditions where traffic flows exceed design capacity, resulting in long queues and delays.

At each study intersection, traffic conditions were evaluated using the LOS methodologies developed by the CCTA and HCM. The CCTA planning-level analysis uses various intersection characteristics (i.e., traffic volumes, lane geometry, and signal phasing) to estimate the volume-to-capacity (v/c) ratio of an intersection. Table 1 summarizes the relationship between the v/c ratio and LOS. HCM operation analysis uses various intersection characteristics (i.e., traffic volumes, lane geometry, signal timing, and pedestrian activity) to estimate the average delay (measured in seconds per vehicle) experienced by motorists traveling through an intersection. Table 2 summarizes the relationship between delay and LOS for signalized and unsignalized intersections. Typically, the delay and LOS for the worse movement from the side-street is reported for side-street stop-controlled intersections.

TABLE 1
INTERSECTION LEVEL OF SERVICE DEFINITIONS (CCTA)

Level of Service	Sum of Critical Volume-to-Capacity Ratio	Description
A	< 0.60	Stable Flow: Very slight or no delay. No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication.
B	0.61 - 0.70	Stable Flow: Slight delay. An occasional approach phase is fully utilized.
C	0.71 - 0.80	Stable Flow: Acceptable delay. A few drivers arriving at the end of a queue may occasionally have to wait through one signal cycle.
D	0.81 - 0.90	Approaching Unstable Flow: Tolerable delay. Delays may be substantial during short periods, but excessive back ups do not occur.
E	0.91 - 1.00	Unstable Flow: Intolerable delay. Delay may extend through several cycle lengths.
F	> 1.00	Forced Flow: Excessive delay.

Source: *Technical Procedures,* Contra Costa Transportation Authority, 1997.

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TABLE 2
INTERSECTION LEVEL OF SERVICE DEFINITIONS
(HIGHWAY CAPACITY MANUAL)

Level of Service	Description	Average Control Delay (Seconds)
Signalized Intersections		
A	Operations with very low delay occurring with favorable progression and/or short cycle length.	≤ 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	> 10.0 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20.0 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35.0 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	> 55.0 to 80.0
F	Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	> 80.0
Unsignalized Intersections		
A	Little or no delays	≤ 10.0
B	Short traffic delays	> 10.0 to 15.0
C	Average traffic delays	> 15.0 to 25.0
D	Long traffic delays	> 25.0 to 35.0
E	Very long traffic delays	> 35.0 to 50.0
F	Extreme traffic delays with intersection capacity exceeded	> 50.0

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

The CCTALOS methodology can produce different results than the HCM methodology. The primary reason that the methodologies produce different results is that the CCTALOS methodology analyzes each intersection independently as an isolated intersection and calculates LOS based on the theoretical capacity of each movement at the intersection. LOS in the HCM methodology is based on the delay experienced by each vehicle, which is a function of the physical characteristics of the intersection including signal timing and phasing.

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Significance Criteria

The following criteria were used to determine if the proposed Project would have a significant impact on the study intersections:

- A significant impact occurs if any basic route intersection operations within regional commercial areas or within 1,000 feet of a freeway interchange (Intersections 2-5) deteriorate below an acceptable minimum LOS Low level E (v/c = 0.94) (GM Policy 3.4.2.1a).
- A significant impact occurs if any basic route intersection operations on other residential or arterial roadways (Intersections 1 and 17) deteriorate below an acceptable minimum LOS Mid-Range D (v/c = 0.87) (GM Policy 3.4.2.1c).
- A significant impact occurs if intersection operations on regional routes of significance or basic intersections outside the Antioch Planning Area (Intersections 6-13, 14, 15, 16 and 18) deteriorate below the adopted Action Plan acceptable minimum LOS D or better (v/c = 0.89) to an unacceptable level E or F (GM Policy 3.4.1.1).
- A significant impact occurs if the v/c ratio at an intersection operating at an unacceptable level (LOS E or F) increases by more than 0.02 (2003 General Plan EIR).
- A significant impact occurs if the average delay at an intersection operating at an unacceptable level (LOS E or F) increases by more than 5 seconds (2003 General Plan EIR).
- A significant impact occurs at an unsignalized intersection if operations decline from an acceptable level to an unacceptable level (as defined above), and the need occurs for installation of a traffic signal based on the *Manual on Uniform Traffic Control Devices* (MUTCD) Peak Hour Signal Warrant (Warrant 3).
- Operations of a roadway segment to exceed the established traffic service objective (TSO) standard.
- Deterioration in a roadway segment that already exceeds the established TSO standard by increasing the roadway volume by more than one percent.

EXISTING CONDITIONS

City of Antioch provided weekday morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak period intersection turning movement counts in May 2008 at the study intersections. The existing traffic counts are provided in Appendix A. For each intersection, the single hour with the highest traffic volumes during each count period was identified. The peak hour volumes are presented on Figure 3. The peak hour data is used as the basis for intersection operations analysis. These counts were collected after Segment 1 of the SR 4 Bypass freeway between SR 4 and Lone Tree Way was opened for public use and account for the resulting changes in local and regional traffic pattern. The existing lane configurations and traffic control at the study intersections are shown on Figure 4.

Intersection operations were analyzed at ten of the study intersections using both the HCM and CCTALOS methodologies. Only these ten intersections were analyzed under Existing and Near-Term conditions because the other intersections either do not exist or the proposed project would not add substantial amount of traffic to them under Existing and Near-Term conditions because of the roadway network that would be completed under Near-Term conditions.

Table 3 summarizes LOS at the study intersection, as calculated using both HCM and CCTALOS methodologies. The detailed intersection LOS calculation sheets are provided in Appendices B and C for both HCM and CCTALOS methodologies, respectively. Using either HCM or CCTALOS methodologies, the ten study intersections currently operate at LOS D or better during both AM and PM peak hours using either the HCM or CCTALOS methodologies.

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TABLE 3
EXISTING CONDITIONS
PEAK HOUR LEVEL OF SERVICE

No.	Intersection	Control[1]	Peak Hour	HCM		CCTALOS	
				Delay	LOS[2]	V/C	LOS[3]
8	Lone Tree Way/Canada Valley Road	Signal	AM PM	19 26	B C	0.38 0.54	A A
9	Lone Tree Way/Southbound SR 4 Bypass Ramps	Signal	AM PM	20 20	B B	0.51 0.59	A A
10	Lone Tree Way/Northbound SR 4 Bypass Ramps	Signal	AM PM	22 14	C B	0.31 0.48	A A
11	Lone Tree Way/Slatten Ranch Road	Signal	AM PM	24 30	C C	0.46 0.49	A A
12	Lone Tree Way/Empire Avenue	Signal	AM PM	30 30	C C	0.48 0.50	A A
13	Lone Tree Way/Deer Valley Road	Signal	AM PM	42 40	D D	0.71 0.61	C B
14	Lone Tree Way/Hillcrest Avenue	Signal	AM PM	33 29	C C	0.44 0.54	A A
15	Lone Tree Way/Vista Grande Drive	Signal	AM PM	13 13	B B	0.32 0.44	A A
16	Country Hills Drive/Hillcrest Avenue	Signal	AM PM	39 27	D C	0.44 0.32	A A
18	Laurel Road/Hillcrest Avenue	Signal	AM PM	21 17	C B	0.34 0.22	A A

Note: **Bold** indicates intersections exceeding LOS standard.
1. Signal = signal controlled intersection; SSS = side street stop controlled intersection.
2. Level of service for intersections based on control delay per vehicle, according to the *Highway Capacity Manual*, Transportation Research Board, 2000.
3. Signalized intersection level of service is based on v/c ratio according to the *Contra Costa Transportation Authority Technical Procedures Manual, 1997(CCTA)*.

Source: Fehr & Peers, 2008.

PROJECT TRIP GENERATION AND DISTRIBUTION

The proposed Davidon Homes project would consist of 525 single-family dwelling units. Vehicle trips generated by the Project were estimated by applying trip generation rates from Institute of Transportation Engineers *Trip Generation* (7th Edition). As summarized in Table 4, the proposed Project is estimated to generate 394 AM peak hour trips and 530 PM peak hour trips.

Project trip distribution takes into account the location, land use, and density of other developments within the study area and the major travel routes that serve the Project area. Trip distribution for the Project is shown on Figure 5. This trip distribution is consistent with the trip distribution presented in the *Traffic Study for the Proposed Laurel Ranch Development* (TJKM, February 2004).

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TABLE 4
PROPOSED PROJECT TRIP GENERATION

Land Use	Size	Daily Trips	AM Trips			PM Trips		
			In	Out	Total	In	Out	Total
Single Family Residential[1]	525 d.u.	5,024	98	296	394	334	196	530

Notes: d.u. = dwelling unit

1. ITE Land Use Category 210 Single Family Detached Housing:
   Daily: T = 9.57 (x)
   AM: T = 0.75 (x) ; In = 25%, out = 75%
   PM: T = 1.01 (x) ; In = 63%, Out = 37%

Source: Fehr & Peers, 2008.

NEAR-TERM CONDITIONS

The analysis of Near-Term No Project and Near-Term With Project conditions are described below.

Near-Term No Project Conditions

The Near-Term conditions represents traffic conditions in the near future. It accounts for traffic that will be generated by projects currently under construction or expected to be completed within the next few years in the vicinity of the proposed project. For this analysis, traffic generated by the following projects was added to the Existing Conditions volumes to estimate traffic volumes under Near-Term No Project conditions:

- Deer Valley Estates (136 single-family dwelling units)
- Hidden Glen (371 single-family dwelling units)
- Sand Creek Ranch (308 single-family dwelling units)
- Tierra Villas (122 single-family dwelling units)
- Lone Tree Landing (33,000 square feet of retail)
- Wal-Mart expansion (33,575 square feet of retail)

Intersection volumes under Near-Term No Project conditions are presented on Figure 5. This analysis assumes that the roadway network and intersection configurations under Near-Term conditions would remain same as the Existing conditions. Tables 4 summarizes peak hour LOS at the study intersection under Near-Term No Project conditions. The detailed intersection LOS calculation sheets are provided in Appendices B and C. All study intersections would continue to operate at LOS D or better under Near-Term No Project conditions using either the HCM or CCTALOS methodologies.

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TABLE 4
NEAR-TERM CONDITIONS
PEAK HOUR LEVEL OF SERVICE

No.	Intersection	Control[1]	Peak Hour	No Project				With Project [4]			
				HCM		CCTALOS		HCM		CCTALOS	
				Delay	LOS[2]	V/C	LOS[3]	Delay	LOS[2]	V/C	LOS[3]
8	Lone Tree Way/Canada Valley Road	Signal	AM PM	21 29	C C	0.45 0.65	A B	37 47	D D	0.59 0.73	A C
9	Lone Tree Way/Southbound SR 4 Bypass Ramps	Signal	AM PM	19 24	B C	0.60 0.74	B C	21 30	C C	0.65 0.81	B D
10	Lone Tree Way/Northbound SR 4 Bypass Ramps	Signal	AM PM	20 15	B B	0.34 0.55	A A	20 15	B B	0.36 0.58	A A
11	Lone Tree Way/Slatten Ranch Road	Signal	AM PM	21 28	C C	0.48 0.55	A A	22 28	C C	0.49 0.57	A A
12	Lone Tree Way/Empire Avenue	Signal	AM PM	31 33	C C	0.57 0.64	A B	30 35	C C	0.62 0.70	B C
13	Lone Tree Way/Deer Valley Road	Signal	AM PM	43 42	D D	0.77 0.73	C C	44 42	D D	0.78 0.75	C C
14	Lone Tree Way/Hillcrest Avenue	Signal	AM PM	36 35	D C	0.54 0.63	A B	36 35	D D	0.55 0.66	A B
15	Lone Tree Way/Vista Grande Drive	Signal	AM PM	11 13	B B	0.35 0.49	A A	11 13	B B	0.37 0.50	A A
16	Country Hills Drive/Hillcrest Avenue	Signal	AM PM	36 23	D C	0.50 0.36	A A	40 27	D C	0.53 0.41	A A
18	Laurel Road/Hillcrest Avenue	Signal	AM PM	19 14	B B	0.40 0.29	A A	19 14	B B	0.41 0.30	A A

Note: **Bold** indicates intersections exceeding LOS standard.
1. Signal = signal controlled intersection.
2. Level of service for intersections based on control delay per vehicle, according to the *Highway Capacity Manual*, Transportation Research Board, 2000.
3. Signalized intersection level of service is based on v/c ratio according to the *Contra Costa Transportation Authority Technical Procedures Manual, 1997(CCTA)*.
4. The project analyzed under this scenario includes all phases of the development (i.e., 525 dwelling units).

Source: Fehr & Peers, 2008.

Near-Term With Project Conditions

Trips generated by the proposed Davidon Homes project were added to the Near-Term No Project volumes to estimate the Near-Term With Project Volumes shown on Figure 7. The Near-Term With Project conditions analysis includes all phases of the Davidon Homes development, consisting of 525 dwelling units. This analysis assumes that the roadway network would remain same as the existing roadway network and all study intersections would continue to have the same configuration. Thus, this analysis assumes that Laurel Road would not be extended further west from the SR 4 Bypass and the proposed Davidon Homes project would not connect to Laurel Road. All access for the proposed

Davidon Homes project would be to and from the south through Vista Grande Drive and Canada Valley Road.

Table 4 summarizes LOS results at the study intersections under Near-Term With Project conditions using both HCM and CCTALOS methodologies. The detailed intersection LOS calculation sheets are provided in Appendices B and C. Although delay experienced by vehicles would increase and LOS would deteriorate under Near-Term Plus Project conditions, the study intersections would continue to operate at LOS D or better.

Queuing on Southbound Canada Valley Road at Lone Tree Way

The Lone Tree Way/Canada Valley Road intersection currently operates at LOS B during the AM peak hour and LOS C during the PM peak hour based on the HCM methodology. The intersection would operate at LOS D under Near-Term With Project conditions. Since the intersection would continue to operate at an acceptable LOS, The project would not cause a significant impact at this intersection using the significance criteria described earlier.

However, based on the completed analysis and confirmed by field observations, the queue on southbound left-turn on Canada Valley Road onto eastbound Lone Tree Way currently exceeds the 170-foot left-turn pocket during both AM and PM peak hours. Table 5 presents the 95^{th} percentile queues on the southbound approach of the intersection under Existing and Near-Term conditions. The detailed queuing analysis reports are included in Appendix D. The queue is expected to increase under Near-Term No Project conditions and would be further exacerbated by the addition of traffic generated by the buildout of the proposed Davidon Homes project.

TABLE 5
QUEUE LENGTHS AT LONE TREE WAY/CANADA VALLEY ROAD

Lane	Storage Length (feet)	Peak Hour	95^{th} Percentile Queue Length (feet)[1]							
			Existing Conditions		Near-Term No Project		Near-Term With Full Project[3]		Near-Term With Partial Project[3]	
			Existing Phasing	N/S Split Phasing[2]	Existing Phasing	N/S Split Phasing[2]	Existing Phasing	N/S Split Phasing[2]	Existing Phasing	N/S Split Phasing[2]
Southbound Through	320	AM PM	50 70	170 140	50 70	170 140	50 70	**370** **360**	50 70	310 300
Southbound Left	170	AM PM	**250** **250**	160 140	**250** **290**	160 140	**650** **570**	**260** **250**	**550** **510**	170 160

Note: **Bold** indicates queue exceeding storage length.

1. 95^{th} percentile queue as calculated by Synchro.
2. This includes implementation of split phasing in the north/south direction and converting the southbound through lane to a shared left-turn/through lane.
3. The project analyzed under this scenario includes all phases of the development (i.e., 525 dwelling units).
4. The project analyzed under this scenario includes 270 dwelling units.

Source: Fehr & Peers, 2008.

The current roadway configuration and the adjacent developments do not allow for providing an additional left-turn lane or lengthening the existing left-turn lane. However, the queue spillover can be alleviated by converting the exclusive southbound through-lane to a shared through/left-turn lane. This lane configuration would require the intersection signal operation to be converted to split phasing in the northbound and southbound directions. The pedestrian signal phases on both the east and west sides of the intersection can still be maintained.

As shown in Table 5, the proposed intersection reconfiguration would reduce the 95th percentile queues on southbound Canada Valley Road under Existing and Near-Term No Project conditions to less than the provided storage length. However, the 95th percentile queues under the Near-Term With Project scenario (where development of the full Davidon project is assumed) after the implementation of the proposed improvement, would be longer than the provided capacity on both the exclusive left-turn lane and the shared left-turn/through lane and queues would spill back to the upstream intersection. It is estimated that the proposed Davidon project would need to be reduced by about 50 percent to about 270 units in order to reduce the queues on southbound Canada Valley Road to be accommodated within the provided storage capacity.

The Lone Tree Way/Canada Valley Road intersection would continue to operate at acceptable LOS D or better after conversion of the exclusive through lane to a shared left/though lane and implementation of split phasing in the north/south direction under Existing, Near-Term No Project, and Near-Term With Project conditions during both AM and PM peak hours.

In the long term, new roadways would connect the Davidon Homes project site to the north through Country Hills Drive and Laurel Road. These roadways would allow trips generated by the Davidon project and adjacent developments to use the new roadways to access the SR 4 Bypass freeway. Thus, reducing the amount of traffic turning left from southbound Canada Valley Road onto Lone Tree Way. The Cumulative conditions analysis, presented in the following section, assumes that these roadway connections would be provided. Therefore, when the roadway connections to Laurel Road are completed, the Davidon Homes project can be completed. In addition, the southbound approach of the Lone Tree Way/Canada Valley Road intersection can be reverted back to its current configuration with exclusive left-turn and through lanes and protected left-turn signal operations in the north/south directions.

Pedestrian Crossing at the Vista Grande Drive/Canada Valley Road/Pinnacle View Way intersection

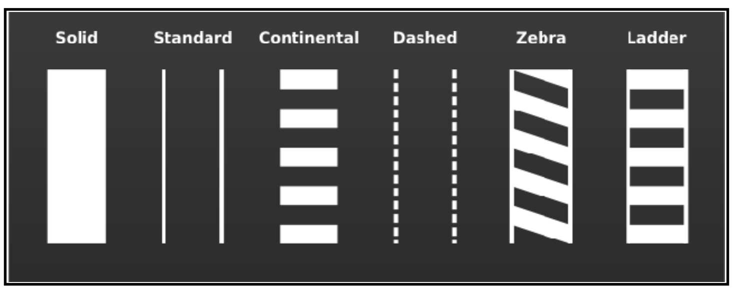
Canada Valley Road is designated as a collector by City of Antioch. The roadway has a design speed of 45 miles per hour (mph) and a posted speed limit of 30 mph, which is currently under consideration for an increase to 35 mph. As a matter of policy, City of Antioch does not install stop signs on collectors in order to maintain efficient traffic flow.

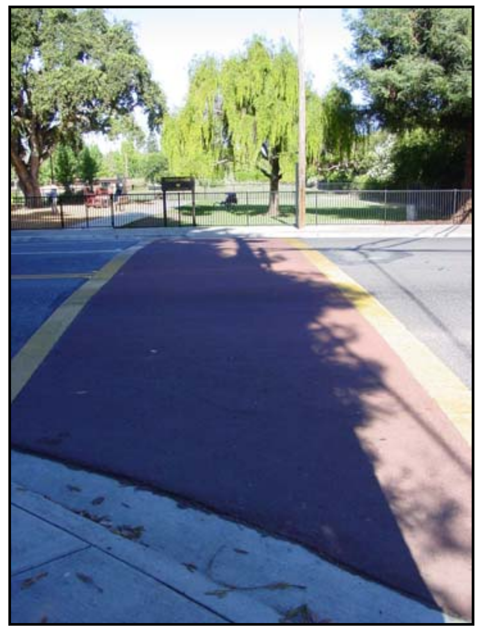
Currently, the Vista Grande Drive/Canada Valley Road/Pinnacle View Way intersection provides three approaches. Only the eastbound Vista Grande Drive approach is stop-controlled. The westbound Pinnacle View Way approach would be completed as part of the Davidon Homes project and would provide access to the project. The Carmen Dragon Elementary School and The Meadow Estates Creek Park are located about one-quarter mile west of the intersection on Vista Grande Drive. Pedestrians must cross Canada Valley Road at this intersection in order to access these uses from the Davidon Homes site. However, the intersection does not currently provide any protected pedestrian crossings and the somewhat high vehicle speeds on Canada Valley Road may deter pedestrians from walking.

Based on traffic volume forecasts developed for this analysis, the intersection is not expected to satisfy MUTCD peak hour intersection volume signal warrants after completion of the Davidon Homes project (See Appendix E). The intersection is also not expected to satisfy the MUTCD pedestrian volume signal warrant. Thus, conventional signalization of the intersection is not recommended at this time. However, periodic monitoring of vehicular and pedestrian volumes after the completion of the project should be considered to determine if the intersection would satisfy any additional MUTCD signal warrants in the future.

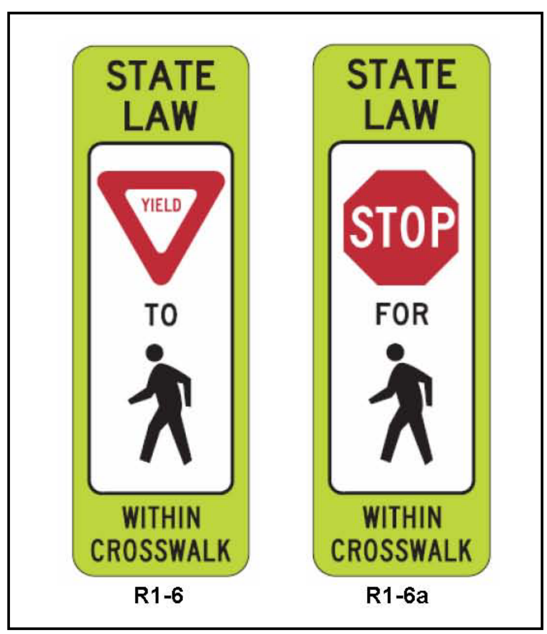
Since conventional signalization or all-way stops are not recommended at this intersection, potential options to improve pedestrian crossing at this intersection are discussed below.

- ***High Visibility Crosswalks*** – are crosswalks with different striping, patterns, or pavement material that increase the visibility of a crosswalk. They are often accompanied by other enhancements such as in-crosswalk signage, or flashing beacons.





- ***In-crosswalk Signage*** – (MUTCD Sign R1-6 or R-16a) are typically installed in the roadway median or center striping at unsignalized intersections to remind drivers of pedestrian right-of-way in crosswalk. They are usually manufactured with flexible material to not damage vehicles.



- ***Flashing Beacons/Signs*** – are overhead or side mounted signs or beacons that are installed at and/or in advance of a crosswalk and are actively or passively activated by pedestrians crossing the roadway. They typically rest on dark and are only activated when pedestrians are present to warn vehicles on the major approach of the roadway. When activated, they regularly flash or stutter amber light to capture driver attention.

- ***In-Pavement Warning Lights*** – Both sides of a crosswalk are lined with pavement markers, oftentimes containing an amber LED strobe-light. These are manually or passively activated by pedestrians and the strobe-lights provide a dynamic visual cue to drivers. However, their visibility deceases during periods or sunrise/sunset and high congestion. The in-pavement warning lights can be combined with flashing beacons to further increase effectiveness.

- ***HAWK Signal*** (High Intensity Activated Crosswalks) – Also known as a pedestrian hybrid signal is a special type of pedestrian activated signal used to warn and control traffic at an unsignalized location to assist pedestrian crossing a marked crosswalk. When not activated, the signal is dark. The HAWK signal is activated by a pedestrian push button. The overhead signal begins flashing yellow and then solid yellow, advising drivers to prepare to stop. The signal then displays a solid red and shows pedestrians a “Walk” indication. Finally, an alternating flashing red signal [“wig-wag”] indicates that motorists may proceed when safe, after coming to a full stop. The pedestrian is shown a flashing “Don’t Walk” with a countdown indicating the time left to cross.” The side-street movements would continue to be stop-controlled and are not controlled by the HAWK signal. The figures below show a HAWK signal in operations. These signals have been implemented in Tuscan, Arizona and British Colombia and are effective at enhancing pedestrian safety at locations with high vehicle speeds or volumes where normal signal warrants are not satisfied. Parameters for design and installation of HAWK signals are proposed to be included in the 2009 *Manual on Uniform Traffic Control Devices (MUTCD)*.

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Many of the tools discussed above can be used by themselves or in combination with each other to enhance pedestrian safety and encourage walking at the Vista Grande Drive/Canada Valley Road/ Pinnacle View Way intersection. Based on the significance criteria presented earlier, the condition at this intersection is not a significant impact; however, it is recommended that City staff select an appropriate improvement strategy at this location in consideration of the City's policies and resources in order to enhance pedestrian safety and encourage walking.

CUMULATIVE CONDITIONS

The analysis of Cumulative No Project and Cumulative With Project conditions are described below.

Cumulative No Project Conditions

The roadway network used for the Cumulative conditions analysis consists of roadway improvements expected to be completed by 2025. These assumptions are consistent with previously completed environmental documents in the area. Major roadway improvements in the vicinity of the Project assumed for this analysis include the following:

- Completion of Segment 2 of the SR 4 Bypass as a four-lane freeway between Lone Tree Way and Balfour Road.
- Extension of Laurel Road from its current terminus just west of the SR 4 Bypass to Hillcrest Avenue.
- Extension of Country Hills Drive north to Laurel Road
- Extension of Slatten Ranch Road from its current terminus just north of Lone Tree Way parallel to SR 4 Bypass.

Lane configurations and traffic control at the study intersections assumed for the Cumulative conditions analysis are presented on Figure 8.

The Cumulative conditions represents the buildout of the City of Antioch General Plan, expected in year 2025. The traffic forecasts used in this analysis were developed based on the CCTA East County Travel Demand Model as modified for the City of Antioch General Plan Update in 2003. Since the Cumulative traffic volume forecasts include the buildout of the proposed Davidon Project, the Cumulative No Project intersection volumes were calculated by subtracting the traffic generated by the proposed Project from the Cumulative intersection turning movement forecasts. The Cumulative No Project intersection volumes are shown on Figure 9.

Tables 6 summarizes peak hour LOS at the study intersections under Cumulative No Project conditions. The detailed intersection LOS calculation sheets are provided in Appendices B and C. The Lone Tree Way/Hillcrest Avenue intersection would operate at LOS E during the PM peak hour using either HCM or CCTALOS methodologies. All other study intersections would continue to operate at LOS D or better under Cumulative No Project conditions using either the HCM or CCTALOS methodologies.

Cumulative With Project Conditions

Trips generated by all phases on the proposed Davidon Homes project (525 units) were added to the Cumulative No Project volumes to estimate the Cumulative With Project Volumes shown on Figure 10. This analysis assumes that the roadway network would remain same as the Cumulative No Project conditions network. In comparison to the Near-Term conditions, the proposed Davidon Homes project would be connected to Laurel Road in the north and trips generated by the project can use the Laurel Road Interchange to access the freeway system.

Table 6 summarizes LOS results at the study intersections under Cumulative With Project conditions using both HCM and CCTALOS methodologies. The detailed intersection LOS calculation sheets are provided in Appendices B and C. Based on both methodologies, all study intersections, except the Laurel Road/Tree Line Way and Lone Tree Way/Hillcrest Avenue intersections, would operate at acceptable LOS D or better during both AM and PM peak hours.

The side-street stop-controlled Laurel Road/Tree Line Way intersection would operate at LOS F during the AM and PM peak hours, based on the HCM methodology. However, the intersection serves low traffic volumes and would not meet the MUTCD peak hour volume signal warrant. Thus, the proposed project would not cause an impact at this intersection because the significance criterion for unsignalized intersections requires the intersection to operate at an unacceptable LOS and satisfy the MUTCD peak hour signal warrant.

Under Cumulative No Project Conditions, the Lone Tree Way/Hillcrest Avenue intersection would operate at LOS D using the HCM methodology and LOS A using the CCTALOS methodology during the AM peak hour. During the PM peak hour, the intersection would operate at unacceptable LOS E using either HCM or CCTALOS methodologies. The addition of Project traffic would add more than 3 seconds of delay using the HCM methodology, therefore constituting a significant impact.

IMPACT 1: The addition of project traffic would contribute to unacceptable LOS E operations at the Lone Tree Way/Hillcrest Avenue intersection during the PM peak hour.

MITIGATION 1: This impact can be mitigated by reconfiguring the southbound Hillcrest Avenue approach (currently one exclusive right-turn lane, one through lane, one shared through and left-turn lane, and one exclusive left-turn lane) to an exclusive right-turn lane, one through lane, and two exclusive left-turn lanes, and providing a second left-turn lane on the eastbound Lone Tree Way approach. The Project should contribute its fair share toward the construction of this mitigation measure.

With implementation of this mitigation, the Lone Tree Way/Hillcrest Avenue intersection would improve to acceptable conditions (LOS C with 31 seconds of delay during the AM peak hour and LOS D with 46 seconds of delay during the PM peak hour using the HCM methodology and LOS A with v/c of 0.60 during the AM peak hour and LOS C with v/c of 0.75 during the PM peak hour using the CCTALOS methodology.)

This improvement was also recommended in the *Arcadia Mixed Use Planned Development EIR* (March 2002).

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TABLE 6
CUMULATIVE CONDITIONS
PEAK HOUR LEVEL OF SERVICE

No.	Intersection	Control[1]	Peak Hour	No Project				With Project [4]			
				HCM		CCTALOS		HCM		CCTALOS	
				Delay	LOS[2]	V/C	LOS[3]	Delay	LOS[2]	V/C	LOS[3]
1	Laurel Road/Canada Valley Road	Signal	AM PM	19 18	B B	0.51 0.48	A A	21 21	C C	0.53 0.52	A A
2	Laurel Road/Country Hills Drive	Signal	AM PM	32 26	C C	0.56 0.48	A A	37 30	D C	0.68 0.57	B A
3	Laurel Road/Southbound SR 4 Bypass Ramps	Signal	AM PM	17 16	B B	0.52 0.51	A A	17 15	B B	0.58 0.60	A A
4	Laurel Road/Northbound SR 4 Bypass Ramps	Signal	AM PM	7 10	A A	0.53 0.63	A B	9 12	A B	0.57 0.67	A B
5	Laurel Road/Slatten Ranch Road	Signal	AM PM	29 35	C D	0.69 0.75	A C	28 35	C C	0.69 0.76	B C
6	Laurel Road/Live Oak Ave	Signal	AM PM	16 27	B C	0.44 0.42	A A	16 24	B C	0.44 0.43	A A
7	Laurel Road/Empire Ave	Signal	AM PM	27 32	C C	0.55 0.52	A A	28 31	C C	0.56 0.55	A A
8	Lone Tree Way/Canada Valley Road	Signal	AM PM	25 36	C D	0.57 0.72	A C	26 38	C D	0.60 0.78	A C
9	Lone Tree Way/SB SR 4 Bypass Ramps	Signal	AM PM	23 24	C C	0.57 0.79	A C	23 24	C C	0.58 0.80	A C
10	Lone Tree Way/NB SR 4 Bypass Ramps	Signal	AM PM	9 16	A B	0.54 0.71	A C	10 16	A B	0.54 0.71	A C
11	Lone Tree Way/Slatten Ranch Road	Signal	AM PM	45 39	D D	0.72 0.79	C C	45 40	D D	0.72 0.80	C C
12	Lone Tree Way/Empire Avenue	Signal	AM PM	38 24	D C	0.61 0.57	B A	38 24	D C	0.61 0.57	B A
13	Lone Tree Way/Deer Valley Road	Signal	AM PM	49 53	D D	0.84 0.88	D D	50 55	D D	0.85 0.89	D D
14	Lone Tree Way/Hillcrest Avenue	Signal	AM PM	42 **58**	D **E**	0.60 **0.93**	A **E**	45 **66**	D **E**	0.62 **0.94**	B **E**
15	Lone Tree Way/Vista Grande Drive	Signal	AM PM	26 38	C D	0.56 0.84	A D	26 39	C D	0.57 0.85	A D
16	Country Hills Drive/ Hillcrest Avenue	Signal	AM PM	19 22	B C	0.42 0.53	A A	19 22	B C	0.42 0.54	A A
17	Laurel Road/Tree Line Way	SSS[2]	AM PM	N/A N/A	N/A N/A	N/A N/A	N/A N/A	**67** **68**	**F** **F**	N/A N/A	N/A N/A
18	Laurel Road/Hillcrest Avenue	Signal	AM PM	40 52	D D	0.85 0.87	D D	40 54	D D	0.85 0.88	D D

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Note: **Bold** indicates intersections exceeding LOS standard.
1. Signal = signal controlled intersection.
2. Level of service for intersections based on control delay per vehicle, according to the *Highway Capacity Manual*, Transportation Research Board, 2000.
3. Signalized intersection level of service is based on v/c ratio according to the *Contra Costa Transportation Authority Technical Procedures Manual, 1997(CCTA)*.
4. The project analyzed under this scenario includes all phases of the development (i.e., 525 dwelling units).
Source: Fehr & Peers, 2008.

Queuing on Westbound Laurel Road at Country Hills Drive

The analysis completed for this study assumes that the westbound Laurel Road provides a single left-turn lane into southbound Country Hills Drive. As shown in Table 6, the Laurel Road/Country Hills Drive intersection would operate at acceptable LOS D or better during both AM and PM peak hours under Cumulative Plus Project conditions using either HCM or CCTALOS methodologies. However, it is estimated that the close spacing of the Laurel Road/Southbound SR 4 Bypass Ramps intersection to the east limits the storage space available for the left-turn lane on westbound Laurel Road onto southbound Country Hills Drive to about 250 feet under Cumulative With Project conditions. Based on the completed analysis, the 95th percentile queue would be about 300 feet during the PM peak hour under Cumulative Plus Project conditions. Thus, the queue would occasionally spill out of the left-turn pocket and block traffic in the through lane during the peak hours; however since the intersection would operate at LOS D or better, the queue would clear at the end of each signal cycle.

The queue spillover can be alleviated by constructing a second left-turn lane on westbound Laurel Road. This would also require construction of a second receiving lane on southbound Country Hills Drive. The second lane would need to be about 300 feet. This improvement would reduce the 95th percentile queue to about 150 feet for each of the dual left-turn lane and reduce the likelihood that queues would spillover the left-turn pocket.

CCTA TRAFFIC SERVICE OBJECTIVES ANALYSIS

The *East County Action Plan for Routes of Regional Significance* (CCTA, 2000) establishes traffic service objectives (TSOs) for routes of regional significance in eastern Contra Costa County. These routes consist of freeways and major arterials that provide region wide connectivity.

One TSO used to measure freeway and arterial operations is peak hour Delay Index. Delay Index is defined as the ratio of the peak hour congested travel time to free-flow travel time on each roadway segment. For example, a Delay Index of 2.0 means that it takes twice as long to travel a particular segment during the peak commute hour than during non-commute hours when traffic moves at free-flow speeds. Objectives for relevant routes include a Delay Index of 2.5 for the SR 4 freeway and 2.0 for surface arterials.

Operations along routes of regional significance under Cumulative conditions were evaluated using the Delay Index measure. The Delay Index was calculated using results from the latest CCTA countywide travel demand model. As shown in Table 7, all roadway segments satisfy their TSO under Cumulative conditions.

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TABLE 7
CUMULATIVE CONDITIONS
DELAY INDEX SUMMARY[1]

Roadway Segment	Peak Hour	TSO	No Project		With Project	
			Northbound or Eastbound	Southbound or Westbound	Northbound or Eastbound	Southbound or Westbound
SR4 between A St. and Hillcrest Ave.	AM PM	2.5 2.5	1.0 1.6	1.3 1.1	1.0 1.6	1.3 1.1
SR4 between Hillcrest and SR160	AM PM	2.5 2.5	1.1 1.0	1.2 1.0	1.1 1.0	1.2 1.0
SR4 Bypass between SR160 and Laurel Rd	AM PM	2.5 2.5	1.2 1.4	1.1 1.0	1.2 1.4	1.1 1.0
SR4 Bypass between Laurel Rd and Lone Tree Way	AM PM	2.5 2.5	1.0 1.2	1.3 1.0	1.0 1.2	1.3 1.0
SR4 Bypass between Lone Tree Way and Sand Creek Rd	AM PM	2.5 2.5	1.0 1.2	1.3 1.0	1.0 1.2	1.3 1.0
Hillcrest Ave. between SR 4 and Deer Valley Rd.	AM PM	2.0 2.0	1.1 1.0	1.0 1.3	1.1 1.0	1.0 1.4
Hillcrest Ave. between Deer Valley Rd. and Laurel Rd.	AM PM	2.0 2.0	1.0 1.0	1.0 1.1	1.0 1.0	1.0 1.1
Hillcrest Ave. between SR 4 and Deer Valley Rd.	AM PM	2.0 2.0	1.0 1.0	1.0 1.0	1.0 1.0	1.0 1.0
Laurel Rd. between Hillcrest Ave. and SR4 Bypass	AM PM	2.0 2.0	1.0 1.0	1.0 1.0	1.0 1.0	1.0 1.0
Laurel Rd. between SR4 Bypass and Main St.	AM PM	2.0 2.0	1.0 1.2	1.2 1.0	1.0 1.2	1.2 1.0
Lone Tree Way between Deer Valley Rd. and Hillcrest Ave.	AM PM	2.0 2.0	1.0 1.0	1.0 1.0	1.0 1.1	1.0 1.0
Lone Tree Way between Hillcrest Ave. and SR4 Bypass	AM PM	2.0 2.0	1.0 1.1	1.0 1.0	1.0 1.1	1.0 1.0
Lone Tree Way between SR4 Bypass and Fairview Ave	AM PM	2.0 2.0	1.0 1.0	1.0 1.0	1.0 1.0	1.0 1.0

Note: **Bold** indicates roadway segments exceeding the TSO.

1. Delay Index defined as ratio of peak hour congested to free-flow travel time and as estimated by the CCTA Countywide Travel Demand.

Source: Fehr & Peers, 2008.

Please contact us with any questions or comments.

<u>Attachments:</u>

Figures

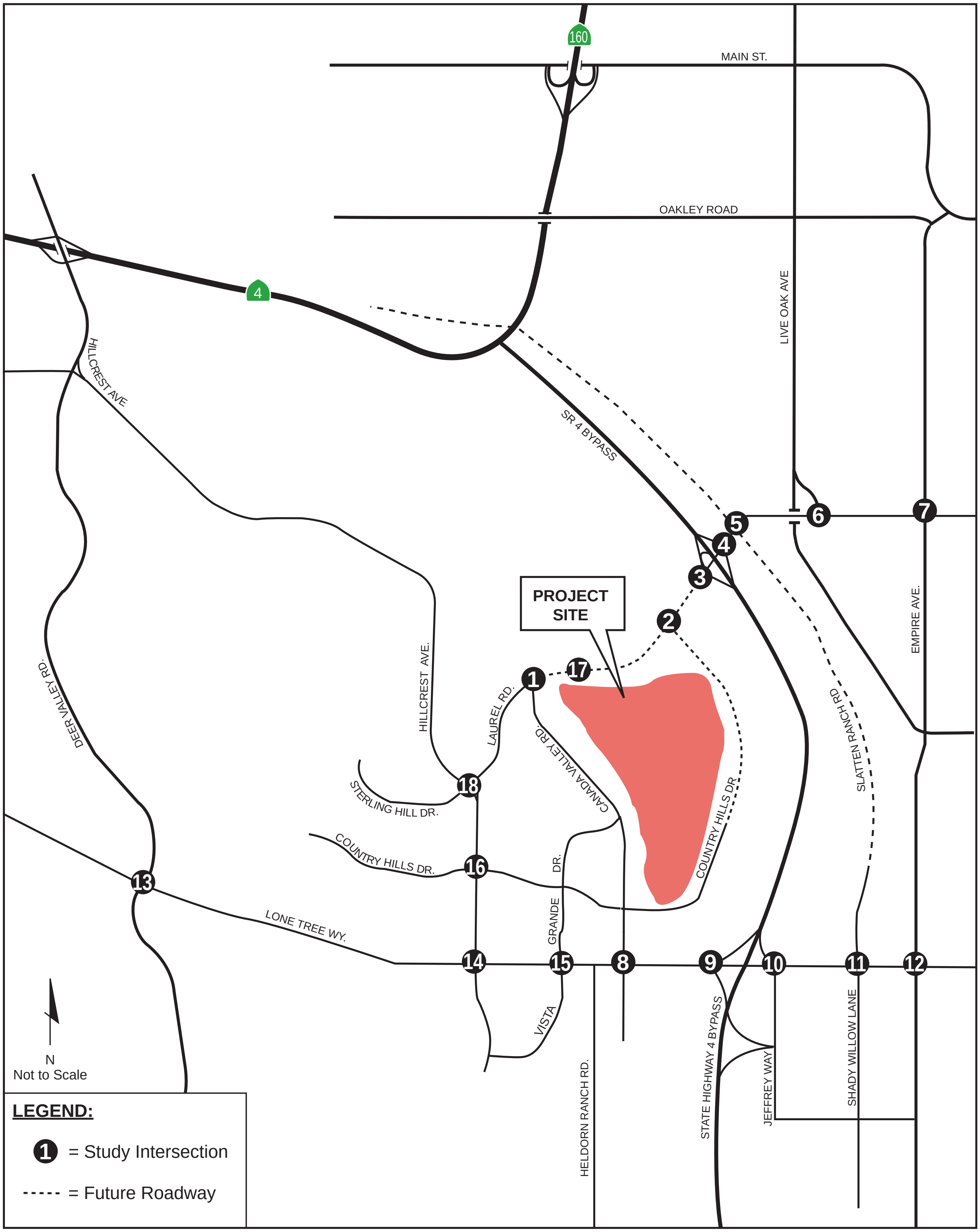
Appendix A: Existing Traffic Counts

Appendix B: HCM LOS Calculation Worksheets

Appendix C: CCTALOS Calculation Worksheets

Appendix D: Lone Tree Way/Canada Valley Road Queuing Reports (check sheets)

Appendix E: Vista Grande/Canada Valley/Pinnacle View Way Signal Warrant Worksheet



Davidon Homes Transportation Analysis

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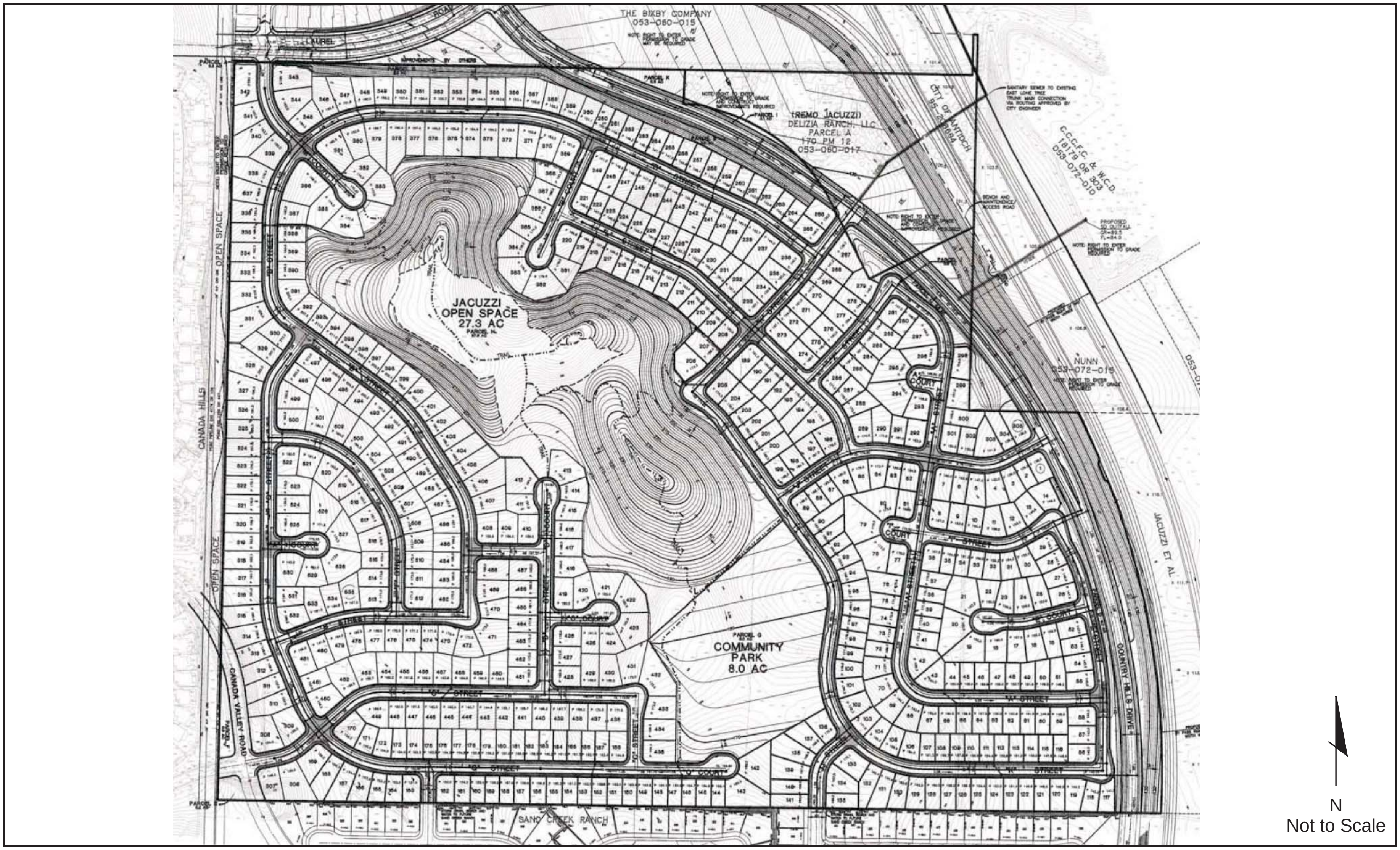
SITE VICINITY MAP AND STUDY INTERSECTION LOCATIONS

FIGURE 1

November 2008
Graphics\Nov08 Update\WC05-2153_1



Davidon Homes Transportation Analysis

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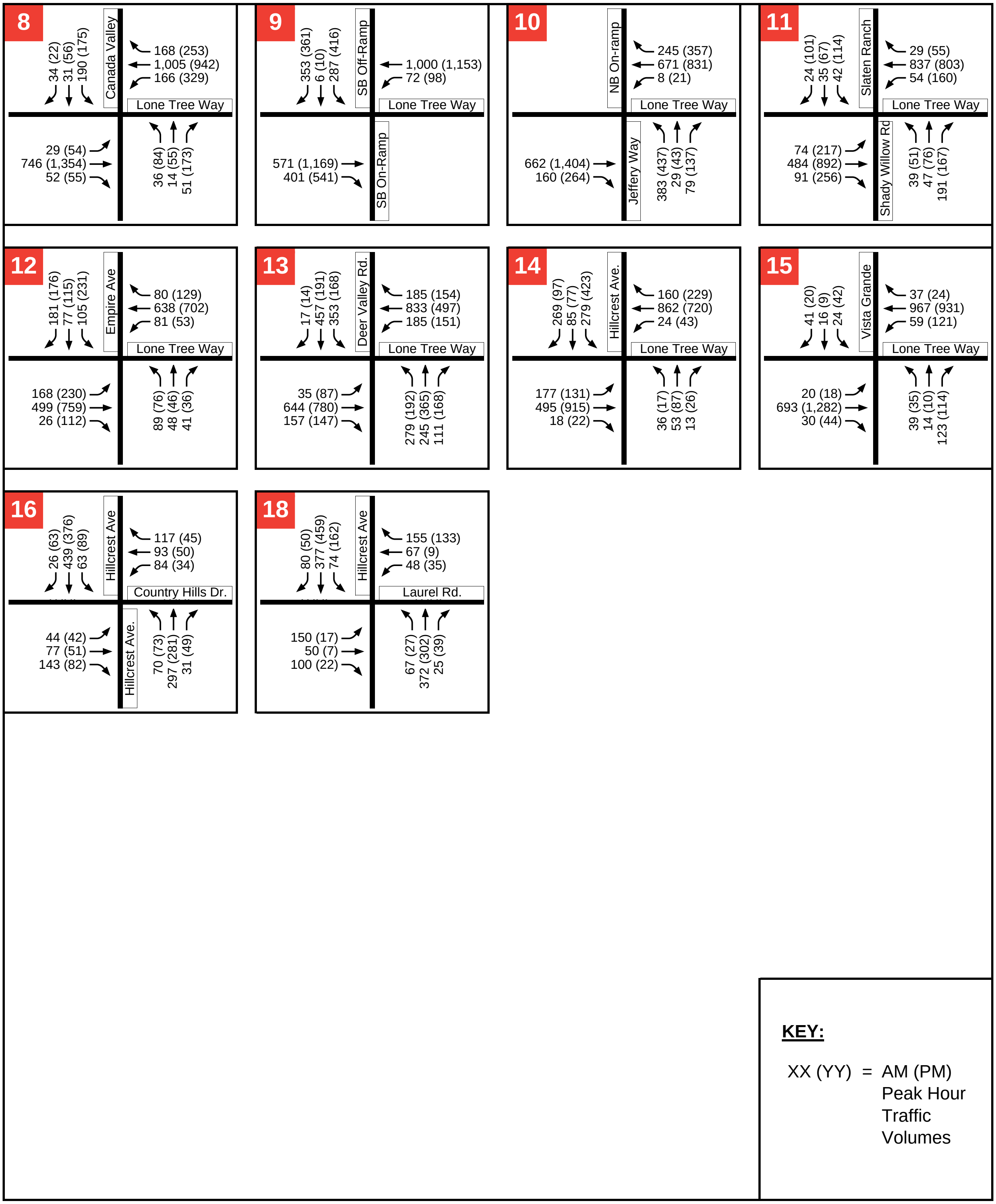
October 2007
Graphics\Oct07 Update\WC05-2153_2

SITE PLAN
FIGURE 2



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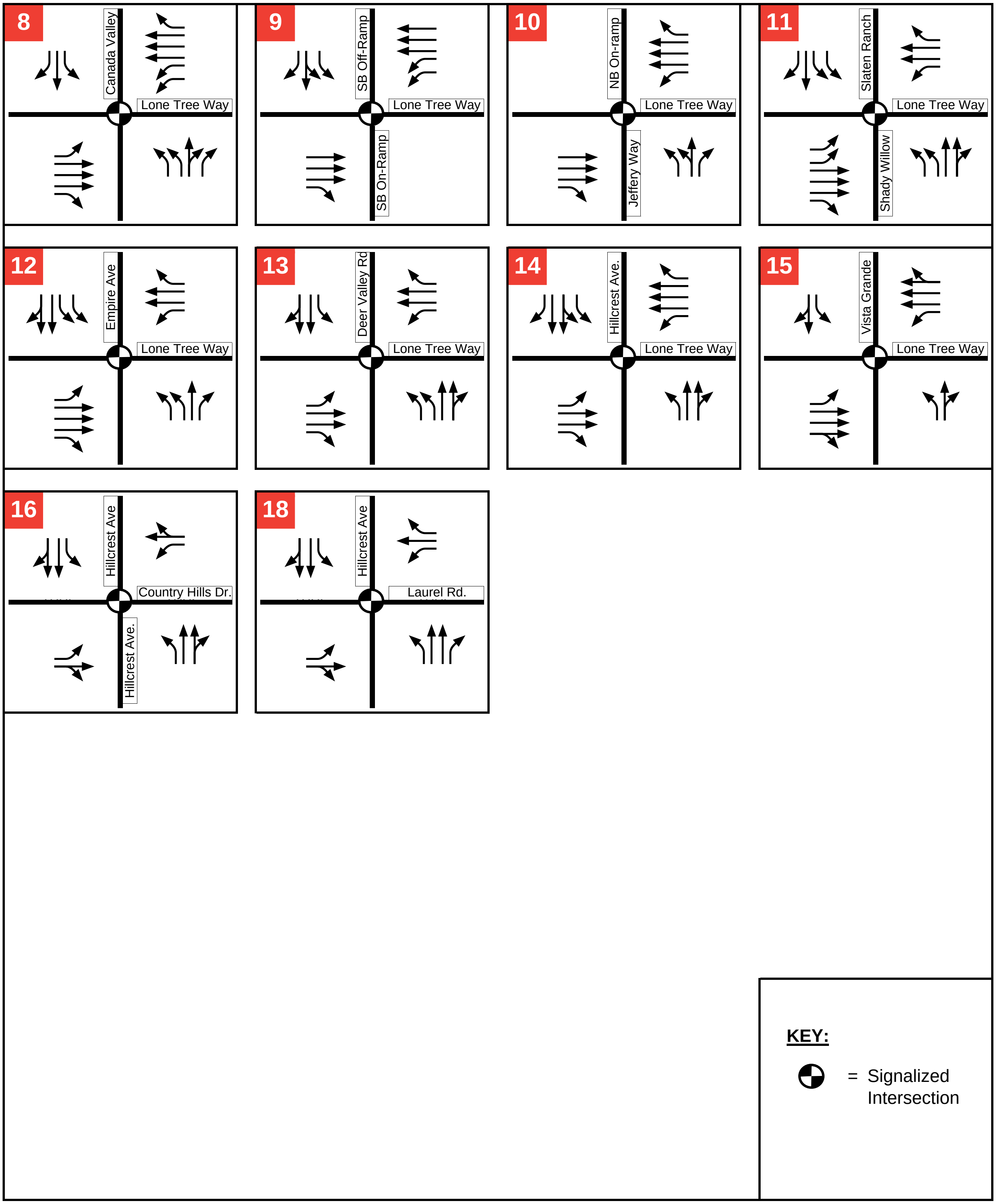
Davidon Homes Transportation Analysis

EXISTING CONDITIONS
PEAK HOUR TURNING MOVEMENTS

FIGURE 3

November 2008
Graphics\Nov08 Update\WC05-2153_3



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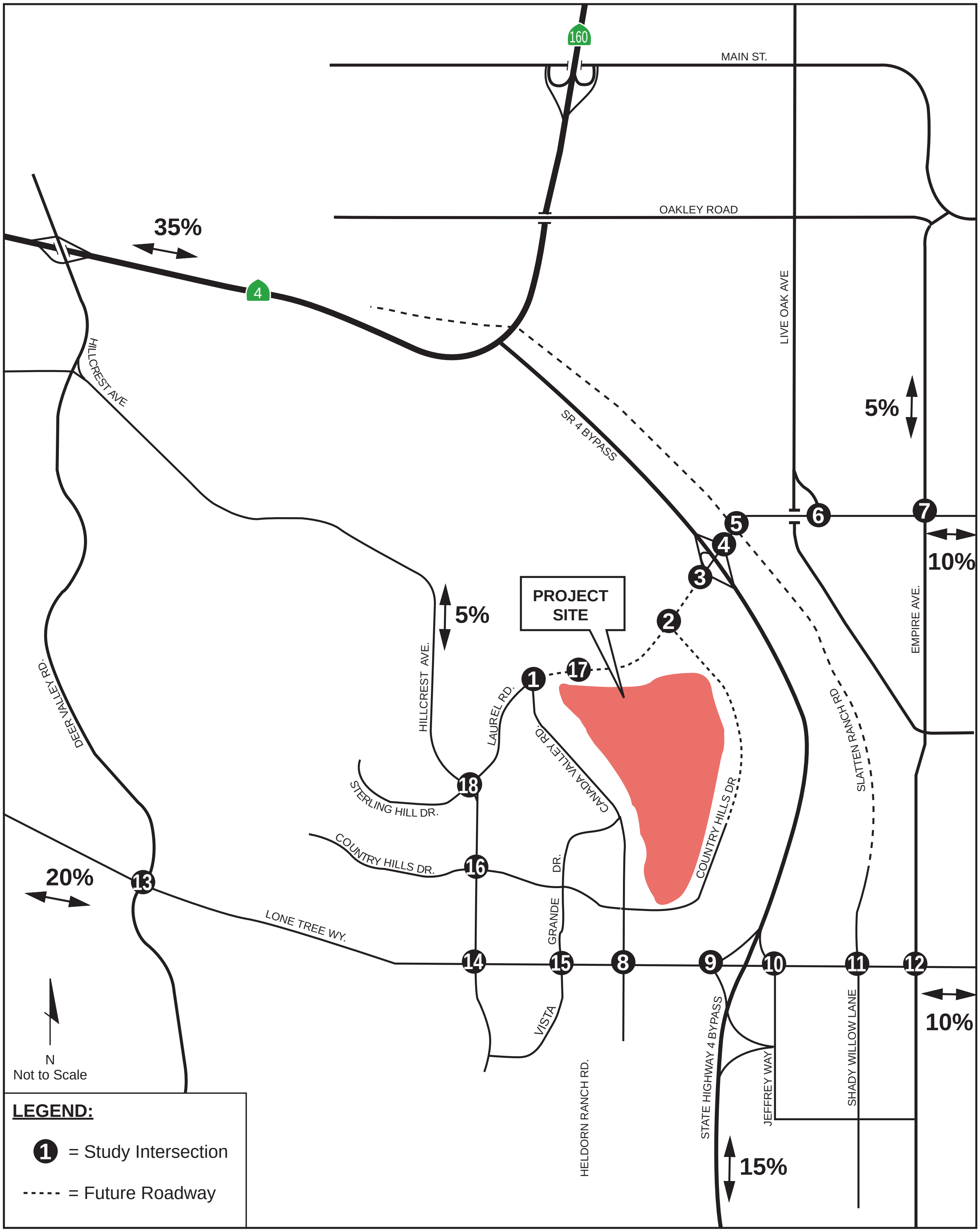
Davidon Homes Transportation Analysis

EXISTING CONDITIONS
LANE CONFIGURATIONS AND TRAFFIC CONTROL

November 2008
Graphics\Nov08 Update\WC05-2153_4

FIGURE 4



Davidon Homes Transportation Analysis

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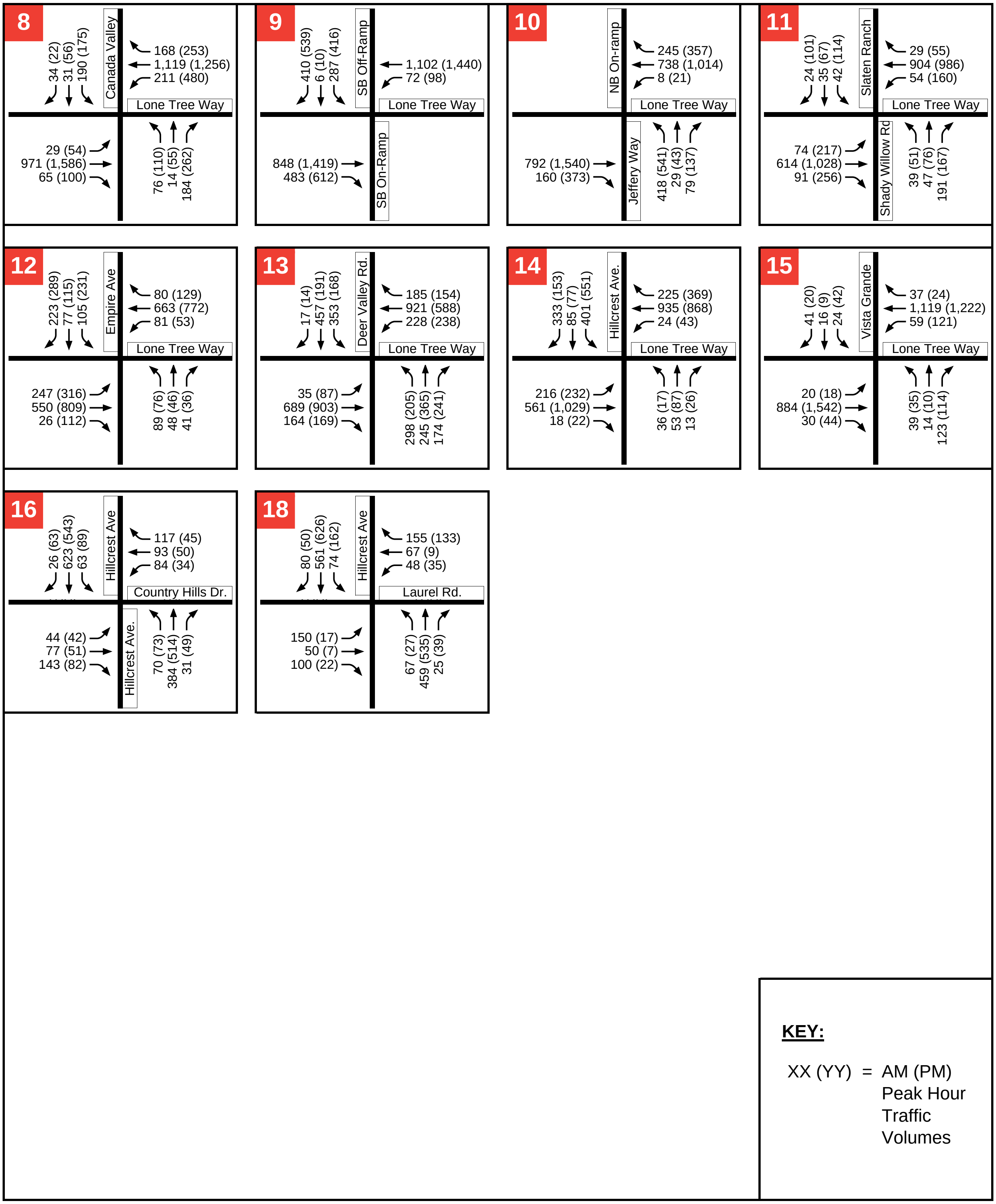
TRIP DISTRIBUTION

November 2008
Graphics\Nov08 Update\WC05-2153_5

FIGURE 5



Davidon Homes Transportation Analysis

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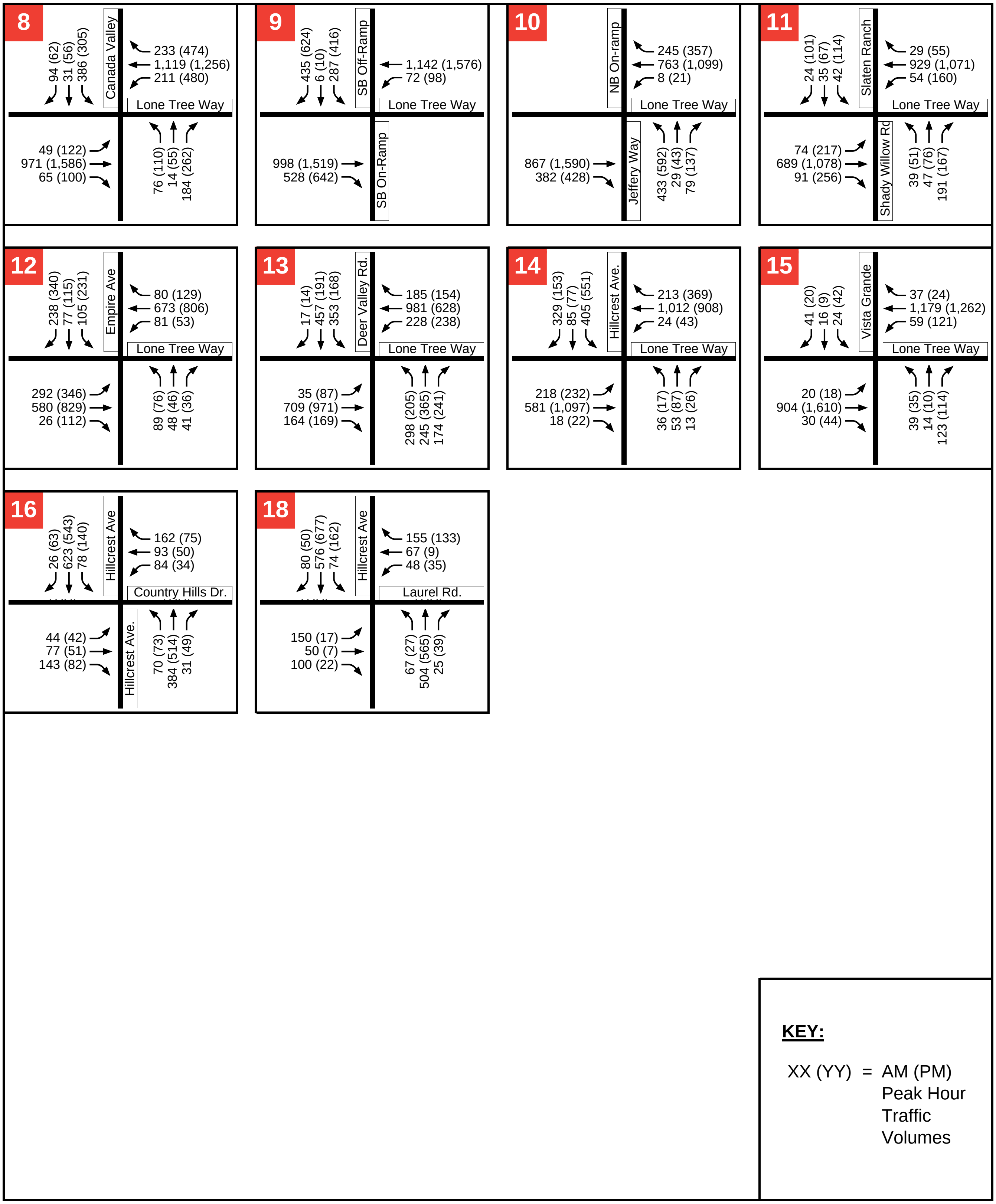
NEAR-TERM NO PROJECT PEAK HOUR TURNING MOVEMENTS

FIGURE 6

November 2008
Graphics\Nov08 Update\WC05-2153_6



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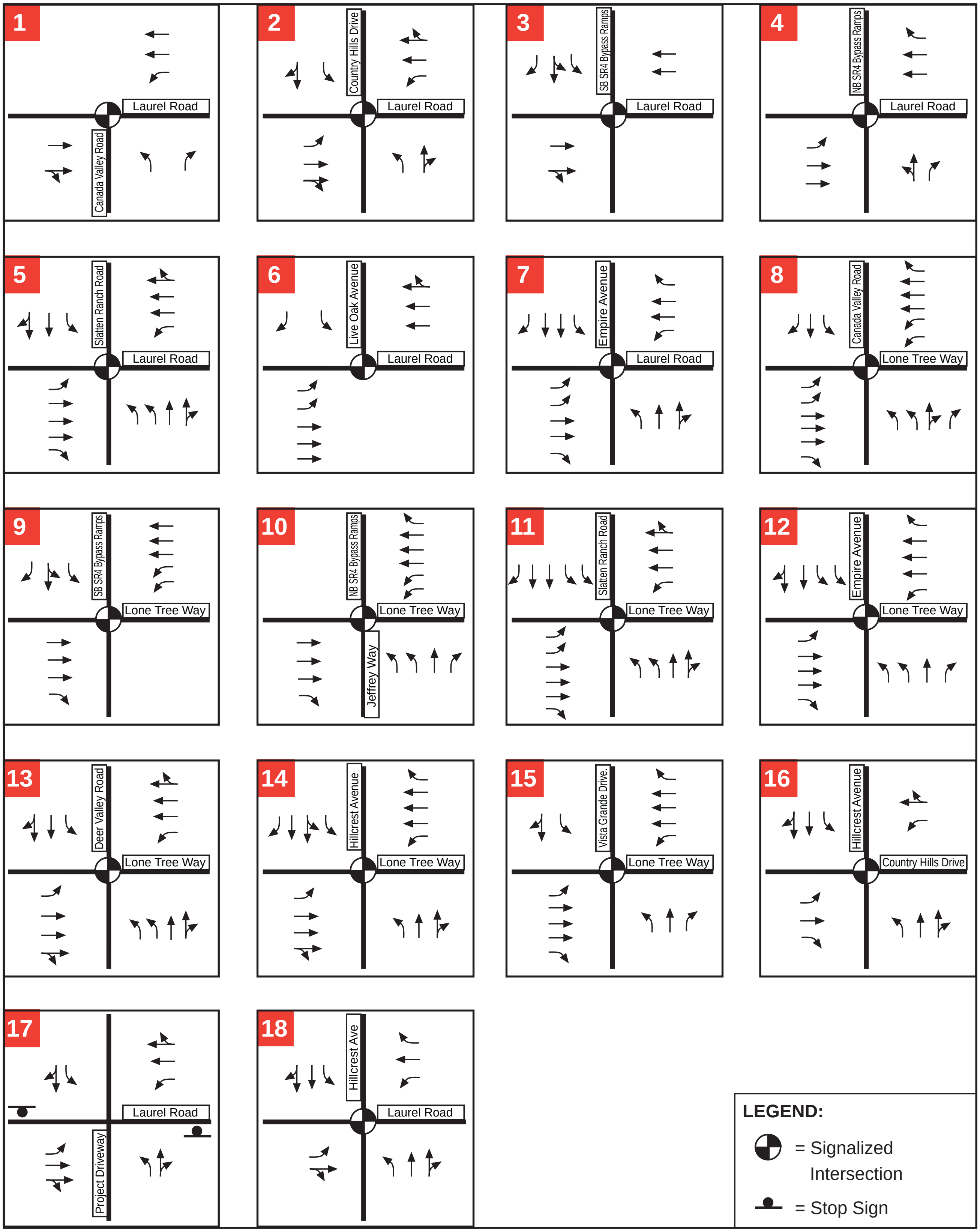
Davidon Homes Transportation Analysis

NEAR-TERM WITH PROJECT PEAK HOUR TURNING MOVEMENTS

FIGURE 7

November 2008
Graphics\Nov08 Update\WC05-2153_7



Davidon Homes Transportation Analysis

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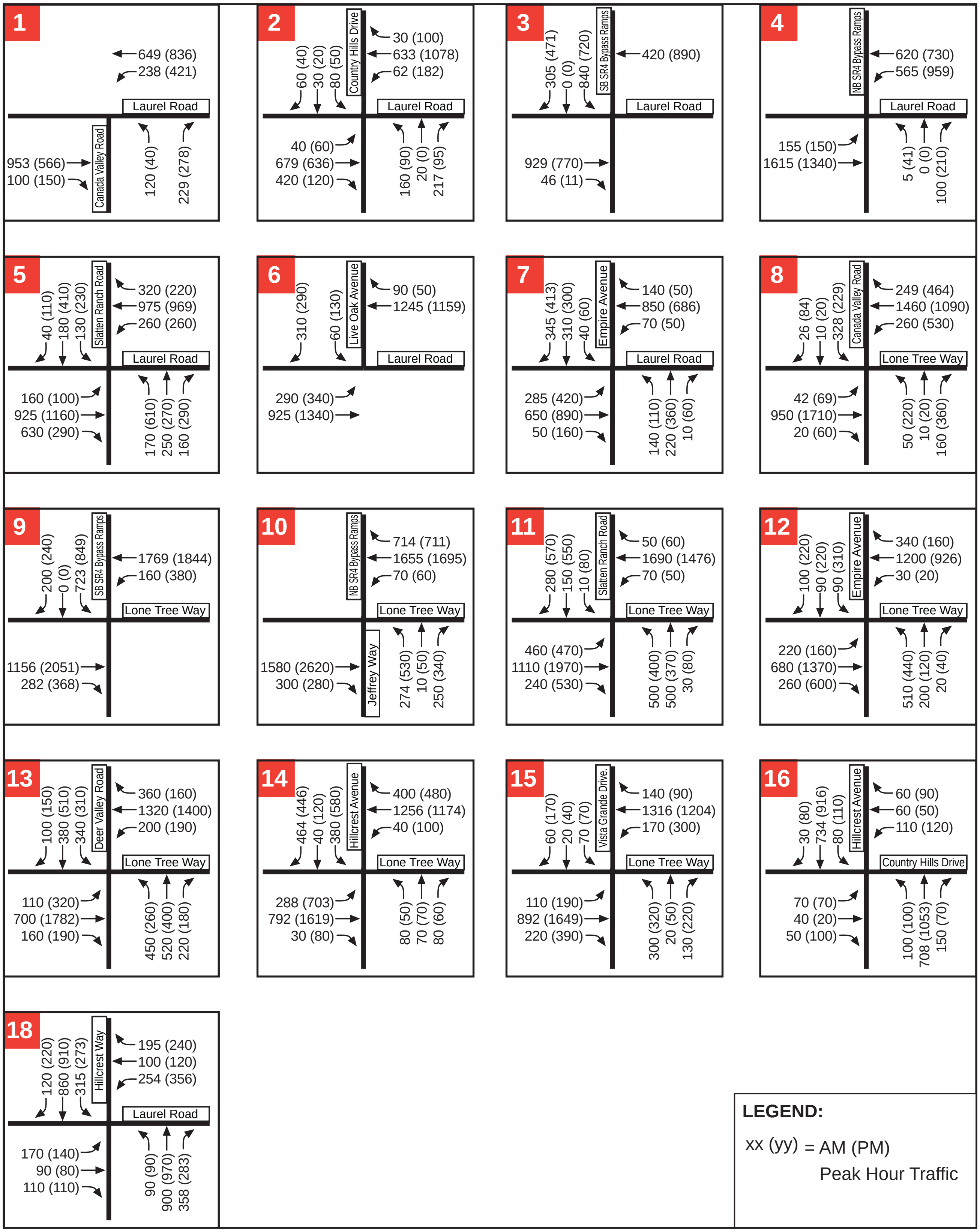
YEAR 2025
LANE GEOMETRIES AND TRAFFIC CONTROL

November 2008
Graphics\Nov08 Update\WC05-2153_8

FIGURE 8



Davidon Homes Transportation Analysis

FEHR & PEERS
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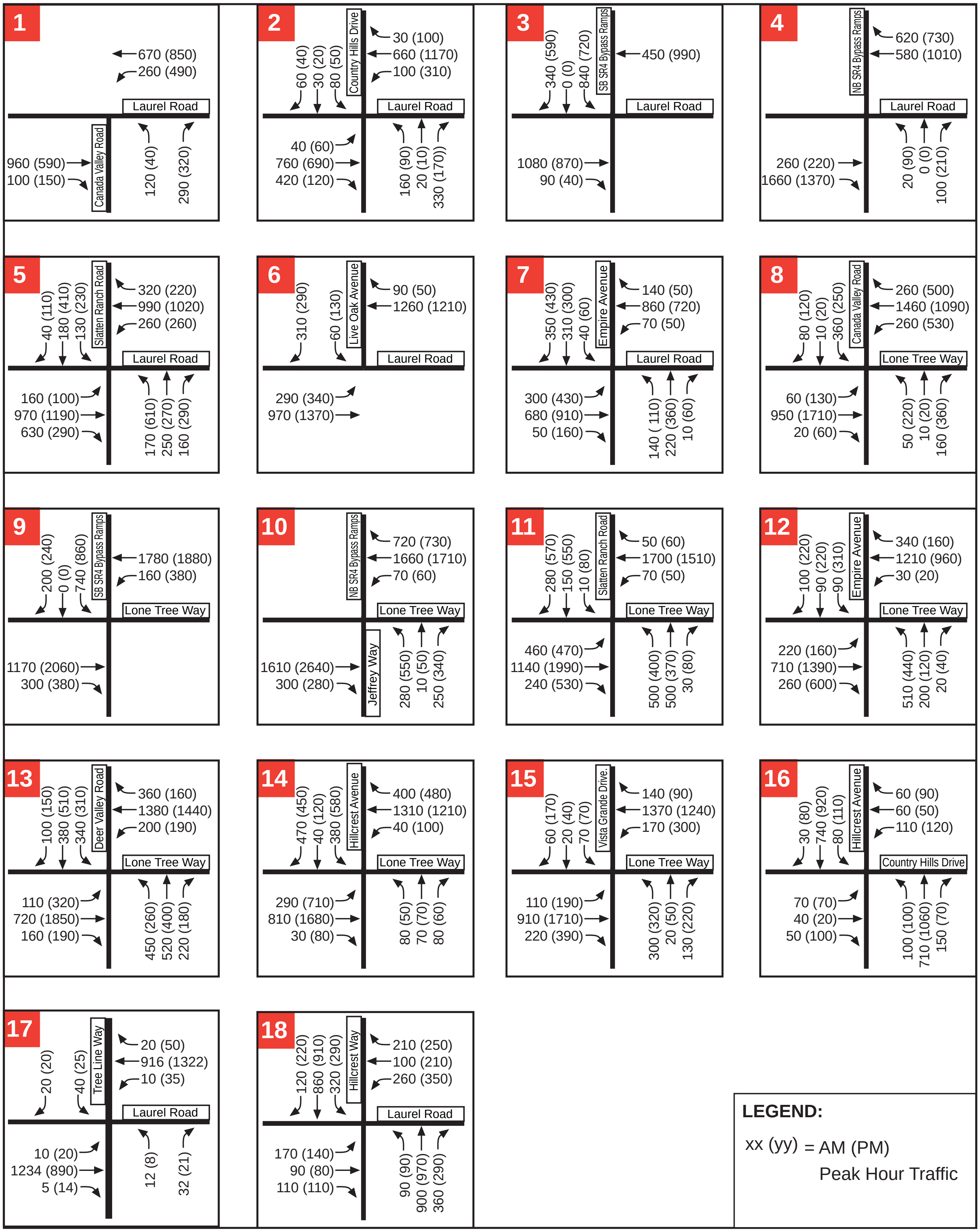
YEAR 2025 NO PROJECT
PEAK HOUR TURNING MOVEMENT

November 2008
Graphics\Nov08 Update\WC05-2153_9

FIGURE 9



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Davidon Homes Transportation Analysis

YEAR 2025 WITH PROJECT
PEAK HOUR TURNING MOVEMENTS

FIGURE 10

November 2008
Graphics\Nov08 Update\WC05-2153_10

APPENDIX A:

Existing Traffic Counts

FEHR & PEERS
TRANSPORTATION CONSULTANTS

WILTEC

Phone: (626) 564-1944 Fax: (626) 564-0969

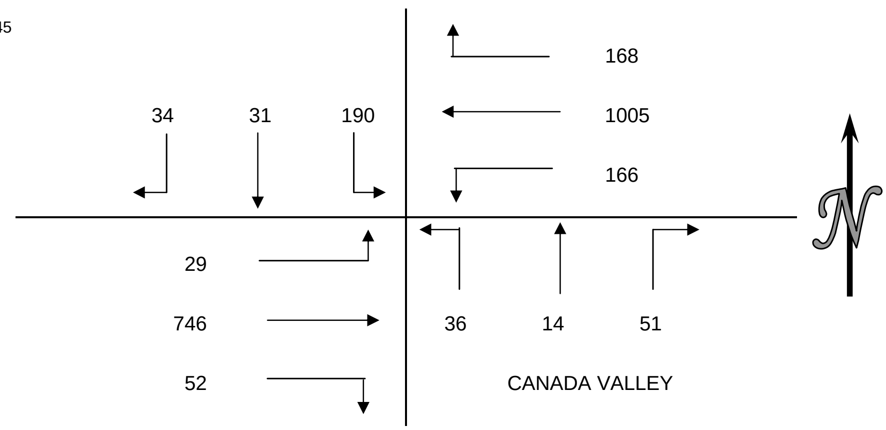
INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT:		KIMLEY -HORN AND ASSOCIATES, INC.
PROJECT:		ANTIOCH TRAFFIC COUNTS
DATE:		THURSDAY MAY 15, 2008
PERIOD"		7:00 AM TO 9:00 AM
INTERSECTION:	N/S	CANADA VALLEY
	E/W	LONE TREE WAY
CITY:		ANTIOCH

VEHICLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
700-715	14	8	33	30	126	23	5	5	7	7	111	4	373
715-730	8	6	37	27	166	25	8	3	7	6	120	1	414
730-745	10	5	44	33	237	37	5	0	7	9	134	4	525
745-800	10	10	61	55	289	32	14	3	4	13	205	3	699
800-815	11	7	57	50	211	38	12	1	6	10	162	10	575
815-830	5	10	41	39	267	69	11	6	10	13	193	9	673
830-845	8	4	31	24	238	27	14	4	16	16	186	7	575
845-900	5	2	48	21	205	71	11	4	16	10	197	4	594
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
700-800	42	29	175	145	818	117	32	11	25	35	570	12	2011
715-815	39	28	199	165	903	132	39	7	24	38	621	18	2213
730-830	36	32	203	177	1004	176	42	10	27	45	694	26	2472
745-845	34	31	190	168	1005	166	51	14	36	52	746	29	2522
800-900	29	23	177	134	921	205	48	15	48	49	738	30	2417

AM PEAK HOUR: 745-845



LONE TREE WAY

PEDESTRIAN COUNTS

15 MIN COUNTS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
700-715	0	3	1	0	4
715-730	0	0	0	0	0
730-745	0	1	0	0	1
745-800	0	0	0	0	0
800-815	0	0	0	0	0
815-830	1	1	0	0	2
830-845	0	0	1	0	1
845-900	0	0	0	0	0
HOUR TOTALS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
700-800	0	4	1	0	5
715-815	0	1	0	0	1
730-830	1	2	0	0	3
745-845	1	1	1	0	3
800-900	1	1	1	0	3

BICYCLE COUNTS

15 MIN COUNTS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
700-715	0	0	1	0	1
715-730	0	0	0	0	0
730-745	0	0	0	0	0
745-800	1	0	1	1	3
800-815	1	0	1	0	2
815-830	1	0	1	0	2
830-845	1	1	2	0	4
845-900	1	1	0	0	2
HOUR TOTALS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
700-800	1	0	2	1	4
715-815	2	0	2	1	5
730-830	3	0	3	1	7
745-845	4	1	5	1	11
800-900	4	2	4	0	10

WILTEC

Phone: (626) 564-1944 Fax: (626) 564-0969

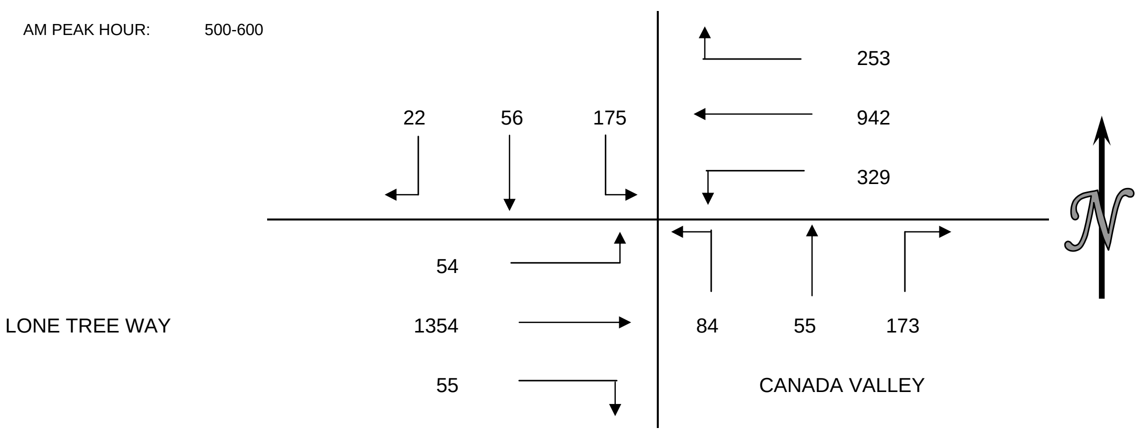
INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT:		KIMLEY -HORN AND ASSOCIATES, INC.
PROJECT:		ANTIOCH TRAFFIC COUNTS
DATE:		THURSDAY MAY 15, 2008
PERIOD"		4:00 PM TO 6:00 PM
INTERSECTION:	N/S	CANADA VALLEY
	E/W	LONE TREE WAY
CITY:		ANTIOCH

VEHICLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
400-415	9	11	51	58	252	66	41	18	20	14	329	12	881
415-430	9	13	40	41	255	57	29	20	15	10	323	12	824
430-445	11	11	49	42	245	69	34	10	21	10	300	9	811
445-500	9	14	64	55	235	79	50	8	19	20	344	7	904
500-515	7	15	42	52	234	92	22	15	10	14	310	15	828
515-530	6	20	45	76	222	77	55	12	20	16	371	8	928
530-545	4	13	46	49	227	74	36	12	26	15	360	17	879
545-600	5	8	42	76	259	86	60	16	28	10	313	14	917
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
400-500	38	49	204	196	987	271	154	56	75	54	1296	40	3420
415-515	36	53	195	190	969	297	135	53	65	54	1277	43	3367
430-530	33	60	200	225	936	317	161	45	70	60	1325	39	3471
445-545	26	62	197	232	918	322	163	47	75	65	1385	47	3539
500-600	22	56	175	253	942	329	173	55	84	55	1354	54	3552

AM PEAK HOUR: 500-600



PEDESTRIAN COUNTS

15 MIN COUNTS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
400-415	2	0	0	4	6
415-430	2	0	2	1	5
430-445	0	3	2	0	5
445-500	1	0	0	0	1
500-515	1	2	0	0	3
515-530	0	0	2	1	3
530-545	0	0	2	0	2
545-600	1	0	6	0	7
HOUR TOTALS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
400-500	5	3	4	5	17
415-515	4	5	4	1	14
430-530	2	5	4	1	12
445-545	2	2	4	1	9
500-600	2	2	10	1	15

BICYCLE COUNTS

15 MIN COUNTS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
400-415	0	0	0	0	0
415-430	0	0	0	0	0
430-445	0	0	0	0	0
445-500	0	0	0	1	1
500-515	0	0	2	0	2
515-530	0	0	0	0	0
530-545	0	0	2	0	2
545-600	0	0	0	0	0
HOUR TOTALS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
400-500	0	0	0	1	1
415-515	0	0	2	1	3
430-530	0	0	2	1	3
445-545	0	0	4	1	5
500-600	0	0	4	0	4

WILTEC

Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

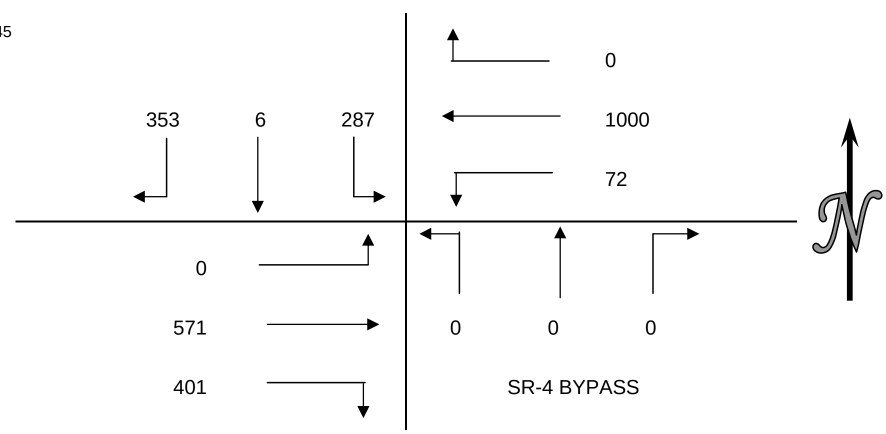
CLIENT:		KIMLEY -HORN AND ASSOCIATES, INC.
PROJECT:		ANTIOCH TRAFFIC COUNTS
DATE:		THURSDAY MAY 15, 2008
PERIOD"		7:00 AM TO 9:00 AM
INTERSECTION:	N/S	SR-4 BYPASS
	E/W	LONE TREE WAY
CITY:		ANTIOCH

VEHICLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
700-715	33	1	35	0	131	13	0	0	0	60	56	0	329
715-730	57	1	41	0	187	21	0	0	0	114	84	0	505
730-745	89	1	54	0	202	13	0	0	0	81	101	0	541
745-800	106	3	81	0	261	23	0	0	0	100	170	0	744
800-815	84	0	78	0	255	18	0	0	0	103	152	0	690
815-830	95	1	65	0	267	11	0	0	0	93	111	0	643
830-845	68	2	63	0	217	20	0	0	0	105	138	0	613
845-900	75	0	56	0	237	9	0	0	0	116	136	0	629
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
700-800	285	6	211	0	781	70	0	0	0	355	411	0	2119
715-815	336	5	254	0	905	75	0	0	0	398	507	0	2480
730-830	374	5	278	0	985	65	0	0	0	377	534	0	2618
745-845	353	6	287	0	1000	72	0	0	0	401	571	0	2690
800-900	322	3	262	0	976	58	0	0	0	417	537	0	2575

AM PEAK HOUR: 745-845

LONE TREE WAY



PEDESTRIAN COUNTS

15 MIN COUNTS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
700-715	0	0	1	0	1
715-730	0	0	0	0	0
730-745	0	0	0	0	0
745-800	0	0	0	0	0
800-815	1	0	0	0	1
815-830	0	0	0	0	0
830-845	1	0	0	0	1
845-900	0	0	0	0	0
HOUR TOTALS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
700-800	0	0	1	0	1
715-815	1	0	0	0	1
730-830	1	0	0	0	1
745-845	2	0	0	0	2
800-900	2	0	0	0	2

BICYCLE COUNTS

15 MIN COUNTS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
700-715	0	0	0	0	0
715-730	0	0	0	0	0
730-745	1	0	0	0	1
745-800	1	0	0	0	1
800-815	1	0	1	0	2
815-830	0	0	1	0	1
830-845	1	0	0	0	1
845-900	2	0	0	0	2
HOUR TOTALS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
700-800	2	0	0	0	2
715-815	3	0	1	0	4
730-830	3	0	2	0	5
745-845	3	0	2	0	5
800-900	4	0	2	0	6

WILTEC

Phone: (626) 564-1944 Fax: (626) 564-0969

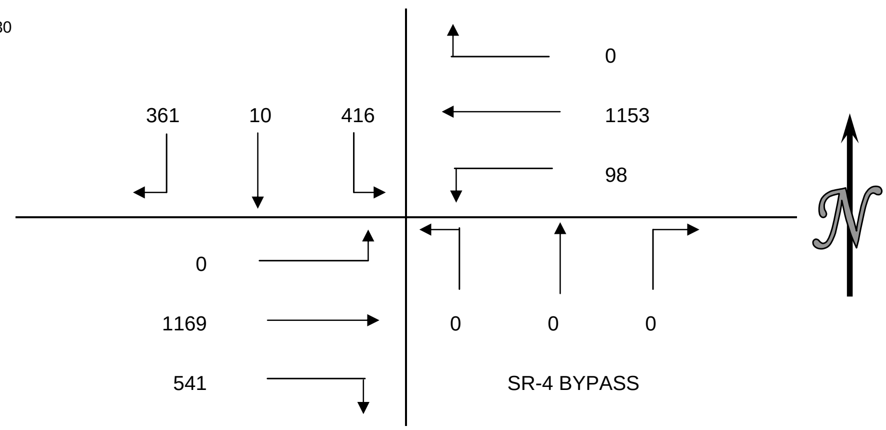
INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT:		KIMLEY -HORN AND ASSOCIATES, INC.
PROJECT:		ANTIOCH TRAFFIC COUNTS
DATE:		THURSDAY MAY 15, 2008
PERIOD"		4:00 PM TO 6:00 PM
INTERSECTION:	N/S	SR-4 BYPASS
	E/W	LONE TREE WAY
CITY:		ANTIOCH

VEHICLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
400-415	84	2	80	0	322	35	0	0	0	129	285	0	937
415-430	83	3	125	0	280	35	0	0	0	141	266	0	933
430-445	88	0	109	0	300	33	0	0	0	111	245	0	886
445-500	84	4	102	0	260	18	0	0	0	156	306	0	930
500-515	97	3	122	0	289	22	0	0	0	125	287	0	945
515-530	92	3	83	0	304	25	0	0	0	149	331	0	987
530-545	97	3	93	0	261	35	0	0	0	102	293	0	884
545-600	88	1	113	0	330	31	0	0	0	91	270	0	924
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
400-500	339	9	416	0	1162	121	0	0	0	537	1102	0	3686
415-515	352	10	458	0	1129	108	0	0	0	533	1104	0	3694
430-530	361	10	416	0	1153	98	0	0	0	541	1169	0	3748
445-545	370	13	400	0	1114	100	0	0	0	532	1217	0	3746
500-600	374	10	411	0	1184	113	0	0	0	467	1181	0	3740

AM PEAK HOUR: 430-530



LONE TREE WAY

PEDESTRIAN COUNTS

15 MIN COUNTS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
400-415	4	1	0	0	5
415-430	0	0	0	0	0
430-445	0	0	0	0	0
445-500	2	0	1	0	3
500-515	0	0	0	0	0
515-530	0	0	0	0	0
530-545	4	0	1	0	5
545-600	1	0	1	0	2
HOUR TOTALS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
400-500	6	1	1	0	8
415-515	2	0	1	0	3
430-530	2	0	1	0	3
445-545	6	0	2	0	8
500-600	5	0	2	0	7

BICYCLE COUNTS

15 MIN COUNTS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
400-415	0	0	0	0	0
415-430	0	0	0	0	0
430-445	0	0	0	0	0
445-500	0	0	1	0	1
500-515	0	0	0	0	0
515-530	0	0	0	0	0
530-545	0	0	2	0	2
545-600	0	0	1	0	1
HOUR TOTALS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
400-500	0	0	1	0	1
415-515	0	0	1	0	1
430-530	0	0	1	0	1
445-545	0	0	3	0	3
500-600	0	0	3	0	3

WILTEC

Phone: (626) 564-1944 Fax: (626) 564-0969

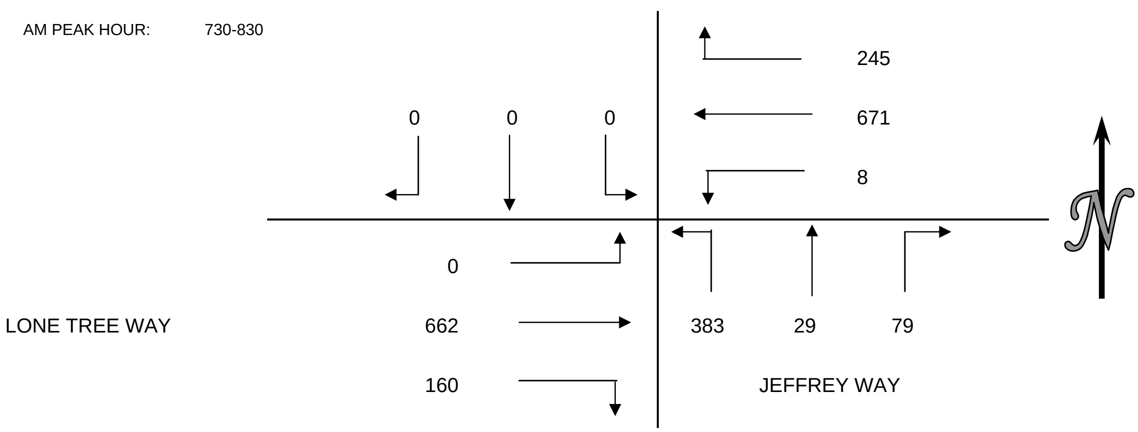
INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT:		KIMLEY -HORN AND ASSOCIATES, INC.
PROJECT:		ANTIOCH TRAFFIC COUNTS
DATE:		TUESDAY MAY 13, 2008
PERIOD"		7:00 AM TO 9:00 AM
INTERSECTION:	N/S	JEFFREY WAY
	E/W	LONE TREE WAY
CITY:		ANTIOCH

VEHICLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
700-715	0	0	0	63	134	4	9	5	64	29	92	0	400
715-730	0	0	0	55	146	1	12	7	84	40	118	0	463
730-745	0	0	0	62	184	2	12	9	94	61	141	0	565
745-800	0	0	0	67	159	2	27	6	97	39	183	0	580
800-815	0	0	0	72	183	2	21	10	107	39	191	0	625
815-830	0	0	0	44	145	2	19	4	85	21	147	0	467
830-845	0	0	0	33	132	2	11	1	69	23	138	0	409
845-900	0	0	0	53	128	2	11	7	89	32	141	0	463
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
700-800	0	0	0	247	623	9	60	27	339	169	534	0	2008
715-815	0	0	0	256	672	7	72	32	382	179	633	0	2233
730-830	0	0	0	245	671	8	79	29	383	160	662	0	2237
745-845	0	0	0	216	619	8	78	21	358	122	659	0	2081
800-900	0	0	0	202	588	8	62	22	350	115	617	0	1964

AM PEAK HOUR: 730-830



PEDESTRIAN COUNTS

15 MIN COUNTS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
700-715	0	0	0	0	0
715-730	0	0	0	0	0
730-745	0	0	0	0	0
745-800	0	0	0	0	0
800-815	0	0	0	0	0
815-830	1	0	0	0	1
830-845	1	0	0	0	1
845-900	0	1	0	0	1
HOUR TOTALS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
700-800	0	0	0	0	0
715-815	0	0	0	0	0
730-830	1	0	0	0	1
745-845	2	0	0	0	2
800-900	2	1	0	0	3

BICYCLE COUNTS

15 MIN COUNTS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
700-715	0	0	1	0	1
715-730	0	0	0	0	0
730-745	1	0	0	0	1
745-800	1	0	0	0	1
800-815	1	0	1	0	2
815-830	1	0	1	0	2
830-845	0	0	0	0	0
845-900	3	0	1	0	4
HOUR TOTALS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
700-800	2	0	1	0	3
715-815	3	0	1	0	4
730-830	4	0	2	0	6
745-845	3	0	2	0	5
800-900	5	0	3	0	8

WILTEC

Phone: (626) 564-1944 Fax: (626) 564-0969

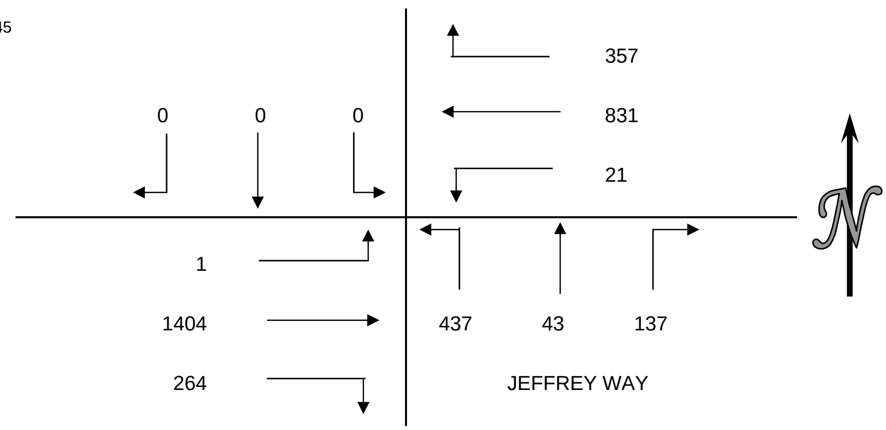
INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT:		KIMLEY -HORN AND ASSOCIATES, INC.
PROJECT:		ANTIOCH TRAFFIC COUNTS
DATE:		TUESDAY MAY 13, 2008
PERIOD"		4:00 PM TO 6:00 PM
INTERSECTION:	N/S	JEFFREY WAY
	E/W	LONE TREE WAY
CITY:		ANTIOCH

VEHICLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
400-415	0	0	0	66	215	4	24	6	125	63	359	0	862
415-430	0	0	0	85	226	9	21	10	116	63	355	1	886
430-445	0	0	0	70	207	9	20	9	87	71	307	0	780
445-500	0	0	0	78	199	6	36	15	104	72	331	0	841
500-515	0	0	0	100	236	3	45	10	135	61	368	0	958
515-530	0	0	0	79	191	8	25	8	96	58	336	1	802
530-545	0	0	0	100	205	4	31	10	102	73	369	0	894
545-600	0	0	0	95	183	6	35	8	108	51	350	0	836
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
400-500	0	0	0	299	847	28	101	40	432	269	1352	1	3369
415-515	0	0	0	333	868	27	122	44	442	267	1361	1	3465
430-530	0	0	0	327	833	26	126	42	422	262	1342	1	3381
445-545	0	0	0	357	831	21	137	43	437	264	1404	1	3495
500-600	0	0	0	374	815	21	136	36	441	243	1423	1	3490

AM PEAK HOUR: 445-545



LONE TREE WAY

PEDESTRIAN COUNTS

15 MIN COUNTS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
400-415	3	0	0	0	3
415-430	1	0	0	0	1
430-445	0	0	1	0	1
445-500	1	1	0	0	2
500-515	1	0	0	0	1
515-530	0	0	1	0	1
530-545	0	0	1	0	1
545-600	5	0	0	0	5
HOUR TOTALS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
400-500	5	1	1	0	7
415-515	3	1	1	0	5
430-530	2	1	2	0	5
445-545	2	1	2	0	5
500-600	6	0	2	0	8

BICYCLE COUNTS

15 MIN COUNTS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
400-415	0	0	0	0	0
415-430	0	0	0	0	0
430-445	1	0	0	0	1
445-500	0	0	3	0	3
500-515	0	0	0	0	0
515-530	0	0	0	0	0
530-545	0	0	0	0	0
545-600	0	0	1	0	1
HOUR TOTALS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
400-500	1	0	3	0	4
415-515	1	0	3	0	4
430-530	1	0	3	0	4
445-545	0	0	3	0	3
500-600	0	0	1	0	1

WILTEC

Phone: (626) 564-1944 Fax: (626) 564-0969

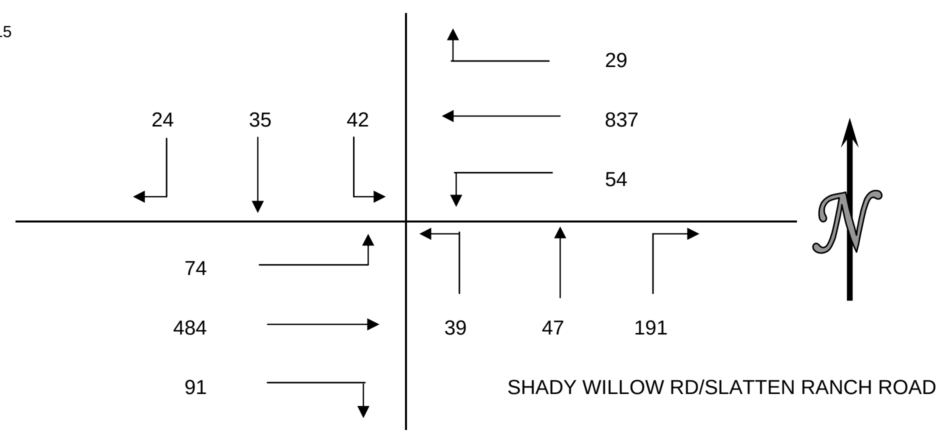
INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT:		KIMLEY -HORN AND ASSOCIATES, INC.
PROJECT:		ANTIOCH TRAFFIC COUNTS
DATE:		THURSDAY MAY 22, 2008
PERIOD"		7:00 AM TO 9:00 AM
INTERSECTION:	N/S	SHADY WILLOW RD/SLATTEN RANCH ROAD
	E/W	LONE TREE WAY
CITY:		ANTIOCH

VEHICLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
700-715	9	5	11	3	200	3	34	5	15	14	90	7	396
715-730	8	3	13	4	194	16	52	13	12	35	133	19	502
730-745	4	8	6	5	199	14	49	10	19	27	111	25	477
745-800	7	14	13	10	231	9	62	17	3	17	137	19	539
800-815	5	10	10	10	213	15	28	7	5	12	103	11	429
815-830	11	5	13	5	167	10	30	5	8	18	122	19	413
830-845	7	3	13	6	158	14	27	16	5	12	95	24	380
845-900	14	3	12	8	207	9	25	11	4	13	106	36	448
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
700-800	28	30	43	22	824	42	197	45	49	93	471	70	1914
715-815	24	35	42	29	837	54	191	47	39	91	484	74	1947
730-830	27	37	42	30	810	48	169	39	35	74	473	74	1858
745-845	30	32	49	31	769	48	147	45	21	59	457	73	1761
800-900	37	21	48	29	745	48	110	39	22	55	426	90	1670

AM PEAK HOUR: 715-815



LONE TREE WAY

PEDESTRIAN COUNTS

15 MIN COUNTS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
700-715	0	0	0	0	0
715-730	0	0	0	0	0
730-745	0	0	0	0	0
745-800	0	2	2	0	4
800-815	2	0	0	2	4
815-830	0	0	1	0	1
830-845	0	0	0	0	0
845-900	0	0	1	1	2
HOUR TOTALS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
700-800	0	2	2	0	4
715-815	2	2	2	2	8
730-830	2	2	3	2	9
745-845	2	2	3	2	9
800-900	2	0	2	3	7

BICYCLE COUNTS

15 MIN COUNTS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
700-715	1	0	0	0	1
715-730	0	0	0	0	0
730-745	0	0	1	0	1
745-800	0	0	0	0	0
800-815	0	0	0	1	1
815-830	0	0	0	0	0
830-845	0	0	2	0	2
845-900	0	0	0	0	0
HOUR TOTALS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
700-800	1	0	1	0	2
715-815	0	0	1	1	2
730-830	0	0	1	1	2
745-845	0	0	2	1	3
800-900	0	0	2	1	3

WILTEC Phone: (626) 564-1944 Fax: (626) 564-0969

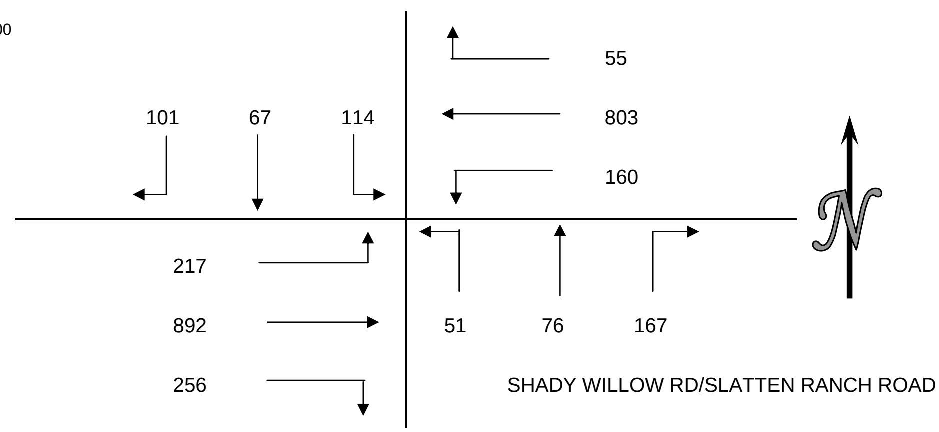
INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT:		KIMLEY -HORN AND ASSOCIATES, INC.
PROJECT:		ANTIOCH TRAFFIC COUNTS
DATE:		THURSDAY MAY 22, 2008
PERIOD"		4:00 PM TO 6:00 PM
INTERSECTION:	N/S	SHADY WILLOW RD/SLATTEN RANCH ROAD
	E/W	LONE TREE WAY
CITY:		ANTIOCH

VEHICLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
400-415	34	22	39	3	229	8	36	16	10	71	226	35	729
415-430	21	19	32	6	215	26	41	13	10	48	213	25	669
430-445	28	19	30	6	199	22	38	14	13	38	215	32	654
445-500	32	12	27	4	235	31	46	23	18	63	213	39	743
500-515	26	19	17	5	206	32	44	20	12	80	226	41	728
515-530	29	11	29	15	187	25	46	17	10	55	195	50	669
530-545	27	20	30	15	207	41	44	16	10	60	236	70	776
545-600	19	17	38	20	203	62	33	23	19	61	235	56	786
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
400-500	115	72	128	19	878	87	161	66	51	220	867	131	2795
415-515	107	69	106	21	855	111	169	70	53	229	867	137	2794
430-530	115	61	103	30	827	110	174	74	53	236	849	162	2794
445-545	114	62	103	39	835	129	180	76	50	258	870	200	2916
500-600	101	67	114	55	803	160	167	76	51	256	892	217	2959

AM PEAK HOUR: 500-600



LONE TREE WAY

PEDESTRIAN COUNTS

15 MIN COUNTS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
400-415	0	0	1	0	1
415-430	0	1	0	0	1
430-445	0	1	3	0	4
445-500	0	1	0	0	1
500-515	0	6	6	3	15
515-530	0	0	0	0	0
530-545	0	0	1	0	1
545-600	2	5	0	0	7
HOUR TOTALS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
400-500	0	3	4	0	7
415-515	0	9	9	3	21
430-530	0	8	9	3	20
445-545	0	7	7	3	17
500-600	2	11	7	3	23

BICYCLE COUNTS

15 MIN COUNTS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
400-415	2	0	0	0	2
415-430	0	1	0	0	1
430-445	0	0	1	0	1
445-500	1	1	0	1	3
500-515	0	0	0	0	0
515-530	0	1	0	1	2
530-545	0	1	0	1	2
545-600	0	0	2	0	2
HOUR TOTALS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
400-500	3	2	1	1	7
415-515	1	2	1	1	5
430-530	1	2	1	2	6
445-545	1	3	0	3	7
500-600	0	2	2	2	6

WILTEC

Phone: (626) 564-1944 Fax: (626) 564-0969

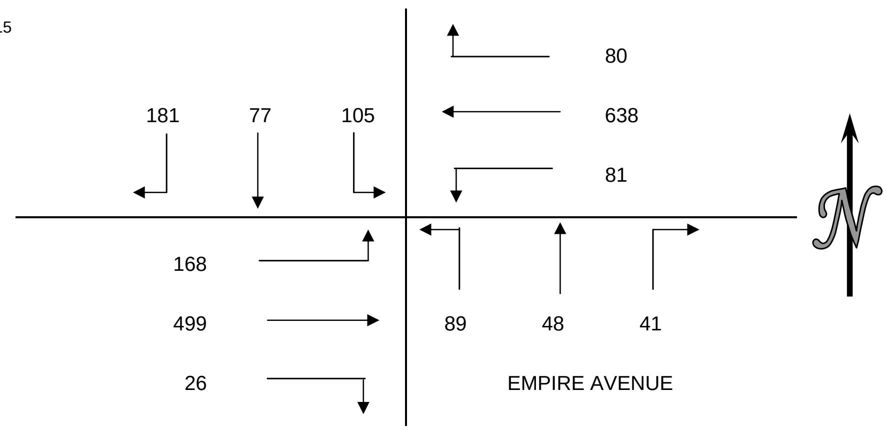
INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT:		KIMLEY -HORN AND ASSOCIATES, INC.
PROJECT:		ANTIOCH TRAFFIC COUNTS
DATE:		THURSDAY MAY 22, 2008
PERIOD"		7:00 AM TO 9:00 AM
INTERSECTION:	N/S	EMPIRE AVENUE
	E/W	LONE TREE WAY
CITY:		ANTIOCH

VEHICLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
700-715	29	16	27	21	128	17	8	8	18	6	102	38	418
715-730	36	21	33	28	168	28	12	16	31	6	123	63	565
730-745	46	19	30	21	149	23	13	13	23	11	145	36	529
745-800	50	18	13	17	168	19	14	14	19	6	125	31	494
800-815	49	19	29	14	153	11	2	5	16	3	106	38	445
815-830	42	15	24	19	139	15	3	12	18	10	120	41	458
830-845	31	27	30	10	122	15	5	9	19	18	112	41	439
845-900	42	23	26	14	134	15	3	4	15	10	99	31	416
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
700-800	161	74	103	87	613	87	47	51	91	29	495	168	2006
715-815	181	77	105	80	638	81	41	48	89	26	499	168	2033
730-830	187	71	96	71	609	68	32	44	76	30	496	146	1926
745-845	172	79	96	60	582	60	24	40	72	37	463	151	1836
800-900	164	84	109	57	548	56	13	30	68	41	437	151	1758

AM PEAK HOUR: 715-815



LONE TREE WAY

PEDESTRIAN COUNTS

15 MIN COUNTS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
700-715	1	0	2	0	3
715-730	1	1	1	0	3
730-745	0	0	0	0	0
745-800	0	0	0	0	0
800-815	3	0	2	0	5
815-830	0	0	5	4	9
830-845	0	0	7	3	10
845-900	0	0	0	2	2
HOUR TOTALS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
700-800	2	1	3	0	6
715-815	4	1	3	0	8
730-830	3	0	3	4	7
745-845	3	0	4	7	14
800-900	3	0	4	9	16

BICYCLE COUNTS

15 MIN COUNTS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
700-715	1	0	0	0	1
715-730	0	0	0	0	0
730-745	0	0	0	0	0
745-800	0	0	0	0	0
800-815	2	0	0	0	2
815-830	0	0	0	0	0
830-845	0	0	1	1	2
845-900	0	0	0	0	0
HOUR TOTALS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
700-800	1	0	0	0	1
715-815	2	0	0	0	2
730-830	2	0	0	0	2
745-845	2	0	1	1	4
800-900	2	0	1	1	4

WILTEC Phone: (626) 564-1944 Fax: (626) 564-0969

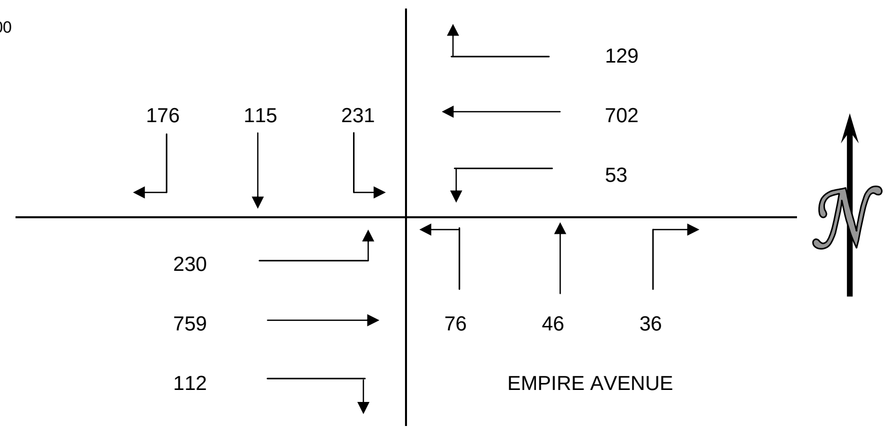
INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT:		KIMLEY -HORN AND ASSOCIATES, INC.
PROJECT:		ANTIOCH TRAFFIC COUNTS
DATE:		THURSDAY MAY 22, 2008
PERIOD"		4:00 PM TO 6:00 PM
INTERSECTION:	N/S	EMPIRE AVENUE
	E/W	LONE TREE WAY
CITY:		ANTIOCH

VEHICLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
400-415	37	29	44	31	152	20	6	14	18	20	212	78	661
415-430	45	34	62	32	134	16	8	10	18	17	198	63	637
430-445	53	30	71	21	180	21	6	6	14	24	173	63	662
445-500	46	26	43	28	169	21	4	14	26	24	197	63	661
500-515	44	27	57	36	179	15	9	17	22	26	172	75	679
515-530	34	33	63	34	177	11	5	6	17	26	180	50	636
530-545	53	28	57	21	179	14	12	11	18	29	212	45	679
545-600	45	27	54	38	167	13	10	12	19	31	195	60	671
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
400-500	181	119	220	112	635	78	24	44	76	85	780	267	2621
415-515	188	117	233	117	662	73	27	47	80	91	740	264	2639
430-530	177	116	234	119	705	68	24	43	79	100	722	251	2638
445-545	177	114	220	119	704	61	30	48	83	105	761	233	2655
500-600	176	115	231	129	702	53	36	46	76	112	759	230	2665

AM PEAK HOUR: 500-600



LONE TREE WAY

PEDESTRIAN COUNTS

15 MIN COUNTS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
400-415	0	0	0	0	0
415-430	1	1	0	0	2
430-445	0	1	0	4	5
445-500	0	4	0	0	4
500-515	0	1	0	0	1
515-530	0	0	0	0	0
530-545	0	1	0	0	1
545-600	0	0	0	0	0
HOUR TOTALS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
400-500	1	6	0	4	11
415-515	1	7	0	4	12
430-530	0	6	0	4	10
445-545	0	6	0	0	6
500-600	0	2	0	0	2

BICYCLE COUNTS

15 MIN COUNTS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
400-415	0	2	0	0	2
415-430	0	1	0	0	1
430-445	0	3	0	0	3
445-500	0	0	0	1	1
500-515	0	0	0	0	0
515-530	0	0	0	0	0
530-545	0	0	0	0	0
545-600	0	0	0	0	0
HOUR TOTALS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
400-500	0	6	0	1	7
415-515	0	4	0	1	5
430-530	0	3	0	1	4
445-545	0	0	0	1	1
500-600	0	0	0	0	0

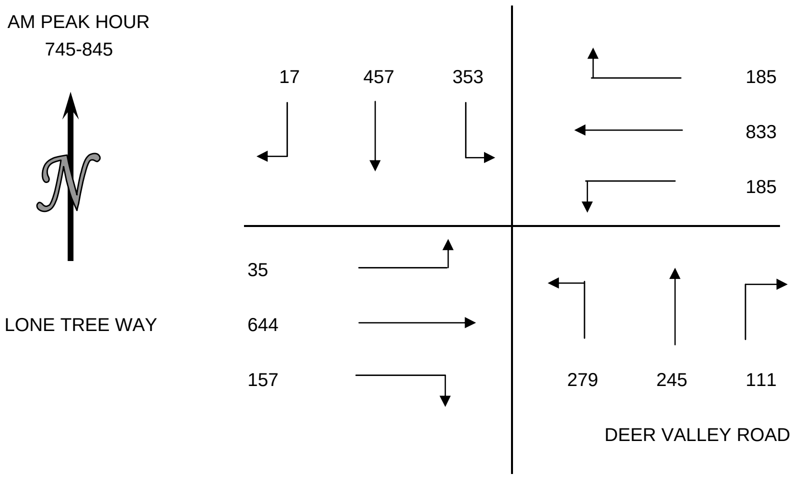
WILTEC

Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: KIMLEY -HORN AND ASSOCIATES, INC.
PROJECT: ANTIOCH TRAFFIC COUNTS
DATE: THURSDAY MAY 15, 2008
PERIOD: 7:00 AM TO 9:00 AM
INTERSECTION: N/S DEER VALLEY ROAD
E/W LONE TREE WAY

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	TOTALS
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	
700-715	5	54	26	6	113	17	2	25	48	25	62	1	384
715-730	1	90	42	12	140	30	4	36	52	42	88	4	541
730-745	9	94	70	25	192	27	17	55	55	32	116	5	697
745-800	4	122	107	51	226	42	37	61	79	52	195	12	988
800-815	3	129	83	46	230	46	19	81	73	29	124	9	872
815-830	4	112	75	36	195	49	26	61	57	29	146	9	799
830-845	6	94	88	52	182	48	29	42	70	47	179	5	842
845-900	2	78	104	68	158	54	42	68	64	35	160	17	850
HOUR TOTALS													
700-800	19	360	245	94	671	116	60	177	234	151	461	22	2610
715-815	17	435	302	134	788	145	77	233	259	155	523	30	3098
730-830	20	457	335	158	843	164	99	258	264	142	581	35	3356
745-845	17	457	353	185	833	185	111	245	279	157	644	35	3501
800-900	15	413	350	202	765	197	116	252	264	140	609	40	3363



PEDESTRIAN COUNTS				
PERIOD 15 MIN COUNTS	NORTH LEG	EAST LEG	SOUTH LEG	WEST LEG
700-715	1	0	3	2
715-730	0	0	4	3
730-745	0	5	13	13
745-800	3	8	4	1
800-815	0	1	16	6
815-830	1	5	10	6
830-845	0	6	21	10
845-900	0	4	9	0
HOUR TOTALS				
700-800	4	13	24	19
715-815	3	14	37	23
730-830	4	19	43	26
745-845	4	20	51	23
800-900	1	16	56	22

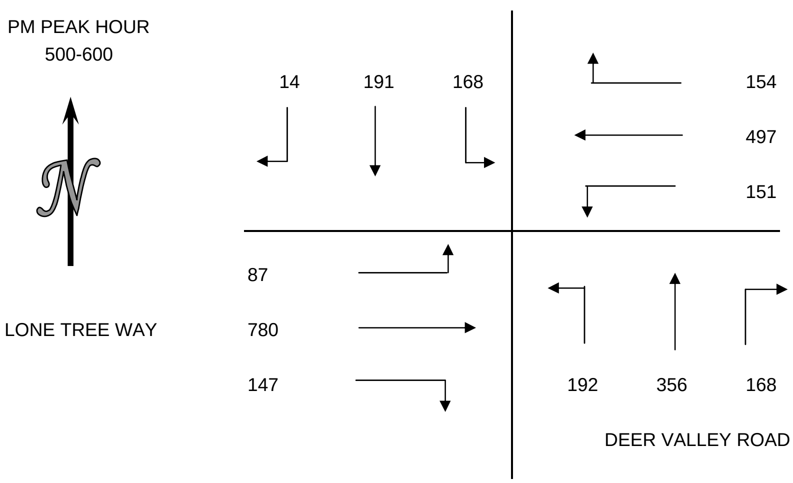
WILTEC

Phone: (626) 564-1944 Fax: (626) 564-0969

INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: KIMLEY -HORN AND ASSOCIATES, INC.
PROJECT: ANTIOCH TRAFFIC COUNTS
DATE: THURSDAY MAY 15, 2008
PERIOD: 4:00 PM TO 6:00 PM
INTERSECTION: N/S DEER VALLEY ROAD
E/W LONE TREE WAY

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	TOTALS
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	
400-415	3	52	35	44	118	33	40	93	76	50	224	18	786
415-430	3	43	31	36	122	25	34	81	34	38	203	24	674
430-445	7	39	47	50	113	35	45	97	58	33	211	10	745
445-500	5	44	42	38	108	24	26	82	45	36	203	14	667
500-515	6	46	27	36	117	43	44	105	48	31	188	16	707
515-530	2	56	38	43	122	39	42	91	46	45	200	28	752
530-545	3	48	60	37	118	35	42	97	57	28	196	28	749
545-600	3	41	43	38	140	34	40	63	41	43	196	15	697
HOUR TOTALS													
400-500	18	178	155	168	461	117	145	353	213	157	841	66	2872
415-515	21	172	147	160	460	127	149	365	185	138	805	64	2793
430-530	20	185	154	167	460	141	157	375	197	145	802	68	2871
445-545	16	194	167	154	465	141	154	375	196	140	787	86	2875
500-600	14	191	168	154	497	151	168	356	192	147	780	87	2905



PEDESTRIAN COUNTS				
PERIOD 15 MIN COUNTS	NORTH LEG	EAST LEG	SOUTH LEG	WEST LEG
400-415	0	9	2	2
415-430	8	2	2	1
430-445	0	0	2	0
445-500	0	0	0	2
500-515	0	0	8	0
515-530	2	3	3	0
530-545	0	0	1	0
545-600	0	0	1	1
HOUR TOTALS				
400-500	8	11	6	5
415-515	8	2	12	3
430-530	2	3	13	2
445-545	2	3	12	2
500-600	2	3	13	1

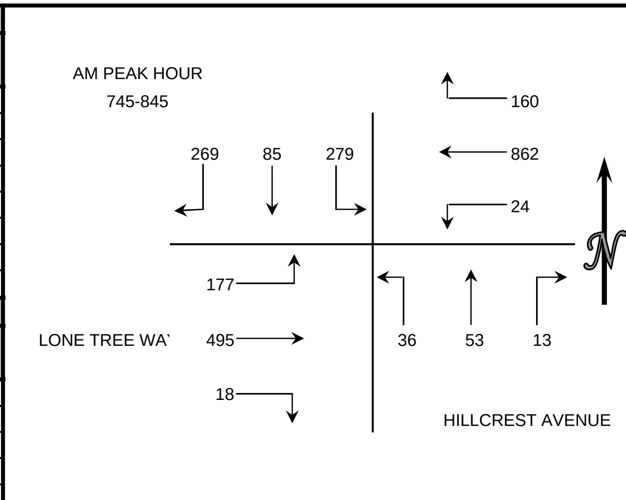
WILTEC

Phone: (626) 564-1944 Fax: (626) 564-0969

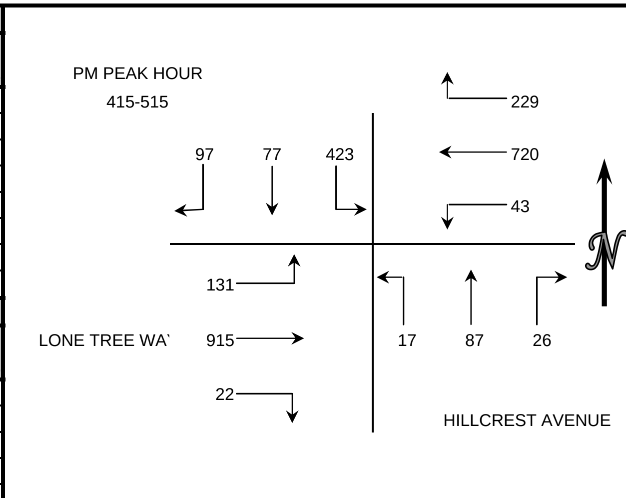
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: KIMLEY -HORN AND ASSOCIATES, INC.
PROJECT: ANTIOCH TRAFFIC COUNTS
DATE: THURSDAY MAY 15, 2008
PERIODS: 7:00 AM TO 9:00 AM AND 4:00 PM TO 6:00 PM
INTERSECTION: N/S HILLCREST AVENUE
E/W LONE TREE WAY
CITY: ANTIOCH

15 MIN COUNTS					7:00 AM TO 9:00 AM								
	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
700-715	18	8	52	38	116	1	2	20	5	2	75	7	344
715-730	34	7	38	17	151	4	4	8	2	2	66	8	341
730-745	47	12	39	23	212	3	1	18	6	4	92	11	468
745-800	80	29	70	41	240	5	5	16	10	4	136	54	690
800-815	57	20	74	41	217	10	5	17	10	3	128	61	643
815-830	46	11	72	46	218	5	2	12	7	7	114	32	572
830-845	86	25	63	32	187	4	1	8	9	4	117	30	566
845-900	90	30	78	41	172	3	9	6	14	3	138	55	639
HOUR TOTALS													
	1	2	3	4	5	6	7	8	9	10	11	12	
TIME	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
700-800	179	56	199	119	719	13	12	62	23	12	369	80	1843
715-815	218	68	221	122	820	22	15	59	28	13	422	134	2142
730-830	230	72	255	151	887	23	13	63	33	18	470	158	2373
745-845	269	85	279	160	862	24	13	53	36	18	495	177	2471
800-900	279	86	287	160	794	22	17	43	40	17	497	178	2420



15 MIN COUNTS					4:00 PM TO 6:00 PM								
	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
400-415	15	16	99	51	172	9	6	13	7	11	238	37	674
415-430	9	21	79	57	179	10	8	31	7	8	203	23	635
430-445	37	21	105	47	179	6	10	17	5	5	247	45	724
445-500	19	12	112	54	161	8	3	17	2	6	211	34	639
500-515	32	23	127	71	201	19	5	22	3	3	254	29	789
515-530	14	15	91	38	138	11	1	19	4	3	209	24	567
530-545	16	28	95	51	144	12	9	25	11	7	231	26	655
545-600	22	27	74	52	193	12	6	21	4	13	193	37	654
HOUR TOTALS													
	1	2	3	4	5	6	7	8	9	10	11	12	
TIME	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
400-500	80	70	395	209	691	33	27	78	21	30	899	139	2672
415-515	97	77	423	229	720	43	26	87	17	22	915	131	2787
430-530	102	71	435	210	679	44	19	75	14	17	921	132	2719
445-545	81	78	425	214	644	50	18	83	20	19	905	113	2650
500-600	84	93	387	212	676	54	21	87	22	26	887	116	2665



WILTEC

Phone: (626) 564-1944 Fax: (626) 564-0969

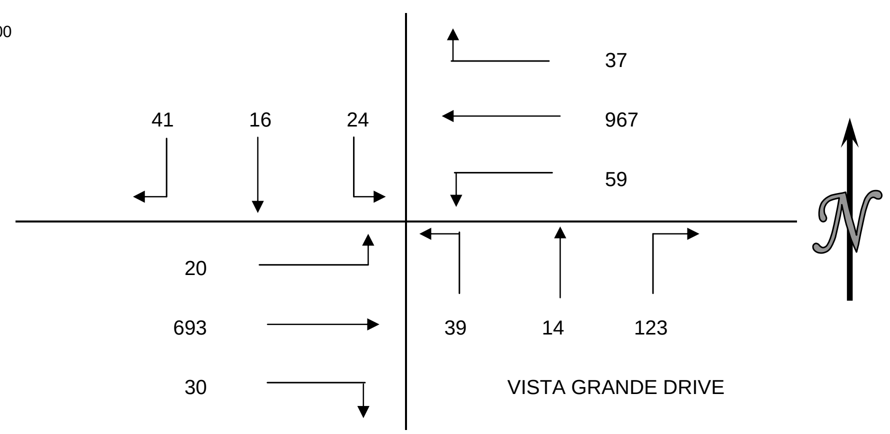
INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT:		KIMLEY -HORN AND ASSOCIATES, INC.
PROJECT:		ANTIOCH TRAFFIC COUNTS
DATE:		THURSDAY MAY 15, 2008
PERIOD"		7:00 AM TO 9:00 AM
INTERSECTION:	N/S	VISTA GRANDE DRIVE
	E/W	LONE TREE WAY
CITY:		ANTIOCH

VEHICLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
700-715	5	1	3	1	127	3	15	2	11	1	85	2	256
715-730	11	1	0	1	156	11	25	4	10	3	115	3	340
730-745	13	4	5	5	235	11	31	4	11	2	148	9	478
745-800	23	1	8	3	255	11	34	5	17	4	179	1	541
800-815	20	8	15	5	230	11	30	6	14	8	154	5	506
815-830	7	5	2	9	237	14	28	2	11	4	156	2	477
830-845	5	3	2	11	251	11	30	3	11	10	183	6	526
845-900	9	0	5	12	249	23	35	3	3	8	200	7	554
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
700-800	52	7	16	10	773	36	105	15	49	10	527	15	1615
715-815	67	14	28	14	876	44	120	19	52	17	596	18	1865
730-830	63	18	30	22	957	47	123	17	53	18	637	17	2002
745-845	55	17	27	28	973	47	122	16	53	26	672	14	2050
800-900	41	16	24	37	967	59	123	14	39	30	693	20	2063

AM PEAK HOUR: 800-900



LONE TREE WAY

PEDESTRIAN COUNTS

15 MIN COUNTS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
700-715	0	0	0	1	1
715-730	2	0	0	0	2
730-745	1	1	2	1	5
745-800	0	0	0	1	1
800-815	0	0	0	0	0
815-830	0	0	0	0	0
830-845	0	0	0	0	0
845-900	0	0	0	0	0
HOUR TOTALS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
700-800	3	1	2	3	9
715-815	3	1	2	2	8
730-830	1	1	2	2	6
745-845	0	0	0	1	1
800-900	0	0	0	0	0

BICYCLE COUNTS

15 MIN COUNTS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
700-715	0	0	1	0	1
715-730	0	0	0	0	0
730-745	0	0	0	0	0
745-800	1	0	0	0	1
800-815	1	0	1	1	3
815-830	0	0	1	0	1
830-845	1	0	1	1	3
845-900	1	0	0	0	1
HOUR TOTALS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
700-800	1	0	1	0	2
715-815	2	0	1	1	4
730-830	2	0	2	1	5
745-845	3	0	3	2	8
800-900	3	0	3	2	8

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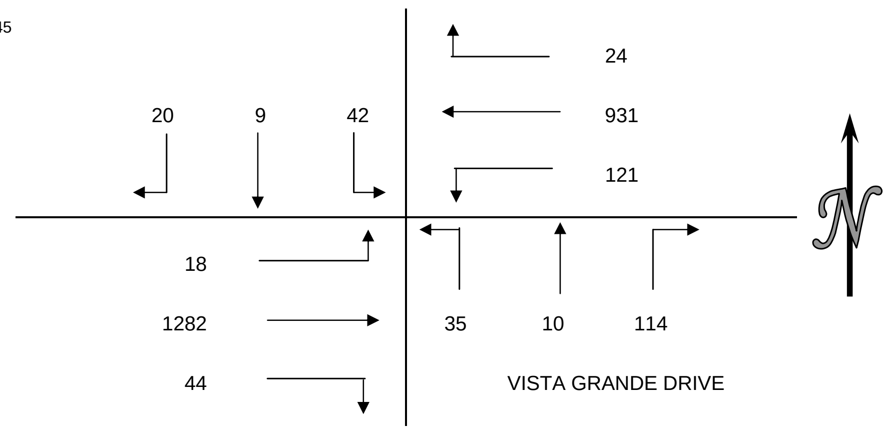
INTERSECTION CAR/PED/BIKE TRAFFIC COUNT RESULTS SUMMARY

CLIENT:		KIMLEY -HORN AND ASSOCIATES, INC.
PROJECT:		ANTIOCH TRAFFIC COUNTS
DATE:		THURSDAY MAY 15, 2008
PERIOD"		4:00 PM TO 6:00 PM
INTERSECTION:	N/S	VISTA GRANDE DRIVE
	E/W	LONE TREE WAY
CITY:		ANTIOCH

VEHICLE COUNTS

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
400-415	6	2	4	7	218	33	29	4	8	19	309	10	649
415-430	4	1	8	8	183	29	34	4	10	11	296	5	593
430-445	3	1	7	7	198	21	29	3	10	10	329	9	627
445-500	6	0	11	8	229	28	27	2	12	10	312	5	650
500-515	6	3	15	6	250	29	31	2	10	15	315	3	685
515-530	2	2	8	7	247	31	24	2	7	9	327	5	671
530-545	6	4	8	3	205	33	32	4	6	10	328	5	644
545-600	8	2	6	5	232	29	33	6	11	6	267	9	614
HOUR TOTALS	1	2	3	4	5	6	7	8	9	10	11	12	
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	TOTAL
400-500	19	4	30	30	828	111	119	13	40	50	1246	29	2519
415-515	19	5	41	29	860	107	121	11	42	46	1252	22	2555
430-530	17	6	41	28	924	109	111	9	39	44	1283	22	2633
445-545	20	9	42	24	931	121	114	10	35	44	1282	18	2650
500-600	22	11	37	21	934	122	120	14	34	40	1237	22	2614

AM PEAK HOUR: 445-545



LONE TREE WAY

PEDESTRIAN COUNTS

15 MIN COUNTS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
400-415	0	2	0	0	2
415-430	0	1	0	0	1
430-445	0	1	2	1	4
445-500	0	1	2	0	3
500-515	2	0	0	0	2
515-530	0	0	0	0	0
530-545	1	2	0	0	3
545-600	1	0	0	0	1
HOUR TOTALS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
400-500	0	5	4	1	10
415-515	2	3	4	1	10
430-530	2	2	4	1	9
445-545	3	3	2	0	8
500-600	4	2	0	0	6

BICYCLE COUNTS

15 MIN COUNTS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
400-415	0	0	0	0	0
415-430	0	0	0	0	0
430-445	1	1	0	0	2
445-500	0	0	3	0	3
500-515	0	0	0	0	0
515-530	1	0	0	2	3
530-545	0	0	0	0	0
545-600	0	0	0	0	0
HOUR TOTALS	NORTH	EAST	SOUTH	WEST	TOTAL
PERIOD	LEG	LEG	LEG	LEG	
400-500	1	1	3	0	5
415-515	1	1	3	0	5
430-530	2	1	3	2	8
445-545	1	0	3	2	6
500-600	1	0	0	2	3

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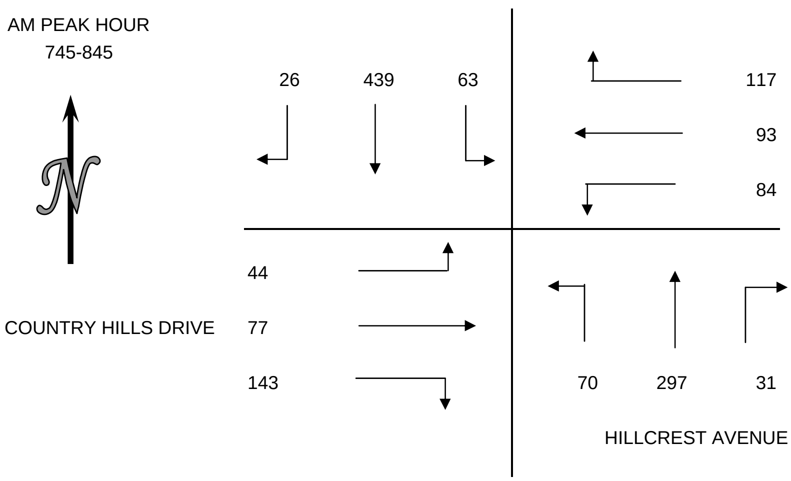
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: KIMLEY -HORN AND ASSOCIATES, INC.
PROJECT: ANTIOCH TRAFFIC COUNTS
DATE: THURSDAY MAY 15, 2008
PERIOD: 7:00 AM TO 9:00 AM
INTERSECTION: N/S HILLCREST AVENUE
E/W COUNTRY HILLS DRIVE

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	TOTALS
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	
700-715	4	46	6	21	2	3	0	41	1	13	6	5	148
715-730	7	60	8	28	9	10	4	50	11	19	7	16	229
730-745	3	70	19	36	18	14	5	69	7	26	7	14	288
745-800	4	105	25	37	32	33	9	62	18	39	33	15	412
800-815	5	118	22	47	41	21	10	95	22	28	28	12	449
815-830	10	113	7	20	14	16	4	69	18	40	12	11	334
830-845	7	103	9	13	6	14	8	71	12	36	4	6	289
845-900	5	125	4	11	2	13	5	62	18	31	7	10	293
HOUR TOTALS													
700-800	18	281	58	122	61	60	18	222	37	97	53	50	1077
715-815	19	353	74	148	100	78	28	276	58	112	75	57	1378
730-830	22	406	73	140	105	84	28	295	65	133	80	52	1483
745-845	26	439	63	117	93	84	31	297	70	143	77	44	1484
800-900	27	459	42	91	63	64	27	297	70	135	51	39	1365



PEDESTRIAN COUNTS				
PERIOD 15 MIN COUNTS	NORTH LEG	EAST LEG	SOUTH LEG	WEST LEG
700-715	0	1	0	0
715-730	3	0	9	0
730-745	2	0	6	2
745-800	8	0	6	1
800-815	3	0	2	6
815-830	2	2	4	2
830-845	1	0	0	0
845-900	0	0	2	0
HOUR TOTALS				
700-800	13	1	21	3
715-815	16	0	23	9
730-830	15	2	18	11
745-845	14	2	12	9
800-900	6	2	8	8

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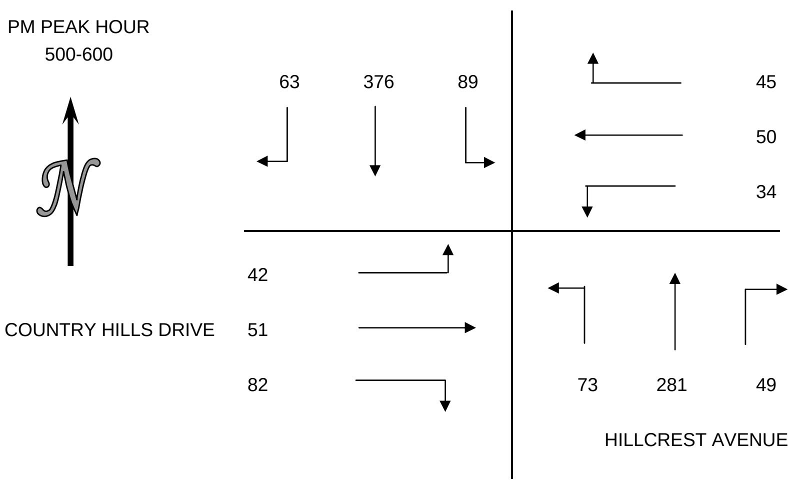
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: KIMLEY -HORN AND ASSOCIATES, INC.
PROJECT: ANTIOCH TRAFFIC COUNTS
DATE: THURSDAY MAY 15, 2008
PERIOD: 4:00 PM TO 6:00 PM
INTERSECTION: N/S HILLCREST AVENUE
E/W COUNTRY HILLS DRIVE

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	TOTALS
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	
400-415	11	97	17	10	20	2	7	76	23	20	12	11	306
415-430	10	71	12	13	16	5	7	75	19	16	12	3	259
430-445	10	91	12	14	13	3	10	70	21	16	8	6	274
445-500	10	89	24	7	13	10	14	76	20	17	8	10	298
500-515	14	92	20	11	13	6	8	66	20	16	10	18	294
515-530	19	99	19	12	12	39	13	75	15	14	8	10	335
530-545	18	83	21	13	13	-19	17	71	15	22	20	8	282
545-600	12	102	29	9	12	8	11	69	23	30	13	6	324
HOUR TOTALS													
400-500	41	348	65	44	62	20	38	297	83	69	40	30	1137
415-515	44	343	68	45	55	24	39	287	80	65	38	37	1125
430-530	53	371	75	44	51	58	45	287	76	63	34	44	1201
445-545	61	363	84	43	51	36	52	288	70	69	46	46	1209
500-600	63	376	89	45	50	34	49	281	73	82	51	42	1235



PEDESTRIAN COUNTS				
PERIOD 15 MIN COUNTS	NORTH LEG	EAST LEG	SOUTH LEG	WEST LEG
400-415	0	0	5	0
415-430	0	0	0	0
430-445	4	0	1	0
445-500	0	1	0	0
500-515	0	0	1	0
515-530	0	0	2	0
530-545	1	0	2	0
545-600	1	0	0	0
HOUR TOTALS				
400-500	4	1	6	0
415-515	4	1	2	0
430-530	4	1	4	0
445-545	1	1	5	0
500-600	2	0	5	0

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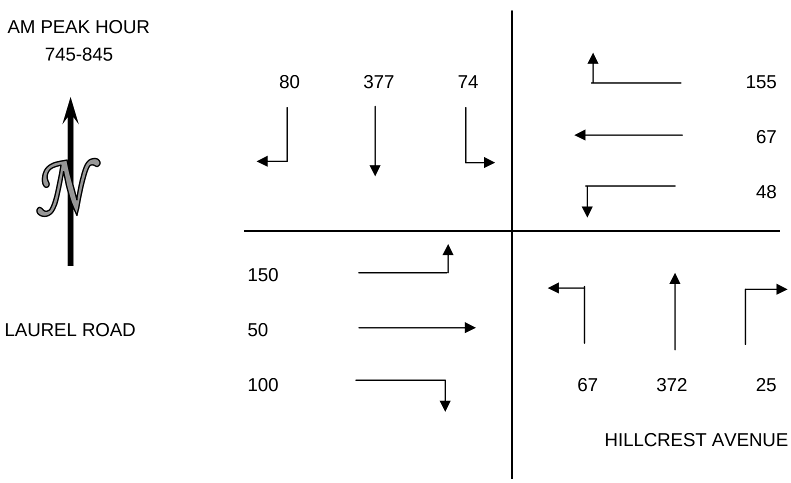
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT:		KIMLEY -HORN AND ASSOCIATES, INC.
PROJECT:		ANTIOCH TRAFFIC COUNTS
DATE:		THURSDAY MAY 15, 2008
PERIOD:		7:00 AM TO 9:00 AM
INTERSECTION:	N/S	HILLCREST AVENUE
	E/W	LAUREL ROAD

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	TOTALS
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	
700-715	3	50	8	38	1	4	1	58	2	3	4	13	185
715-730	4	47	13	37	1	5	2	74	5	5	1	6	200
730-745	8	91	10	47	3	6	3	96	8	14	3	13	302
745-800	15	110	19	50	3	12	4	92	16	24	6	25	376
800-815	28	92	12	40	26	12	11	112	29	22	17	36	437
815-830	32	92	29	34	31	6	6	92	13	25	19	60	439
830-845	5	83	14	31	7	18	4	76	9	29	8	29	313
845-900	3	110	15	19	2	13	14	24	5	6	3	9	223
HOUR TOTALS													
700-800	30	298	50	172	8	27	10	320	31	46	14	57	1063
715-815	55	340	54	174	33	35	20	374	58	65	27	80	1315
730-830	83	385	70	171	63	36	24	392	66	85	45	134	1554
745-845	80	377	74	155	67	48	25	372	67	100	50	150	1565
800-900	68	377	70	124	66	49	35	304	56	82	47	134	1412



PEDESTRIAN COUNTS				
PERIOD 15 MIN COUNTS	NORTH LEG	EAST LEG	SOUTH LEG	WEST LEG
700-715	0	0	1	1
715-730	0	0	3	1
730-745	4	0	1	0
745-800	2	5	10	1
800-815	1	1	6	0
815-830	1	5	3	1
830-845	0	1	0	0
845-900	0	5	0	0
HOUR TOTALS				
700-800	6	5	15	3
715-815	7	6	20	2
730-830	8	11	20	2
745-845	4	12	19	2
800-900	2	12	9	1

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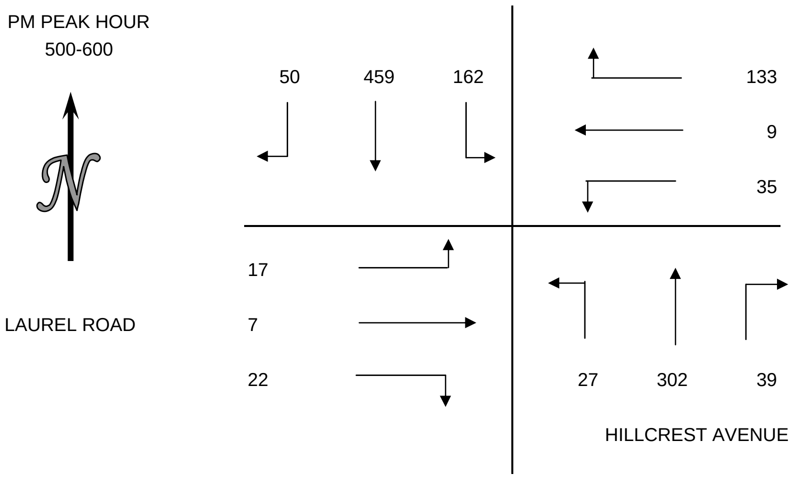
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: KIMLEY -HORN AND ASSOCIATES, INC.
PROJECT: ANTIOCH TRAFFIC COUNTS
DATE: THURSDAY MAY 15, 2008
PERIOD: 4:00 PM TO 6:00 PM
INTERSECTION: N/S HILLCREST AVENUE
E/W LAUREL ROAD

15 MIN COUNTS	1	2	3	4	5	6	7	8	9	10	11	12	TOTALS
PERIOD	SBRT	SBTH	SBLT	WBRT	WBTH	WBLT	NBRT	NBTH	NBLT	EBRT	EBTH	EBLT	
400-415	7	104	27	42	0	5	8	87	7	8	4	6	305
415-430	7	90	35	35	4	4	6	90	3	2	0	5	281
430-445	11	105	28	34	2	7	7	75	5	7	2	6	289
445-500	8	119	30	37	1	3	9	77	7	0	3	2	296
500-515	11	106	42	45	1	10	10	81	5	5	2	4	322
515-530	12	123	37	29	3	15	6	80	8	4	2	3	322
530-545	14	114	43	27	3	3	8	72	11	5	2	4	306
545-600	13	116	40	32	2	7	15	69	3	8	1	6	312
HOUR TOTALS													
400-500	33	418	120	148	7	19	30	329	22	17	9	19	1171
415-515	37	420	135	151	8	24	32	323	20	14	7	17	1188
430-530	42	453	137	145	7	35	32	313	25	16	9	15	1229
445-545	45	462	152	138	8	31	33	310	31	14	9	13	1246
500-600	50	459	162	133	9	35	39	302	27	22	7	17	1262

PM PEAK HOUR
500-600



PEDESTRIAN COUNTS				
PERIOD 15 MIN COUNTS	NORTH LEG	EAST LEG	SOUTH LEG	WEST LEG
400-415	0	0	1	0
415-430	0	1	0	0
430-445	0	0	0	0
445-500	0	0	0	0
500-515	0	0	0	0
515-530	0	0	0	0
530-545	0	0	0	0
545-600	1	1	2	0
HOUR TOTALS				
400-500	0	1	1	0
415-515	0	1	0	0
430-530	0	0	0	0
445-545	0	0	0	0
500-600	1	1	2	0

APPENDIX B:

HCM LOS Calculation worksheets

Fehr & Peers
Transportation Consultants

Existing

FEHR & PEERS
TRANSPORTATION CONSULTANTS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	0.97	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.91	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	5085	1583	3433	1613	1504	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	5085	1583	3433	1613	1504	1770	1863	1583
Volume (vph)	29	746	52	166	1005	168	36	14	51	190	31	34
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	32	829	58	184	1117	187	40	16	57	211	34	38
RTOR Reduction (vph)	0	0	17	0	0	65	0	22	32	0	0	31
Lane Group Flow (vph)	32	829	41	184	1117	122	40	17	2	211	34	7
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	3.6	74.5	74.5	11.2	82.1	82.1	5.0	7.3	7.3	19.0	21.3	21.3
Effective Green, g (s)	4.6	77.5	77.5	12.2	85.1	85.1	6.0	8.3	8.3	20.0	22.3	22.3
Actuated g/C Ratio	0.04	0.60	0.60	0.09	0.65	0.65	0.05	0.06	0.06	0.15	0.17	0.17
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	6.0	6.0	2.0	2.0	2.0	2.0	6.0	6.0
Lane Grp Cap (vph)	63	3031	944	322	3329	1036	158	103	96	272	320	272
v/s Ratio Prot	c0.02	0.16		c0.05	c0.22		0.01	c0.01		c0.12	0.02	
v/s Ratio Perm			0.03			0.08			0.00			0.00
v/c Ratio	0.51	0.27	0.04	0.57	0.34	0.12	0.25	0.17	0.02	0.78	0.11	0.02
Uniform Delay, d1	61.6	12.7	10.9	56.4	9.9	8.4	59.8	57.6	57.0	52.8	45.4	44.8
Progression Factor	0.81	0.61	0.39	1.23	0.59	0.41	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.0	0.2	0.1	1.4	0.3	0.2	0.3	0.3	0.0	11.9	0.4	0.1
Delay (s)	51.9	7.9	4.3	70.5	6.1	3.6	60.1	57.9	57.1	64.7	45.9	44.9
Level of Service	D	A	A	E	A	A	E	E	E	E	D	D
Approach Delay (s)		9.2			13.8			58.4			59.8	
Approach LOS		A			B			E			E	

Intersection Summary			
HCM Average Control Delay	18.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Util. Factor		0.91	1.00	0.97	0.91					0.95	0.95	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5085	1583	3433	5085					1681	1689	1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5085	1583	3433	5085					1681	1689	1583
Volume (vph)	0	571	401	72	1000	0	0	0	0	287	6	353
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	634	446	80	1111	0	0	0	0	319	7	392
RTOR Reduction (vph)	0	0	171	0	0	0	0	0	0	0	0	50
Lane Group Flow (vph)	0	634	275	80	1111	0	0	0	0	160	166	342
Confl. Peds. (#/hr)							2					
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		2		1	6						4	
Permitted Phases			2							4		4
Actuated Green, G (s)		77.6	77.6	7.1	88.7					31.8	31.8	31.8
Effective Green, g (s)		80.1	80.1	8.1	91.2					32.8	32.8	32.8
Actuated g/C Ratio		0.62	0.62	0.06	0.70					0.25	0.25	0.25
Clearance Time (s)		5.5	5.5	4.0	5.5					4.0	4.0	4.0
Vehicle Extension (s)		4.0	4.0	3.0	4.0					3.0	3.0	3.0
Lane Grp Cap (vph)		3133	975	214	3567					424	426	399
v/s Ratio Prot		0.12		c0.02	c0.22							
v/s Ratio Perm			0.17							0.10	0.10	c0.22
v/c Ratio		0.20	0.28	0.37	0.31					0.38	0.39	0.86
Uniform Delay, d1		10.9	11.6	58.5	7.4					40.2	40.3	46.4
Progression Factor		0.82	1.16	1.32	0.38					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.7	1.1	0.2					0.6	0.6	16.4
Delay (s)		9.1	14.2	78.4	3.0					40.7	40.9	62.7
Level of Service		A	B	E	A					D	D	E
Approach Delay (s)		11.2			8.1			0.0			52.8	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM Average Control Delay	20.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			
Lane Util. Factor		0.91	1.00	1.00	0.91	1.00	0.95	0.95	1.00			
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00			
Satd. Flow (prot)		5085	1583	1770	5085	1583	1681	1697	1583			
Flt Permitted		1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00			
Satd. Flow (perm)		5085	1583	1770	5085	1583	1681	1697	1583			
Volume (vph)	0	662	160	8	671	245	383	29	79	0	0	0
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	0	744	180	9	754	275	430	33	89	0	0	0
RTOR Reduction (vph)	0	0	47	0	0	61	0	0	74	0	0	0
Lane Group Flow (vph)	0	744	133	9	754	215	226	237	15	0	0	0
Turn Type			Perm	Prot		Perm	Split		Perm			
Protected Phases		2		1	6		8	8				
Permitted Phases			2			6			8			
Actuated Green, G (s)		93.2	93.2	1.2	98.4	98.4	21.6	21.6	21.6			
Effective Green, g (s)		96.2	96.2	2.2	101.4	101.4	22.6	22.6	22.6			
Actuated g/C Ratio		0.74	0.74	0.02	0.78	0.78	0.17	0.17	0.17			
Clearance Time (s)		6.0	6.0	4.0	6.0	6.0	4.0	4.0	4.0			
Vehicle Extension (s)		4.0	4.0	2.0	4.0	4.0	2.0	2.0	2.0			
Lane Grp Cap (vph)		3763	1171	30	3966	1235	292	295	275			
v/s Ratio Prot		c0.15		c0.01	0.15		0.13	c0.14				
v/s Ratio Perm			0.08			0.14			0.01			
v/c Ratio		0.20	0.11	0.30	0.19	0.17	0.77	0.80	0.06			
Uniform Delay, d1		5.1	4.8	63.1	3.7	3.6	51.3	51.6	44.8			
Progression Factor		0.53	1.33	0.63	2.36	11.24	1.00	1.00	1.00			
Incremental Delay, d2		0.1	0.2	2.0	0.1	0.3	11.0	13.8	0.0			
Delay (s)		2.9	6.6	42.0	8.8	41.2	62.3	65.4	44.8			
Level of Service		A	A	D	A	D	E	E	D			
Approach Delay (s)		3.6			17.7			60.8			0.0	
Approach LOS		A			B			E			A	

Intersection Summary			
HCM Average Control Delay	22.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	33.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1549	1770	3539	1562	3433	3080		3433	1863	1563
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1549	1770	3539	1562	3433	3080		3433	1863	1563
Volume (vph)	74	484	91	54	837	29	39	47	191	42	35	24
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	82	538	101	60	930	32	43	52	212	47	39	27
RTOR Reduction (vph)	0	0	34	0	0	11	0	185	0	0	0	24
Lane Group Flow (vph)	82	538	67	60	930	21	43	79	0	47	39	3
Confl. Peds. (#/hr)	1		1	1		1	1		1	1		1
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	8.5	83.5	83.5	7.7	82.7	82.7	5.9	15.4		5.4	14.9	14.9
Effective Green, g (s)	9.5	86.5	86.5	8.7	85.7	85.7	6.9	16.4		6.4	15.9	15.9
Actuated g/C Ratio	0.07	0.67	0.67	0.07	0.66	0.66	0.05	0.13		0.05	0.12	0.12
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0	3.0	3.0	4.0		2.0	2.0	2.0
Lane Grp Cap (vph)	251	3383	1031	118	2333	1030	182	389		169	228	191
v/s Ratio Prot	0.02	0.11		c0.03	c0.26		c0.01	c0.03		c0.01	0.02	
v/s Ratio Perm			0.04			0.01						0.00
v/c Ratio	0.33	0.16	0.07	0.51	0.40	0.02	0.24	0.20		0.28	0.17	0.02
Uniform Delay, d1	57.2	8.1	7.6	58.6	10.2	7.7	59.0	50.9		59.6	51.1	50.2
Progression Factor	0.88	0.88	1.72	0.93	1.61	3.11	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.8	0.1	0.1	1.2	0.5	0.0	0.7	0.4		0.3	0.1	0.0
Delay (s)	51.1	7.2	13.2	55.9	17.0	23.8	59.7	51.3		59.9	51.3	50.2
Level of Service	D	A	B	E	B	C	E	D		E	D	D
Approach Delay (s)		13.1			19.5			52.5			54.6	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	23.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1562	1770	3539	1583	3433	1863	1562	3433	3167	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1562	1770	3539	1583	3433	1863	1562	3433	3167	
Volume (vph)	168	499	26	81	638	80	89	48	41	105	77	181
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	187	554	29	90	709	89	99	53	46	117	86	201
RTOR Reduction (vph)	0	0	11	0	0	39	0	0	41	0	180	0
Lane Group Flow (vph)	187	554	18	90	709	50	99	53	5	117	107	0
Confl. Peds. (#/hr)			1	1					1	1		
Turn Type	Prot		Perm	Prot		Perm	Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	17.6	78.3	78.3	10.8	71.5	71.5	12.2	12.2	12.2	12.7	12.7	
Effective Green, g (s)	18.6	79.3	79.3	11.8	72.5	72.5	13.2	13.2	13.2	13.7	13.7	
Actuated g/C Ratio	0.14	0.61	0.61	0.09	0.56	0.56	0.10	0.10	0.10	0.11	0.11	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	253	3102	953	161	1974	883	349	189	159	362	334	
v/s Ratio Prot	c0.11	0.11		0.05	c0.20		c0.03	0.03		c0.03	0.03	
v/s Ratio Perm			0.01			0.03			0.00			
v/c Ratio	0.74	0.18	0.02	0.56	0.36	0.06	0.28	0.28	0.03	0.32	0.32	
Uniform Delay, d1	53.4	11.1	10.0	56.6	15.9	13.1	54.0	54.0	52.6	53.9	53.8	
Progression Factor	1.11	0.64	0.37	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	9.3	0.1	0.0	2.4	0.5	0.1	0.2	0.3	0.0	0.2	0.2	
Delay (s)	68.7	7.2	3.7	59.0	16.4	13.2	54.2	54.3	52.7	54.0	54.0	
Level of Service	E	A	A	E	B	B	D	D	D	D	D	
Approach Delay (s)		22.0			20.4			53.9			54.0	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	29.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.83	1.00	1.00	0.92	1.00	0.96		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1311	1770	3539	1454	3433	3245		2000	3508	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1311	1770	3539	1454	3433	3245		1770	3508	
Volume (vph)	35	644	157	185	833	185	279	245	111	353	457	17
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	39	724	176	208	936	208	313	275	125	397	513	19
RTOR Reduction (vph)	0	0	47	0	0	39	0	42	0	0	2	0
Lane Group Flow (vph)	39	724	129	208	936	169	313	358	0	397	530	0
Confl. Peds. (#/hr)	44		101	101		44	58		69	69		58
Confl. Bikes (#/hr)			31			15			13			5
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	7.3	38.5	38.5	18.4	49.6	49.6	16.7	24.3		30.3	37.9	
Effective Green, g (s)	8.8	40.5	40.5	19.9	51.6	51.6	18.2	25.8		31.8	39.4	
Actuated g/C Ratio	0.07	0.31	0.31	0.15	0.40	0.40	0.14	0.20		0.24	0.30	
Clearance Time (s)	4.5	5.0	5.0	4.5	5.0	5.0	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	7.0	7.0	3.0	7.0	7.0	3.0	3.0		4.0	3.0	
Lane Grp Cap (vph)	120	1103	408	271	1405	577	481	644		489	1063	
v/s Ratio Prot	0.02	0.20		c0.12	c0.26		0.09	c0.11		c0.20	0.15	
v/s Ratio Perm			0.10			0.12						
v/c Ratio	0.32	0.66	0.32	0.77	0.67	0.29	0.65	0.56		0.81	0.50	
Uniform Delay, d1	57.8	38.7	34.2	52.8	32.1	26.7	52.9	46.9		46.3	37.2	
Progression Factor	1.18	1.30	1.64	1.16	0.53	0.30	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	2.8	1.9	7.6	1.5	0.8	3.1	1.0		10.4	0.4	
Delay (s)	69.7	53.0	57.9	69.0	18.6	8.9	56.0	48.0		56.7	37.6	
Level of Service	E	D	E	E	B	A	E	D		E	D	
Approach Delay (s)		54.6			24.9			51.5			45.7	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM Average Control Delay	41.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	87.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		0.91	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.96	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00
Satd. Flow (prot)	1770	3539	1515	1770	3539	1520	1770	3421		1900	3288	1554
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00
Satd. Flow (perm)	1770	3539	1515	1770	3539	1520	1770	3421		1610	3288	1554
Volume (vph)	177	495	18	24	862	160	36	53	13	279	85	269
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	197	550	20	27	958	178	40	59	14	310	94	299
RTOR Reduction (vph)	0	0	9	0	0	86	0	12	0	0	0	247
Lane Group Flow (vph)	197	550	11	27	958	92	40	61	0	155	249	52
Confl. Peds. (#/hr)	18		20	20		18	5		10	10		5
Confl. Bikes (#/hr)			12			9						
Turn Type	Prot		Perm	Prot		Perm	Split			Split		Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	18.1	71.0	71.0	3.4	55.8	55.8	15.4	15.4		20.7	20.7	20.7
Effective Green, g (s)	20.1	73.0	73.0	4.9	57.8	57.8	17.4	17.4		22.7	22.7	22.7
Actuated g/C Ratio	0.15	0.56	0.56	0.04	0.44	0.44	0.13	0.13		0.17	0.17	0.17
Clearance Time (s)	5.0	5.0	5.0	4.5	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	5.0	5.0	5.0	3.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lane Grp Cap (vph)	274	1987	851	67	1573	676	237	458		332	574	271
v/s Ratio Prot	c0.11	0.16		0.02	c0.27		c0.02	0.02		c0.08	0.08	
v/s Ratio Perm			0.01			0.06						0.03
v/c Ratio	0.72	0.28	0.01	0.40	0.61	0.14	0.17	0.13		0.47	0.43	0.19
Uniform Delay, d1	52.3	14.8	12.6	61.1	27.5	21.3	49.9	49.6		48.2	47.9	45.8
Progression Factor	1.31	1.10	1.95	1.18	0.73	0.62	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	9.8	0.3	0.0	3.5	1.6	0.4	0.7	0.3		2.2	1.1	0.7
Delay (s)	78.0	16.6	24.5	75.8	21.8	13.6	50.6	49.9		50.4	49.0	46.6
Level of Service	E	B	C	E	C	B	D	D		D	D	D
Approach Delay (s)		32.6			21.8			50.2			48.3	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	32.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.87		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5049		1770	5057		1770	1612		1770	1661	
Flt Permitted	0.95	1.00		0.95	1.00		0.66	1.00		0.31	1.00	
Satd. Flow (perm)	1770	5049		1770	5057		1233	1612		585	1661	
Volume (vph)	20	693	30	59	967	37	39	14	123	24	16	41
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	22	745	32	63	1040	40	42	15	132	26	17	44
RTOR Reduction (vph)	0	2	0	0	2	0	0	118	0	0	39	0
Lane Group Flow (vph)	22	775	0	63	1078	0	42	29	0	26	22	0
Confl. Peds. (#/hr)			1	1								
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	5.5	93.6		9.5	97.6		12.4	12.4		12.4	12.4	
Effective Green, g (s)	7.0	96.1		11.0	100.1		13.9	13.9		13.9	13.9	
Actuated g/C Ratio	0.05	0.74		0.08	0.77		0.11	0.11		0.11	0.11	
Clearance Time (s)	4.5	5.5		4.5	5.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	4.0	6.0		4.0	6.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	95	3732		150	3894		132	172		63	178	
v/s Ratio Prot	0.01	0.15		c0.04	c0.21			0.02			0.01	
v/s Ratio Perm							0.03			c0.04		
v/c Ratio	0.23	0.21		0.42	0.28		0.32	0.17		0.41	0.12	
Uniform Delay, d1	58.9	5.2		56.5	4.4		53.7	52.8		54.2	52.5	
Progression Factor	1.02	1.10		1.10	0.62		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	0.1		2.2	0.1		1.4	0.5		4.3	0.3	
Delay (s)	61.9	5.8		64.3	2.8		55.1	53.3		58.6	52.8	
Level of Service	E	A		E	A		E	D		E	D	
Approach Delay (s)		7.4			6.2			53.7			54.6	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	12.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.92		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1665		1770	1691		1770	3468		1770	3478	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1665		1770	1691		1770	3468		1770	3478	
Volume (vph)	44	77	143	84	93	117	70	297	31	63	439	26
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	49	86	159	93	103	130	78	330	34	70	488	29
RTOR Reduction (vph)	0	39	0	0	26	0	0	3	0	0	2	0
Lane Group Flow (vph)	49	206	0	93	207	0	78	361	0	70	515	0
Confl. Peds. (#/hr)	3		2	2		3	45		16	16		45
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	21.0	21.0		20.6	20.6		9.5	66.4		9.5	66.4	
Effective Green, g (s)	21.5	21.5		21.1	21.1		10.0	67.9		10.0	67.9	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.08	0.51		0.08	0.51	
Clearance Time (s)	3.5	3.5		3.5	3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	287	270		282	269		134	1777		134	1782	
v/s Ratio Prot	0.03	c0.12		0.05	c0.12		c0.04	0.10		c0.04	c0.15	
v/s Ratio Perm												
v/c Ratio	0.17	0.76		0.33	0.77		0.58	0.20		0.52	0.29	
Uniform Delay, d1	47.8	53.1		49.4	53.4		59.2	17.6		59.0	18.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	12.0		0.7	12.4		6.3	0.3		3.6	0.4	
Delay (s)	48.1	65.0		50.1	65.8		65.5	17.8		62.6	18.9	
Level of Service	D	E		D	E		E	B		E	B	
Approach Delay (s)		62.2			61.3			26.3			24.1	
Approach LOS		E			E			C			C	

Intersection Summary			
HCM Average Control Delay	38.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	132.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1661		1767	1863	1583	1770	3539	1545	1770	3446	
Flt Permitted	0.69	1.00		0.46	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1280	1661		855	1863	1583	1770	3539	1545	1770	3446	
Volume (vph)	150	50	100	48	67	155	67	372	25	74	377	80
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	169	56	112	54	75	174	75	418	28	83	424	90
RTOR Reduction (vph)	0	91	0	0	0	142	0	0	0	0	10	0
Lane Group Flow (vph)	169	77	0	54	75	32	75	418	28	83	504	0
Confl. Peds. (#/hr)			2	2					9	9		
Turn Type	Perm			Perm		Perm	Prot		Free	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8			Free			
Actuated Green, G (s)	16.9	16.9		16.9	16.9	16.9	8.3	59.8	100.0	8.8	60.3	
Effective Green, g (s)	18.4	18.4		18.4	18.4	18.4	9.3	62.8	100.0	9.8	63.3	
Actuated g/C Ratio	0.18	0.18		0.18	0.18	0.18	0.09	0.63	1.00	0.10	0.63	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.5	3.5	3.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	236	306		157	343	291	165	2222	1545	173	2181	
v/s Ratio Prot		0.05			0.04		0.04	0.12		c0.05	c0.15	
v/s Ratio Perm	c0.13			0.06		0.02			c0.02			
v/c Ratio	0.72	0.25		0.34	0.22	0.11	0.45	0.19	0.02	0.48	0.23	
Uniform Delay, d1	38.3	34.9		35.5	34.7	34.0	42.9	7.8	0.0	42.7	7.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.14	0.44	
Incremental Delay, d2	9.9	0.4		1.6	0.4	0.2	2.0	0.2	0.0	2.0	0.2	
Delay (s)	48.2	35.3		37.1	35.1	34.2	44.9	8.0	0.0	50.6	3.7	
Level of Service	D	D		D	D	C	D	A	A	D	A	
Approach Delay (s)		41.8			34.9			12.9			10.2	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM Average Control Delay	21.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	0.97	0.95	0.95	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1562	3433	5085	1547	3433	1628	1504	1770	1863	1558
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1562	3433	5085	1547	3433	1628	1504	1770	1863	1558
Volume (vph)	54	1354	55	329	942	253	84	55	173	175	56	22
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	56	1410	57	343	981	264	88	57	180	182	58	23
RTOR Reduction (vph)	0	0	13	0	0	104	0	40	101	0	0	20
Lane Group Flow (vph)	56	1410	44	343	981	160	88	82	14	182	58	3
Confl. Peds. (#/hr)	1		1	1		1	4					4
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	8.0	66.2	66.2	17.5	75.7	75.7	11.0	14.4	14.4	13.9	17.3	17.3
Effective Green, g (s)	9.0	69.2	69.2	18.5	78.7	78.7	12.0	15.4	15.4	14.9	18.3	18.3
Actuated g/C Ratio	0.07	0.53	0.53	0.14	0.61	0.61	0.09	0.12	0.12	0.11	0.14	0.14
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	6.0	6.0	2.0	2.0	2.0	2.0	6.0	6.0
Lane Grp Cap (vph)	123	2707	831	489	3078	937	317	193	178	203	262	219
v/s Ratio Prot	0.03	c0.28		c0.10	0.19		0.03	c0.05		c0.10	c0.03	
v/s Ratio Perm			0.03			0.10			0.01			0.00
v/c Ratio	0.46	0.52	0.05	0.70	0.32	0.17	0.28	0.43	0.08	0.90	0.22	0.01
Uniform Delay, d1	58.1	19.7	14.6	53.1	12.5	11.3	55.0	53.2	51.0	56.8	49.5	48.1
Progression Factor	0.89	0.81	1.00	1.23	0.58	0.51	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.5	0.1	3.5	0.3	0.4	0.2	0.6	0.1	35.1	1.2	0.1
Delay (s)	52.6	16.5	14.8	68.7	7.6	6.1	55.1	53.8	51.0	91.9	50.7	48.2
Level of Service	D	B	B	E	A	A	E	D	D	F	D	D
Approach Delay (s)		17.7			20.5			53.2			79.0	
Approach LOS		B			C			D			E	

Intersection Summary			
HCM Average Control Delay	26.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Util. Factor		0.91	1.00	0.97	0.91					0.95	0.95	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5085	1583	3433	5085					1681	1689	1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5085	1583	3433	5085					1681	1689	1583
Volume (vph)	0	1169	541	98	1153	0	0	0	0	416	10	361
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1231	569	103	1214	0	0	0	0	438	11	380
RTOR Reduction (vph)	0	0	228	0	0	0	0	0	0	0	0	33
Lane Group Flow (vph)	0	1231	341	103	1214	0	0	0	0	219	230	347
Confl. Peds. (#/hr)							3		3			
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		2		1	6						4	
Permitted Phases			2							4		4
Actuated Green, G (s)		75.3	75.3	9.0	88.3					32.2	32.2	32.2
Effective Green, g (s)		77.8	77.8	10.0	90.8					33.2	33.2	33.2
Actuated g/C Ratio		0.60	0.60	0.08	0.70					0.26	0.26	0.26
Clearance Time (s)		5.5	5.5	4.0	5.5					4.0	4.0	4.0
Vehicle Extension (s)		4.0	4.0	3.0	4.0					3.0	3.0	3.0
Lane Grp Cap (vph)		3043	947	264	3552					429	431	404
v/s Ratio Prot		c0.24		c0.03	0.24							
v/s Ratio Perm			0.22							0.13	0.14	c0.22
v/c Ratio		0.40	0.36	0.39	0.34					0.51	0.53	0.86
Uniform Delay, d1		13.8	13.4	57.1	7.8					41.4	41.7	46.2
Progression Factor		0.66	1.52	1.27	0.39					1.00	1.00	1.00
Incremental Delay, d2		0.3	0.9	0.9	0.3					1.0	1.3	16.4
Delay (s)		9.4	21.2	73.5	3.3					42.5	43.0	62.6
Level of Service		A	C	E	A					D	D	E
Approach Delay (s)		13.2			8.8			0.0			51.9	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM Average Control Delay	19.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			
Lane Util. Factor		0.91	1.00	1.00	0.91	1.00	0.95	0.95	1.00			
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00			
Satd. Flow (prot)		5085	1583	1770	5085	1583	1681	1699	1583			
Flt Permitted		1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00			
Satd. Flow (perm)		5085	1583	1770	5085	1583	1681	1699	1583			
Volume (vph)	0	1404	264	21	831	357	437	43	137	0	0	0
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	1543	290	23	913	392	480	47	151	0	0	0
RTOR Reduction (vph)	0	0	87	0	0	93	0	0	122	0	0	0
Lane Group Flow (vph)	0	1543	203	23	913	299	257	270	29	0	0	0
Turn Type			Perm	Prot		Perm	Split		Perm			
Protected Phases		2		1	6		8	8				
Permitted Phases			2			6			8			
Actuated Green, G (s)		88.2	88.2	4.1	96.3	96.3	23.7	23.7	23.7			
Effective Green, g (s)		91.2	91.2	5.1	99.3	99.3	24.7	24.7	24.7			
Actuated g/C Ratio		0.70	0.70	0.04	0.76	0.76	0.19	0.19	0.19			
Clearance Time (s)		6.0	6.0	4.0	6.0	6.0	4.0	4.0	4.0			
Vehicle Extension (s)		4.0	4.0	2.0	4.0	4.0	2.0	2.0	2.0			
Lane Grp Cap (vph)		3567	1111	69	3884	1209	319	323	301			
v/s Ratio Prot		c0.30		c0.01	0.18		0.15	c0.16				
v/s Ratio Perm			0.13			0.19			0.02			
v/c Ratio		0.43	0.18	0.33	0.24	0.25	0.81	0.84	0.10			
Uniform Delay, d1		8.3	6.6	60.8	4.4	4.5	50.4	50.7	43.4			
Progression Factor		0.38	0.42	0.98	0.93	1.30	1.00	1.00	1.00			
Incremental Delay, d2		0.4	0.3	1.0	0.1	0.5	13.0	16.2	0.1			
Delay (s)		3.5	3.2	60.3	4.2	6.3	63.4	66.9	43.5			
Level of Service		A	A	E	A	A	E	E	D			
Approach Delay (s)		3.5			5.8			60.3			0.0	
Approach LOS		A			A			E			A	

Intersection Summary			
HCM Average Control Delay	14.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1549	1770	3539	1561	3433	3174		3433	1863	1561
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1549	1770	3539	1561	3433	3174		3433	1863	1561
Volume (vph)	217	892	256	160	803	55	51	76	167	114	67	101
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	231	949	272	170	854	59	54	81	178	121	71	107
RTOR Reduction (vph)	0	0	118	0	0	24	0	155	0	0	0	90
Lane Group Flow (vph)	231	949	154	170	854	35	54	104	0	121	71	17
Confl. Peds. (#/hr)	2		1	1		2	2					2
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	13.2	70.5	70.5	16.1	73.4	73.4	6.3	15.6		9.8	19.1	19.1
Effective Green, g (s)	14.2	73.5	73.5	17.1	76.4	76.4	7.3	16.6		10.8	20.1	20.1
Actuated g/C Ratio	0.11	0.57	0.57	0.13	0.59	0.59	0.06	0.13		0.08	0.15	0.15
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0	3.0	3.0	4.0		2.0	2.0	2.0
Lane Grp Cap (vph)	375	2875	876	233	2080	917	193	405		285	288	241
v/s Ratio Prot	0.07	0.19		c0.10	c0.24		c0.02	c0.03		c0.04	0.04	
v/s Ratio Perm			0.10			0.02						0.01
v/c Ratio	0.62	0.33	0.18	0.73	0.41	0.04	0.28	0.26		0.42	0.25	0.07
Uniform Delay, d1	55.3	15.1	13.6	54.2	14.6	11.3	58.8	51.1		56.6	48.3	47.0
Progression Factor	0.95	0.93	1.92	1.04	1.16	2.27	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.0	0.3	0.4	9.0	0.6	0.1	0.8	0.5		0.4	0.2	0.0
Delay (s)	55.6	14.4	26.6	65.2	17.5	25.8	59.6	51.6		57.0	48.5	47.0
Level of Service	E	B	C	E	B	C	E	D		E	D	D
Approach Delay (s)		23.2			25.4			53.0			51.4	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	29.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.97	1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1562	1770	3539	1540	3433	1863	1562	3433	3187	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1562	1770	3539	1540	3433	1863	1562	3433	3187	
Volume (vph)	230	759	112	53	702	129	76	46	36	231	115	176
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	235	774	114	54	716	132	78	47	37	236	117	180
RTOR Reduction (vph)	0	0	43	0	0	63	0	0	34	0	157	0
Lane Group Flow (vph)	235	774	71	54	716	69	78	47	3	236	140	0
Confl. Peds. (#/hr)	3		1	1		3	3		1	1		3
Turn Type	Prot		Perm	Prot		Perm	Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	20.6	80.4	80.4	7.0	66.8	66.8	10.9	10.9	10.9	15.7	15.7	
Effective Green, g (s)	21.6	81.4	81.4	8.0	67.8	67.8	11.9	11.9	11.9	16.7	16.7	
Actuated g/C Ratio	0.17	0.63	0.63	0.06	0.52	0.52	0.09	0.09	0.09	0.13	0.13	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	294	3184	978	109	1846	803	314	171	143	441	409	
v/s Ratio Prot	c0.13	0.15		0.03	c0.20		0.02	c0.03		c0.07	0.04	
v/s Ratio Perm			0.05			0.04			0.00			
v/c Ratio	0.80	0.24	0.07	0.50	0.39	0.09	0.25	0.27	0.02	0.54	0.34	
Uniform Delay, d1	52.1	10.7	9.5	59.0	18.7	15.6	54.9	55.0	53.8	53.0	51.6	
Progression Factor	1.36	0.57	0.30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	12.8	0.2	0.1	1.3	0.6	0.2	0.2	0.3	0.0	0.6	0.2	
Delay (s)	83.8	6.3	3.0	60.3	19.3	15.8	55.0	55.3	53.8	53.6	51.8	
Level of Service	F	A	A	E	B	B	E	E	D	D	D	
Approach Delay (s)		22.2			21.2			54.8			52.6	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	29.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.91	1.00	1.00	0.97	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1436	1770	3539	1531	3433	3347		2000	3498	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1436	1770	3539	1531	3433	3347		1770	3498	
Volume (vph)	87	780	147	151	497	154	192	365	168	168	191	14
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	90	804	152	156	512	159	198	376	173	173	197	14
RTOR Reduction (vph)	0	0	32	0	0	54	0	43	0	0	5	0
Lane Group Flow (vph)	90	804	120	156	512	105	198	506	0	173	206	0
Confl. Peds. (#/hr)	12		54	54		12	11		8	8		11
Confl. Bikes (#/hr)			11			9						
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	11.8	54.1	54.1	16.3	58.6	58.6	12.5	24.0		17.1	28.6	
Effective Green, g (s)	13.3	56.1	56.1	17.8	60.6	60.6	14.0	25.5		18.6	30.1	
Actuated g/C Ratio	0.10	0.43	0.43	0.14	0.47	0.47	0.11	0.20		0.14	0.23	
Clearance Time (s)	4.5	5.0	5.0	4.5	5.0	5.0	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	7.0	7.0	3.0	7.0	7.0	3.0	3.0		4.0	3.0	
Lane Grp Cap (vph)	181	1527	620	242	1650	714	370	657		286	810	
v/s Ratio Prot	0.05	c0.23		c0.09	0.14		0.06	c0.15		c0.09	0.06	
v/s Ratio Perm			0.08			0.07						
v/c Ratio	0.50	0.53	0.19	0.64	0.31	0.15	0.54	0.77		0.60	0.25	
Uniform Delay, d1	55.2	27.2	22.9	53.1	21.7	19.9	54.9	49.5		52.3	40.8	
Progression Factor	1.41	0.64	0.68	0.97	1.73	2.83	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	1.1	0.6	4.9	0.4	0.4	1.5	5.6		4.1	0.2	
Delay (s)	79.8	18.4	16.1	56.1	37.8	56.7	56.4	55.1		56.4	41.0	
Level of Service	E	B	B	E	D	E	E	E		E	D	
Approach Delay (s)		23.3			44.9			55.4			47.9	
Approach LOS		C			D			E			D	

Intersection Summary			
HCM Average Control Delay	40.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.95		0.91	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.96	1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (prot)	1770	3539	1521	1770	5085	1520	1770	3388		2000	3271	1533
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (perm)	1770	3539	1521	1770	5085	1520	1770	3388		1610	3271	1533
Volume (vph)	131	915	22	43	720	229	17	87	26	423	77	97
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	149	1040	25	49	818	260	19	99	30	481	88	110
RTOR Reduction (vph)	0	0	9	0	0	152	0	25	0	0	0	89
Lane Group Flow (vph)	149	1040	16	49	818	108	19	104	0	241	328	21
Confl. Peds. (#/hr)	18		20	20		18	14		16	16		14
Confl. Bikes (#/hr)			3			8			1			1
Turn Type	Prot		Perm	Prot		Perm	Split			Split		Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	17.3	64.7	64.7	5.2	52.1	52.1	17.4	17.4		23.2	23.2	23.2
Effective Green, g (s)	19.3	66.7	66.7	6.7	54.1	54.1	19.4	19.4		25.2	25.2	25.2
Actuated g/C Ratio	0.15	0.51	0.51	0.05	0.42	0.42	0.15	0.15		0.19	0.19	0.19
Clearance Time (s)	5.0	5.0	5.0	4.5	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	5.0	5.0	5.0	3.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lane Grp Cap (vph)	263	1816	780	91	2116	633	264	506		388	634	297
v/s Ratio Prot	c0.08	c0.29		0.03	0.16		0.01	c0.03		c0.12	0.10	
v/s Ratio Perm			0.01			0.07						0.01
v/c Ratio	0.57	0.57	0.02	0.54	0.39	0.17	0.07	0.21		0.62	0.52	0.07
Uniform Delay, d1	51.5	21.8	15.6	60.1	26.4	23.9	47.6	48.5		48.0	47.0	42.8
Progression Factor	0.87	0.61	0.35	1.14	0.87	0.99	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.1	1.2	0.0	5.2	0.5	0.5	0.2	0.4		4.3	1.4	0.2
Delay (s)	48.6	14.5	5.5	73.6	23.4	24.1	47.8	49.0		52.4	48.4	43.1
Level of Service	D	B	A	E	C	C	D	D		D	D	D
Approach Delay (s)		18.5			25.7			48.8			48.9	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM Average Control Delay	29.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.86		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5055		1770	5062		1767	1605		1770	1652	
Flt Permitted	0.95	1.00		0.95	1.00		0.74	1.00		0.40	1.00	
Satd. Flow (perm)	1770	5055		1770	5062		1372	1605		742	1652	
Volume (vph)	18	1282	44	121	931	24	35	10	114	42	9	20
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	19	1322	45	125	960	25	36	10	118	43	9	21
RTOR Reduction (vph)	0	2	0	0	1	0	0	105	0	0	19	0
Lane Group Flow (vph)	19	1365	0	125	984	0	36	23	0	43	11	0
Confl. Peds. (#/hr)	4		4	4		4	1					1
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	3.7	87.4		15.3	99.0		12.8	12.8		12.8	12.8	
Effective Green, g (s)	5.2	89.9		16.8	101.5		14.3	14.3		14.3	14.3	
Actuated g/C Ratio	0.04	0.69		0.13	0.78		0.11	0.11		0.11	0.11	
Clearance Time (s)	4.5	5.5		4.5	5.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	4.0	6.0		4.0	6.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	71	3496		229	3952		151	177		82	182	
v/s Ratio Prot	0.01	c0.27		c0.07	0.19			0.01			0.01	
v/s Ratio Perm							0.03			c0.06		
v/c Ratio	0.27	0.39		0.55	0.25		0.24	0.13		0.52	0.06	
Uniform Delay, d1	60.6	8.5		53.0	3.9		52.9	52.2		54.6	51.8	
Progression Factor	0.92	0.82		0.96	1.43		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.1	0.3		2.4	0.1		0.8	0.3		5.9	0.1	
Delay (s)	57.9	7.2		53.2	5.7		53.7	52.6		60.6	52.0	
Level of Service	E	A		D	A		D	D		E	D	
Approach Delay (s)		7.9			11.0			52.8			57.0	
Approach LOS		A			B			D			E	

Intersection Summary			
HCM Average Control Delay	13.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	56.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	0.93		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1690		1770	1710		1770	3442		1770	3427	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1690		1770	1710		1770	3442		1770	3427	
Volume (vph)	42	51	82	34	50	45	73	281	49	89	376	63
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	46	55	89	37	54	49	79	305	53	97	409	68
RTOR Reduction (vph)	0	36	0	0	20	0	0	5	0	0	5	0
Lane Group Flow (vph)	46	108	0	37	83	0	79	353	0	97	472	0
Confl. Peds. (#/hr)	10					10	20		7	7		20
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	12.3	12.3		9.4	9.4		8.9	69.2		9.9	70.2	
Effective Green, g (s)	12.8	12.8		9.9	9.9		9.4	70.7		10.4	71.7	
Actuated g/C Ratio	0.11	0.11		0.09	0.09		0.08	0.61		0.09	0.62	
Clearance Time (s)	3.5	3.5		3.5	3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	196	187		151	146		144	2101		159	2122	
v/s Ratio Prot	0.03	c0.06		0.02	c0.05		c0.04	0.10		c0.05	c0.14	
v/s Ratio Perm												
v/c Ratio	0.23	0.58		0.25	0.57		0.55	0.17		0.61	0.22	
Uniform Delay, d1	47.0	48.9		49.5	50.9		51.2	9.8		50.7	9.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	4.2		0.8	5.0		4.2	0.2		6.8	0.2	
Delay (s)	47.6	53.1		50.3	55.9		55.4	10.0		57.5	10.0	
Level of Service	D	D		D	E		E	A		E	A	
Approach Delay (s)		51.8			54.4			18.2			18.0	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM Average Control Delay	26.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	115.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1634		1768	1863	1583	1770	3539	1550	1770	3479	
Flt Permitted	0.75	1.00		0.74	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1400	1634		1374	1863	1583	1770	3539	1550	1770	3479	
Volume (vph)	17	7	22	35	9	133	27	302	39	162	459	50
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	17	7	22	36	9	136	28	308	40	165	468	51
RTOR Reduction (vph)	0	20	0	0	0	123	0	0	0	0	3	0
Lane Group Flow (vph)	17	9	0	36	9	13	28	308	40	165	516	0
Confl. Peds. (#/hr)			1	1			2		2	2		2
Turn Type	Perm			Perm		Perm	Prot		Free	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8			Free			
Actuated Green, G (s)	8.4	8.4		8.4	8.4	8.4	3.4	62.6	100.0	14.5	73.7	
Effective Green, g (s)	9.9	9.9		9.9	9.9	9.9	4.4	65.6	100.0	15.5	76.7	
Actuated g/C Ratio	0.10	0.10		0.10	0.10	0.10	0.04	0.66	1.00	0.16	0.77	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.5	3.5	3.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	139	162		136	184	157	78	2322	1550	274	2668	
v/s Ratio Prot		0.01			0.00		0.02	0.09		c0.09	c0.15	
v/s Ratio Perm	0.01			c0.03		0.01			0.03			
v/c Ratio	0.12	0.06		0.26	0.05	0.09	0.36	0.13	0.03	0.60	0.19	
Uniform Delay, d1	41.1	40.8		41.7	40.8	40.9	46.4	6.5	0.0	39.4	3.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.23	0.15	
Incremental Delay, d2	0.4	0.1		1.2	0.1	0.3	2.8	0.1	0.0	3.4	0.1	
Delay (s)	41.5	41.0		42.9	40.9	41.2	49.2	6.6	0.0	51.7	0.6	
Level of Service	D	D		D	D	D	D	A	A	D	A	
Approach Delay (s)		41.2			41.5			9.1			12.9	
Approach LOS		D			D			A			B	

Intersection Summary			
HCM Average Control Delay	16.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Near-Term No Project

FEHR & PEERS
TRANSPORTATION CONSULTANTS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	0.97	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	5085	1583	3433	1540	1504	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	5085	1583	3433	1540	1504	1770	1863	1583
Volume (vph)	29	971	65	211	1119	168	76	14	184	190	31	34
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	32	1079	72	234	1243	187	84	16	204	211	34	38
RTOR Reduction (vph)	0	0	17	0	0	65	0	95	95	0	0	33
Lane Group Flow (vph)	32	1079	55	234	1243	122	84	23	7	211	34	5
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	3.6	71.9	71.9	13.3	81.6	81.6	9.7	7.8	7.8	19.0	17.1	17.1
Effective Green, g (s)	4.6	74.9	74.9	14.3	84.6	84.6	10.7	8.8	8.8	20.0	18.1	18.1
Actuated g/C Ratio	0.04	0.58	0.58	0.11	0.65	0.65	0.08	0.07	0.07	0.15	0.14	0.14
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	6.0	6.0	2.0	2.0	2.0	2.0	6.0	6.0
Lane Grp Cap (vph)	63	2930	912	378	3309	1030	283	104	102	272	259	220
v/s Ratio Prot	0.02	c0.21		c0.07	c0.24		0.02	c0.01		c0.12	0.02	
v/s Ratio Perm			0.03			0.08			0.00			0.00
v/c Ratio	0.51	0.37	0.06	0.62	0.38	0.12	0.30	0.22	0.07	0.78	0.13	0.02
Uniform Delay, d1	61.6	14.8	12.1	55.2	10.5	8.6	56.1	57.4	56.8	52.8	49.1	48.3
Progression Factor	0.83	0.59	0.46	1.25	0.61	0.68	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.0	0.3	0.1	1.9	0.3	0.2	0.2	0.4	0.1	11.9	0.7	0.1
Delay (s)	53.2	9.0	5.7	71.2	6.7	6.0	56.3	57.7	56.9	64.7	49.7	48.4
Level of Service	D	A	A	E	A	A	E	E	E	E	D	D
Approach Delay (s)		10.0			15.7			57.1			60.7	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM Average Control Delay	21.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Util. Factor		0.91	1.00	0.97	0.91					0.95	0.95	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5085	1583	3433	5085					1681	1689	1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5085	1583	3433	5085					1681	1689	1583
Volume (vph)	0	848	483	72	1102	0	0	0	0	287	6	410
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	942	537	80	1224	0	0	0	0	319	7	456
RTOR Reduction (vph)	0	0	234	0	0	0	0	0	0	0	0	34
Lane Group Flow (vph)	0	942	303	80	1224	0	0	0	0	160	166	422
Confl. Peds. (#/hr)							2					
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		2		1	6						4	
Permitted Phases			2							4		4
Actuated Green, G (s)		70.8	70.8	7.0	81.8					38.7	38.7	38.7
Effective Green, g (s)		73.3	73.3	8.0	84.3					39.7	39.7	39.7
Actuated g/C Ratio		0.56	0.56	0.06	0.65					0.31	0.31	0.31
Clearance Time (s)		5.5	5.5	4.0	5.5					4.0	4.0	4.0
Vehicle Extension (s)		4.0	4.0	3.0	4.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2867	893	211	3297					513	516	483
v/s Ratio Prot		0.19		0.02	c0.24							
v/s Ratio Perm			0.19							0.10	0.10	c0.27
v/c Ratio		0.33	0.34	0.38	0.37					0.31	0.32	0.87
Uniform Delay, d1		15.2	15.3	58.6	10.6					34.7	34.8	42.8
Progression Factor		0.73	0.73	1.32	0.40					1.00	1.00	1.00
Incremental Delay, d2		0.3	1.0	1.1	0.3					0.3	0.4	15.9
Delay (s)		11.3	12.2	78.5	4.5					35.0	35.1	58.7
Level of Service		B	B	E	A					D	D	E
Approach Delay (s)		11.6			9.1			0.0			48.9	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM Average Control Delay	18.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			
Lane Util. Factor		0.91	1.00	1.00	0.91	1.00	0.95	0.95	1.00			
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00			
Satd. Flow (prot)		5085	1583	1770	5085	1583	1681	1696	1583			
Flt Permitted		1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00			
Satd. Flow (perm)		5085	1583	1770	5085	1583	1681	1696	1583			
Volume (vph)	0	792	307	8	738	245	418	29	79	0	0	0
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	0	890	345	9	829	275	470	33	89	0	0	0
RTOR Reduction (vph)	0	0	94	0	0	64	0	0	72	0	0	0
Lane Group Flow (vph)	0	890	251	9	829	211	245	258	17	0	0	0
Turn Type			Perm	Prot		Perm	Split		Perm			
Protected Phases		2		1	6		8	8				
Permitted Phases			2			6			8			
Actuated Green, G (s)		91.5	91.5	1.2	96.7	96.7	23.3	23.3	23.3			
Effective Green, g (s)		94.5	94.5	2.2	99.7	99.7	24.3	24.3	24.3			
Actuated g/C Ratio		0.73	0.73	0.02	0.77	0.77	0.19	0.19	0.19			
Clearance Time (s)		6.0	6.0	4.0	6.0	6.0	4.0	4.0	4.0			
Vehicle Extension (s)		4.0	4.0	2.0	4.0	4.0	2.0	2.0	2.0			
Lane Grp Cap (vph)		3696	1151	30	3900	1214	314	317	296			
v/s Ratio Prot		c0.18		c0.01	0.16		0.15	c0.15				
v/s Ratio Perm			0.16			0.13			0.01			
v/c Ratio		0.24	0.22	0.30	0.21	0.17	0.78	0.81	0.06			
Uniform Delay, d1		5.9	5.8	63.1	4.2	4.1	50.3	50.7	43.4			
Progression Factor		0.43	1.15	0.68	2.07	9.02	1.00	1.00	1.00			
Incremental Delay, d2		0.1	0.4	2.0	0.1	0.3	11.0	14.0	0.0			
Delay (s)		2.7	7.0	45.2	8.9	37.1	61.3	64.7	43.5			
Level of Service		A	A	D	A	D	E	E	D			
Approach Delay (s)		3.9			16.1			60.1			0.0	
Approach LOS		A			B			E			A	

Intersection Summary			
HCM Average Control Delay	19.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	34.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1549	1770	3539	1562	3433	3080		3433	1863	1563
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1549	1770	3539	1562	3433	3080		3433	1863	1563
Volume (vph)	74	614	91	54	904	29	39	47	191	42	35	24
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	82	682	101	60	1004	32	43	52	212	47	39	27
RTOR Reduction (vph)	0	0	34	0	0	10	0	185	0	0	0	24
Lane Group Flow (vph)	82	682	67	60	1004	22	43	79	0	47	39	3
Confl. Peds. (#/hr)	1		1	1		1	1		1	1		1
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	7.2	83.5	83.5	7.7	84.0	84.0	5.9	15.4		5.4	14.9	14.9
Effective Green, g (s)	8.2	86.5	86.5	8.7	87.0	87.0	6.9	16.4		6.4	15.9	15.9
Actuated g/C Ratio	0.06	0.67	0.67	0.07	0.67	0.67	0.05	0.13		0.05	0.12	0.12
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0	3.0	3.0	4.0		2.0	2.0	2.0
Lane Grp Cap (vph)	217	3383	1031	118	2368	1045	182	389		169	228	191
v/s Ratio Prot	0.02	0.13		c0.03	c0.28		c0.01	c0.03		c0.01	0.02	
v/s Ratio Perm			0.04			0.01						0.00
v/c Ratio	0.38	0.20	0.07	0.51	0.42	0.02	0.24	0.20		0.28	0.17	0.02
Uniform Delay, d1	58.5	8.4	7.6	58.6	9.9	7.2	59.0	50.9		59.6	51.1	50.2
Progression Factor	0.93	0.91	1.74	0.92	1.23	1.98	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.1	0.1	0.1	1.2	0.5	0.0	0.7	0.4		0.3	0.1	0.0
Delay (s)	55.4	7.8	13.3	55.3	12.7	14.3	59.7	51.3		59.9	51.3	50.2
Level of Service	E	A	B	E	B	B	E	D		E	D	D
Approach Delay (s)		13.0			15.1			52.5			54.6	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	21.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	58.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1562	1770	3539	1583	3433	1863	1562	3433	3145	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1562	1770	3539	1583	3433	1863	1562	3433	3145	
Volume (vph)	247	550	26	81	663	80	89	48	41	105	77	223
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	274	611	29	90	737	89	99	53	46	117	86	248
RTOR Reduction (vph)	0	0	10	0	0	43	0	0	43	0	222	0
Lane Group Flow (vph)	274	611	19	90	737	46	99	53	3	117	112	0
Confl. Peds. (#/hr)			1	1					1	1		
Turn Type	Prot		Perm	Prot		Perm	Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	26.8	82.5	82.5	10.8	66.5	66.5	8.0	8.0	8.0	12.7	12.7	
Effective Green, g (s)	27.8	83.5	83.5	11.8	67.5	67.5	9.0	9.0	9.0	13.7	13.7	
Actuated g/C Ratio	0.21	0.64	0.64	0.09	0.52	0.52	0.07	0.07	0.07	0.11	0.11	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	379	3266	1003	161	1838	822	238	129	108	362	331	
v/s Ratio Prot	c0.15	0.12		0.05	c0.21		c0.03	0.03		0.03	c0.04	
v/s Ratio Perm			0.01			0.03			0.00			
v/c Ratio	0.72	0.19	0.02	0.56	0.40	0.06	0.42	0.41	0.03	0.32	0.34	
Uniform Delay, d1	47.5	9.5	8.4	56.6	19.0	15.5	58.0	58.0	56.4	53.9	53.9	
Progression Factor	1.15	0.49	0.18	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.6	0.1	0.0	2.4	0.7	0.1	0.4	0.8	0.0	0.2	0.2	
Delay (s)	60.3	4.8	1.6	59.0	19.6	15.6	58.4	58.7	56.5	54.0	54.2	
Level of Service	E	A	A	E	B	B	E	E	E	D	D	
Approach Delay (s)		21.3			23.1			58.0			54.1	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM Average Control Delay	30.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.83	1.00	1.00	0.92	1.00	0.95		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1308	1770	3539	1454	3433	3150		2000	3508	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1308	1770	3539	1454	3433	3150		1770	3508	
Volume (vph)	35	689	164	228	921	185	298	245	174	353	457	17
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	39	774	184	256	1035	208	335	275	196	397	513	19
RTOR Reduction (vph)	0	0	48	0	0	36	0	102	0	0	2	0
Lane Group Flow (vph)	39	774	136	256	1035	172	335	369	0	397	530	0
Confl. Peds. (#/hr)	44		101	101		44	58		69	69		58
Confl. Bikes (#/hr)			31			15			13			5
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	7.3	33.7	33.7	23.2	49.6	49.6	17.5	24.3		30.3	37.1	
Effective Green, g (s)	8.8	35.7	35.7	24.7	51.6	51.6	19.0	25.8		31.8	38.6	
Actuated g/C Ratio	0.07	0.27	0.27	0.19	0.40	0.40	0.15	0.20		0.24	0.30	
Clearance Time (s)	4.5	5.0	5.0	4.5	5.0	5.0	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	7.0	7.0	3.0	7.0	7.0	3.0	3.0		4.0	3.0	
Lane Grp Cap (vph)	120	972	359	336	1405	577	502	625		489	1042	
v/s Ratio Prot	0.02	c0.22		c0.14	0.29		0.10	c0.12		c0.20	0.15	
v/s Ratio Perm			0.10			0.12						
v/c Ratio	0.33	0.80	0.38	0.76	0.74	0.30	0.67	0.59		0.81	0.51	
Uniform Delay, d1	57.8	43.8	38.2	49.9	33.4	26.8	52.5	47.3		46.3	37.8	
Progression Factor	1.18	1.24	1.57	1.08	0.54	0.32	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	6.3	2.8	6.0	2.1	0.8	3.3	1.5		10.4	0.4	
Delay (s)	69.7	60.6	62.7	59.7	20.2	9.4	55.9	48.8		56.7	38.2	
Level of Service	E	E	E	E	C	A	E	D		E	D	
Approach Delay (s)		61.3			25.4			51.7			46.1	
Approach LOS		E			C			D			D	

Intersection Summary			
HCM Average Control Delay	43.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		0.91	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.96	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00
Satd. Flow (prot)	1770	3539	1515	1770	3539	1519	1770	3421		1900	3275	1554
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00
Satd. Flow (perm)	1770	3539	1515	1770	3539	1519	1770	3421		1610	3275	1554
Volume (vph)	218	561	18	24	952	213	36	53	13	405	85	329
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	242	623	20	27	1058	237	40	59	14	450	94	366
RTOR Reduction (vph)	0	0	9	0	0	113	0	13	0	0	0	296
Lane Group Flow (vph)	242	623	11	27	1058	124	40	60	0	225	319	70
Confl. Peds. (#/hr)	18		20	20		18	5		10	10		5
Confl. Bikes (#/hr)			12			9						
Turn Type	Prot		Perm	Prot		Perm	Split			Split		Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	26.6	71.6	71.6	4.2	48.7	48.7	11.8	11.8		22.9	22.9	22.9
Effective Green, g (s)	28.6	73.6	73.6	5.7	50.7	50.7	13.8	13.8		24.9	24.9	24.9
Actuated g/C Ratio	0.22	0.57	0.57	0.04	0.39	0.39	0.11	0.11		0.19	0.19	0.19
Clearance Time (s)	5.0	5.0	5.0	4.5	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	5.0	5.0	5.0	3.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lane Grp Cap (vph)	389	2004	858	78	1380	592	188	363		364	627	298
v/s Ratio Prot	c0.14	0.18		0.02	c0.30		c0.02	0.02		c0.12	0.10	
v/s Ratio Perm			0.01			0.08						0.05
v/c Ratio	0.62	0.31	0.01	0.35	0.77	0.21	0.21	0.17		0.62	0.51	0.24
Uniform Delay, d1	45.8	14.8	12.3	60.3	34.5	26.3	53.1	52.9		48.2	47.1	44.5
Progression Factor	1.46	1.14	2.18	1.23	0.76	0.64	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.9	0.4	0.0	2.4	3.7	0.7	1.2	0.5		4.5	1.4	0.9
Delay (s)	70.9	17.3	26.9	76.6	29.9	17.5	54.3	53.3		52.7	48.4	45.3
Level of Service	E	B	C	E	C	B	D	D		D	D	D
Approach Delay (s)		32.2			28.7			53.7			48.2	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	36.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.87		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5057		1770	5061		1770	1612		1770	1661	
Flt Permitted	0.95	1.00		0.95	1.00		0.64	1.00		0.37	1.00	
Satd. Flow (perm)	1770	5057		1770	5061		1188	1612		696	1661	
Volume (vph)	20	884	30	59	1119	37	39	14	123	24	16	41
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	22	951	32	63	1203	40	42	15	132	26	17	44
RTOR Reduction (vph)	0	1	0	0	1	0	0	121	0	0	40	0
Lane Group Flow (vph)	22	982	0	63	1242	0	42	26	0	26	21	0
Confl. Peds. (#/hr)			1	1								
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	5.4	96.8		9.5	100.9		9.2	9.2		9.2	9.2	
Effective Green, g (s)	6.9	99.3		11.0	103.4		10.7	10.7		10.7	10.7	
Actuated g/C Ratio	0.05	0.76		0.08	0.80		0.08	0.08		0.08	0.08	
Clearance Time (s)	4.5	5.5		4.5	5.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	4.0	6.0		4.0	6.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	94	3863		150	4025		98	133		57	137	
v/s Ratio Prot	0.01	0.19		c0.04	c0.25			0.02			0.01	
v/s Ratio Perm							0.04			c0.04		
v/c Ratio	0.23	0.25		0.42	0.31		0.43	0.19		0.46	0.15	
Uniform Delay, d1	59.0	4.5		56.5	3.6		56.7	55.6		56.9	55.4	
Progression Factor	0.93	1.03		1.00	0.70		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	0.1		2.2	0.2		3.0	0.7		5.7	0.5	
Delay (s)	56.6	4.8		58.9	2.7		59.7	56.3		62.6	55.9	
Level of Service	E	A		E	A		E	E		E	E	
Approach Delay (s)		5.9			5.4			57.1			57.9	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM Average Control Delay	11.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.92		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1665		1770	1691		1770	3483		1770	3495	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1665		1770	1691		1770	3483		1770	3495	
Volume (vph)	44	77	143	84	93	117	70	384	31	63	623	26
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	49	86	159	93	103	130	78	427	34	70	692	29
RTOR Reduction (vph)	0	39	0	0	26	0	0	2	0	0	1	0
Lane Group Flow (vph)	49	206	0	93	207	0	78	459	0	70	720	0
Confl. Peds. (#/hr)	3		2	2		3	45		16	16		45
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	21.0	21.0		20.6	20.6		9.5	66.4		9.5	66.4	
Effective Green, g (s)	21.5	21.5		21.1	21.1		10.0	67.9		10.0	67.9	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.08	0.51		0.08	0.51	
Clearance Time (s)	3.5	3.5		3.5	3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	287	270		282	269		134	1785		134	1791	
v/s Ratio Prot	0.03	c0.12		0.05	c0.12		c0.04	0.13		c0.04	c0.21	
v/s Ratio Perm												
v/c Ratio	0.17	0.76		0.33	0.77		0.58	0.26		0.52	0.40	
Uniform Delay, d1	47.8	53.1		49.4	53.4		59.2	18.1		59.0	19.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	12.0		0.7	12.4		6.3	0.3		3.6	0.7	
Delay (s)	48.1	65.0		50.1	65.8		65.5	18.5		62.6	20.5	
Level of Service	D	E		D	E		E	B		E	C	
Approach Delay (s)		62.2			61.3			25.3			24.2	
Approach LOS		E			E			C			C	

Intersection Summary			
HCM Average Control Delay	36.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	132.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1661		1767	1863	1583	1770	3539	1545	1770	3473	
Flt Permitted	0.69	1.00		0.46	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1280	1661		855	1863	1583	1770	3539	1545	1770	3473	
Volume (vph)	150	50	100	48	67	155	67	459	25	74	561	80
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	169	56	112	54	75	174	75	516	28	83	630	90
RTOR Reduction (vph)	0	91	0	0	0	142	0	0	0	0	7	0
Lane Group Flow (vph)	169	77	0	54	75	32	75	516	28	83	713	0
Confl. Peds. (#/hr)			2	2					9	9		
Turn Type	Perm			Perm		Perm	Prot		Free	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8			Free			
Actuated Green, G (s)	16.9	16.9		16.9	16.9	16.9	8.3	59.8	100.0	8.8	60.3	
Effective Green, g (s)	18.4	18.4		18.4	18.4	18.4	9.3	62.8	100.0	9.8	63.3	
Actuated g/C Ratio	0.18	0.18		0.18	0.18	0.18	0.09	0.63	1.00	0.10	0.63	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.5	3.5	3.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	236	306		157	343	291	165	2222	1545	173	2198	
v/s Ratio Prot		0.05			0.04		0.04	0.15		c0.05	c0.21	
v/s Ratio Perm	c0.13			0.06		0.02			c0.02			
v/c Ratio	0.72	0.25		0.34	0.22	0.11	0.45	0.23	0.02	0.48	0.32	
Uniform Delay, d1	38.3	34.9		35.5	34.7	34.0	42.9	8.1	0.0	42.7	8.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.14	0.44	
Incremental Delay, d2	9.9	0.4		1.6	0.4	0.2	2.0	0.2	0.0	2.0	0.4	
Delay (s)	48.2	35.3		37.1	35.1	34.2	44.9	8.3	0.0	50.6	4.1	
Level of Service	D	D		D	D	C	D	A	A	D	A	
Approach Delay (s)		41.8			34.9			12.4			8.9	
Approach LOS		D			C			B			A	

Intersection Summary			
HCM Average Control Delay	19.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	0.97	0.95	0.95	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1562	3433	5085	1547	3433	1595	1504	1770	1863	1558
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1562	3433	5085	1547	3433	1595	1504	1770	1863	1558
Volume (vph)	54	1586	100	480	1256	253	110	55	262	175	56	22
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	56	1652	104	500	1308	264	115	57	273	182	58	23
RTOR Reduction (vph)	0	0	22	0	0	106	0	66	142	0	0	20
Lane Group Flow (vph)	56	1652	82	500	1308	158	115	101	21	182	58	3
Confl. Peds. (#/hr)	1		1	1		1	4					4
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	8.0	58.8	58.8	23.9	74.7	74.7	11.8	15.4	15.4	13.9	17.5	17.5
Effective Green, g (s)	9.0	61.8	61.8	24.9	77.7	77.7	12.8	16.4	16.4	14.9	18.5	18.5
Actuated g/C Ratio	0.07	0.48	0.48	0.19	0.60	0.60	0.10	0.13	0.13	0.11	0.14	0.14
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	6.0	6.0	2.0	2.0	2.0	2.0	6.0	6.0
Lane Grp Cap (vph)	123	2417	743	658	3039	925	338	201	190	203	265	222
v/s Ratio Prot	0.03	c0.32		c0.15	0.26		0.03	c0.06		c0.10	0.03	
v/s Ratio Perm			0.05			0.10			0.01			0.00
v/c Ratio	0.46	0.68	0.11	0.76	0.43	0.17	0.34	0.50	0.11	0.90	0.22	0.01
Uniform Delay, d1	58.1	26.5	18.9	49.7	14.2	11.7	54.7	53.0	50.3	56.8	49.4	47.9
Progression Factor	0.88	0.76	0.91	1.28	0.64	1.09	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	1.2	0.2	3.6	0.4	0.3	0.2	0.7	0.1	35.1	1.2	0.1
Delay (s)	51.8	21.4	17.4	67.3	9.5	13.1	54.9	53.7	50.4	91.9	50.5	48.0
Level of Service	D	C	B	E	A	B	D	D	D	F	D	D
Approach Delay (s)		22.1			23.9			52.8			78.9	
Approach LOS		C			C			D			E	

Intersection Summary			
HCM Average Control Delay	29.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Util. Factor		0.91	1.00	0.97	0.91					0.95	0.95	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5085	1583	3433	5085					1681	1689	1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5085	1583	3433	5085					1681	1689	1583
Volume (vph)	0	1419	612	98	1440	0	0	0	0	416	10	539
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1494	644	103	1516	0	0	0	0	438	11	567
RTOR Reduction (vph)	0	0	341	0	0	0	0	0	0	0	0	12
Lane Group Flow (vph)	0	1494	303	103	1516	0	0	0	0	219	230	555
Confl. Peds. (#/hr)							3		3			
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		2		1	6						4	
Permitted Phases			2							4		4
Actuated Green, G (s)		58.6	58.6	8.8	71.4					49.1	49.1	49.1
Effective Green, g (s)		61.1	61.1	9.8	73.9					50.1	50.1	50.1
Actuated g/C Ratio		0.47	0.47	0.08	0.57					0.39	0.39	0.39
Clearance Time (s)		5.5	5.5	4.0	5.5					4.0	4.0	4.0
Vehicle Extension (s)		4.0	4.0	3.0	4.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2390	744	259	2891					648	651	610
v/s Ratio Prot		c0.29		0.03	c0.30							
v/s Ratio Perm			0.19							0.13	0.14	c0.35
v/c Ratio		0.63	0.41	0.40	0.52					0.34	0.35	0.91
Uniform Delay, d1		25.9	22.6	57.3	17.2					28.2	28.4	37.8
Progression Factor		0.58	1.48	1.11	0.53					1.00	1.00	1.00
Incremental Delay, d2		1.0	1.3	0.9	0.6					0.3	0.3	17.8
Delay (s)		15.9	34.7	64.5	9.8					28.5	28.8	55.6
Level of Service		B	C	E	A					C	C	E
Approach Delay (s)		21.6			13.2			0.0			43.7	
Approach LOS		C			B			A			D	

Intersection Summary			
HCM Average Control Delay	23.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			
Lane Util. Factor		0.91	1.00	1.00	0.91	1.00	0.95	0.95	1.00			
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00			
Satd. Flow (prot)		5085	1583	1770	5085	1583	1681	1697	1583			
Flt Permitted		0.94	1.00	0.95	1.00	1.00	0.95	0.96	1.00			
Satd. Flow (perm)		4763	1583	1770	5085	1583	1681	1697	1583			
Volume (vph)	5	1540	373	21	1014	357	541	43	137	0	0	0
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	5	1692	410	23	1114	392	595	47	151	0	0	0
RTOR Reduction (vph)	0	0	125	0	0	107	0	0	117	0	0	0
Lane Group Flow (vph)	0	1697	285	23	1114	285	313	329	34	0	0	0
Turn Type	Perm		Perm	Prot		Perm	Split		Perm			
Protected Phases		2		1	6		8	8				
Permitted Phases	2		2			6			8			
Actuated Green, G (s)		83.3	83.3	4.2	91.5	91.5	28.5	28.5	28.5			
Effective Green, g (s)		86.3	86.3	5.2	94.5	94.5	29.5	29.5	29.5			
Actuated g/C Ratio		0.66	0.66	0.04	0.73	0.73	0.23	0.23	0.23			
Clearance Time (s)		6.0	6.0	4.0	6.0	6.0	4.0	4.0	4.0			
Vehicle Extension (s)		4.0	4.0	2.0	4.0	4.0	2.0	2.0	2.0			
Lane Grp Cap (vph)		3162	1051	71	3696	1151	381	385	359			
v/s Ratio Prot				0.01	c0.22		0.19	c0.19				
v/s Ratio Perm		c0.36	0.18			0.18			0.02			
v/c Ratio		0.54	0.27	0.32	0.30	0.25	0.82	0.85	0.10			
Uniform Delay, d1		11.4	9.0	60.7	6.2	5.9	47.7	48.2	39.7			
Progression Factor		0.22	0.00	0.87	1.04	1.76	1.00	1.00	1.00			
Incremental Delay, d2		0.6	0.6	0.9	0.2	0.5	12.7	16.1	0.0			
Delay (s)		3.1	0.6	53.9	6.6	10.9	60.4	64.3	39.7			
Level of Service		A	A	D	A	B	E	E	D			
Approach Delay (s)		2.6			8.4			58.1			0.0	
Approach LOS		A			A			E			A	

Intersection Summary			
HCM Average Control Delay	14.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	78.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1549	1770	3539	1561	3433	3174		3433	1863	1561
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1549	1770	3539	1561	3433	3174		3433	1863	1561
Volume (vph)	217	1028	256	160	986	55	51	76	167	114	67	101
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	231	1094	272	170	1049	59	54	81	178	121	71	107
RTOR Reduction (vph)	0	0	118	0	0	21	0	155	0	0	0	90
Lane Group Flow (vph)	231	1094	154	170	1049	38	54	104	0	121	71	17
Confl. Peds. (#/hr)	2		1	1		2	2					2
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	13.2	70.5	70.5	16.1	73.4	73.4	6.3	15.6		9.8	19.1	19.1
Effective Green, g (s)	14.2	73.5	73.5	17.1	76.4	76.4	7.3	16.6		10.8	20.1	20.1
Actuated g/C Ratio	0.11	0.57	0.57	0.13	0.59	0.59	0.06	0.13		0.08	0.15	0.15
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0	3.0	3.0	4.0		2.0	2.0	2.0
Lane Grp Cap (vph)	375	2875	876	233	2080	917	193	405		285	288	241
v/s Ratio Prot	0.07	0.22		c0.10	c0.30		c0.02	c0.03		c0.04	0.04	
v/s Ratio Perm			0.10			0.02						0.01
v/c Ratio	0.62	0.38	0.18	0.73	0.50	0.04	0.28	0.26		0.42	0.25	0.07
Uniform Delay, d1	55.3	15.6	13.6	54.2	15.7	11.3	58.8	51.1		56.6	48.3	47.0
Progression Factor	1.06	0.85	1.50	0.98	1.13	1.99	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.0	0.4	0.4	8.7	0.8	0.1	0.8	0.5		0.4	0.2	0.0
Delay (s)	61.4	13.8	20.8	61.9	18.6	22.6	59.6	51.6		57.0	48.5	47.0
Level of Service	E	B	C	E	B	C	E	D		E	D	D
Approach Delay (s)		21.8			24.6			53.0			51.4	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	28.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.97	1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1562	1770	3539	1540	3433	1863	1562	3433	3124	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1562	1770	3539	1540	3433	1863	1562	3433	3124	
Volume (vph)	316	809	112	53	772	129	76	46	36	231	115	289
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	322	826	114	54	788	132	78	47	37	236	117	295
RTOR Reduction (vph)	0	0	43	0	0	73	0	0	34	0	257	0
Lane Group Flow (vph)	322	826	71	54	788	59	78	47	3	236	155	0
Confl. Peds. (#/hr)	3		1	1		3	3		1	1		3
Turn Type	Prot		Perm	Prot		Perm	Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	30.6	80.4	80.4	7.0	56.8	56.8	10.9	10.9	10.9	15.7	15.7	
Effective Green, g (s)	31.6	81.4	81.4	8.0	57.8	57.8	11.9	11.9	11.9	16.7	16.7	
Actuated g/C Ratio	0.24	0.63	0.63	0.06	0.44	0.44	0.09	0.09	0.09	0.13	0.13	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	430	3184	978	109	1573	685	314	171	143	441	401	
v/s Ratio Prot	c0.18	0.16		0.03	c0.22		0.02	c0.03		c0.07	0.05	
v/s Ratio Perm			0.05			0.04			0.00			
v/c Ratio	0.75	0.26	0.07	0.50	0.50	0.09	0.25	0.27	0.02	0.54	0.39	
Uniform Delay, d1	45.5	10.8	9.5	59.0	25.8	20.8	54.9	55.0	53.8	53.0	52.0	
Progression Factor	1.57	0.59	0.36	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.9	0.2	0.1	1.3	1.1	0.2	0.2	0.3	0.0	0.6	0.2	
Delay (s)	77.1	6.6	3.5	60.3	26.9	21.1	55.0	55.3	53.8	53.6	52.2	
Level of Service	E	A	A	E	C	C	E	E	D	D	D	
Approach Delay (s)		24.3			28.0			54.8			52.7	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	33.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.91	1.00	1.00	0.97	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1435	1770	3539	1531	3433	3297		2000	3498	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1435	1770	3539	1531	3433	3297		1770	3498	
Volume (vph)	87	903	169	238	588	154	205	365	241	168	191	14
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	90	931	174	245	606	159	211	376	248	173	197	14
RTOR Reduction (vph)	0	0	34	0	0	46	0	87	0	0	5	0
Lane Group Flow (vph)	90	931	140	245	606	113	211	537	0	173	206	0
Confl. Peds. (#/hr)	12		54	54		12	11		8	8		11
Confl. Bikes (#/hr)			11			9						
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	11.8	48.0	48.0	21.3	57.5	57.5	12.9	25.1		17.1	29.3	
Effective Green, g (s)	13.3	50.0	50.0	22.8	59.5	59.5	14.4	26.6		18.6	30.8	
Actuated g/C Ratio	0.10	0.38	0.38	0.18	0.46	0.46	0.11	0.20		0.14	0.24	
Clearance Time (s)	4.5	5.0	5.0	4.5	5.0	5.0	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	7.0	7.0	3.0	7.0	7.0	3.0	3.0		4.0	3.0	
Lane Grp Cap (vph)	181	1361	552	310	1620	701	380	675		286	829	
v/s Ratio Prot	0.05	c0.26		c0.14	0.17		0.06	c0.16		c0.09	0.06	
v/s Ratio Perm			0.10			0.07						
v/c Ratio	0.50	0.68	0.25	0.79	0.37	0.16	0.56	0.79		0.60	0.25	
Uniform Delay, d1	55.2	33.4	27.3	51.3	23.1	20.6	54.8	49.1		52.3	40.2	
Progression Factor	1.42	0.60	0.60	1.06	1.69	2.52	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	2.4	1.0	11.0	0.6	0.4	1.8	6.4		4.1	0.2	
Delay (s)	80.1	22.5	17.4	65.3	39.5	52.5	56.5	55.5		56.4	40.4	
Level of Service	F	C	B	E	D	D	E	E		E	D	
Approach Delay (s)		26.1			47.8			55.8			47.6	
Approach LOS		C			D			E			D	

Intersection Summary			
HCM Average Control Delay	42.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.95		0.91	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.96	1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (prot)	1770	3539	1521	1770	5085	1519	1770	3388		2000	3263	1534
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (perm)	1770	3539	1521	1770	5085	1519	1770	3388		1610	3263	1534
Volume (vph)	232	1029	22	43	868	369	17	87	26	551	77	153
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	264	1169	25	49	986	419	19	99	30	626	88	174
RTOR Reduction (vph)	0	0	9	0	0	272	0	25	0	0	0	137
Lane Group Flow (vph)	264	1169	16	49	986	147	19	104	0	313	401	37
Confl. Peds. (#/hr)	18		20	20		18	14		16	16		14
Confl. Bikes (#/hr)			3			8			1			1
Turn Type	Prot		Perm	Prot		Perm	Split			Split		Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	23.2	62.0	62.0	5.2	43.5	43.5	17.4	17.4		25.9	25.9	25.9
Effective Green, g (s)	25.2	64.0	64.0	6.7	45.5	45.5	19.4	19.4		27.9	27.9	27.9
Actuated g/C Ratio	0.19	0.49	0.49	0.05	0.35	0.35	0.15	0.15		0.21	0.21	0.21
Clearance Time (s)	5.0	5.0	5.0	4.5	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	5.0	5.0	5.0	3.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lane Grp Cap (vph)	343	1742	749	91	1780	532	264	506		429	700	329
v/s Ratio Prot	c0.15	c0.33		0.03	0.19		0.01	c0.03		c0.16	0.12	
v/s Ratio Perm			0.01			0.10						0.02
v/c Ratio	0.77	0.67	0.02	0.54	0.55	0.28	0.07	0.21		0.73	0.87dl	0.11
Uniform Delay, d1	49.7	25.0	16.9	60.1	34.1	30.4	47.6	48.5		47.5	45.7	41.1
Progression Factor	0.80	0.70	0.35	1.13	0.89	1.16	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	10.7	1.9	0.0	5.2	1.1	1.1	0.2	0.4		7.5	1.8	0.3
Delay (s)	50.2	19.5	5.9	73.4	31.2	36.3	47.8	49.0		55.0	47.5	41.4
Level of Service	D	B	A	E	C	D	D	D		E	D	D
Approach Delay (s)		24.8			34.1			48.8			49.0	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	34.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.86		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5060		1770	5067		1767	1605		1770	1652	
Flt Permitted	0.95	1.00		0.95	1.00		0.74	1.00		0.40	1.00	
Satd. Flow (perm)	1770	5060		1770	5067		1372	1605		742	1652	
Volume (vph)	18	1542	44	121	1222	24	35	10	114	42	9	20
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	19	1590	45	125	1260	25	36	10	118	43	9	21
RTOR Reduction (vph)	0	1	0	0	1	0	0	105	0	0	19	0
Lane Group Flow (vph)	19	1634	0	125	1284	0	36	23	0	43	11	0
Confl. Peds. (#/hr)	4		4	4		4	1					1
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	3.7	87.4		15.3	99.0		12.8	12.8		12.8	12.8	
Effective Green, g (s)	5.2	89.9		16.8	101.5		14.3	14.3		14.3	14.3	
Actuated g/C Ratio	0.04	0.69		0.13	0.78		0.11	0.11		0.11	0.11	
Clearance Time (s)	4.5	5.5		4.5	5.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	4.0	6.0		4.0	6.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	71	3499		229	3956		151	177		82	182	
v/s Ratio Prot	0.01	c0.32		c0.07	0.25			0.01			0.01	
v/s Ratio Perm							0.03			c0.06		
v/c Ratio	0.27	0.47		0.55	0.32		0.24	0.13		0.52	0.06	
Uniform Delay, d1	60.6	9.1		53.0	4.2		52.9	52.2		54.6	51.8	
Progression Factor	0.91	0.80		0.89	1.56		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.1	0.3		2.4	0.2		0.8	0.3		5.9	0.1	
Delay (s)	57.5	7.7		49.7	6.7		53.7	52.6		60.6	52.0	
Level of Service	E	A		D	A		D	D		E	D	
Approach Delay (s)		8.3			10.5			52.8			57.0	
Approach LOS		A			B			D			E	

Intersection Summary			
HCM Average Control Delay	12.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	0.93		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1690		1770	1710		1770	3482		1770	3458	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1690		1770	1710		1770	3482		1770	3458	
Volume (vph)	42	51	82	34	50	45	73	514	49	89	543	63
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	46	55	89	37	54	49	79	559	53	97	590	68
RTOR Reduction (vph)	0	36	0	0	20	0	0	2	0	0	3	0
Lane Group Flow (vph)	46	108	0	37	83	0	79	610	0	97	655	0
Confl. Peds. (#/hr)	10					10	20		7	7		20
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	12.3	12.3		9.4	9.4		8.9	69.2		9.9	70.2	
Effective Green, g (s)	12.8	12.8		9.9	9.9		9.4	70.7		10.4	71.7	
Actuated g/C Ratio	0.11	0.11		0.09	0.09		0.08	0.61		0.09	0.62	
Clearance Time (s)	3.5	3.5		3.5	3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	196	187		151	146		144	2126		159	2141	
v/s Ratio Prot	0.03	c0.06		0.02	c0.05		c0.04	0.18		c0.05	c0.19	
v/s Ratio Perm												
v/c Ratio	0.23	0.58		0.25	0.57		0.55	0.29		0.61	0.31	
Uniform Delay, d1	47.0	48.9		49.5	50.9		51.2	10.6		50.7	10.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	4.2		0.8	5.0		4.2	0.3		6.8	0.4	
Delay (s)	47.6	53.1		50.3	55.9		55.4	11.0		57.5	10.7	
Level of Service	D	D		D	E		E	B		E	B	
Approach Delay (s)		51.8			54.4			16.1			16.7	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM Average Control Delay	23.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	115.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1634		1768	1863	1583	1770	3539	1550	1770	3494	
Flt Permitted	0.75	1.00		0.74	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1400	1634		1374	1863	1583	1770	3539	1550	1770	3494	
Volume (vph)	17	7	22	35	9	133	27	535	39	162	626	50
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	17	7	22	36	9	136	28	546	40	165	639	51
RTOR Reduction (vph)	0	20	0	0	0	123	0	0	0	0	2	0
Lane Group Flow (vph)	17	9	0	36	9	13	28	546	40	165	688	0
Confl. Peds. (#/hr)			1	1			2		2	2		2
Turn Type	Perm			Perm		Perm	Prot		Free	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8			Free			
Actuated Green, G (s)	8.4	8.4		8.4	8.4	8.4	3.4	62.6	100.0	14.5	73.7	
Effective Green, g (s)	9.9	9.9		9.9	9.9	9.9	4.4	65.6	100.0	15.5	76.7	
Actuated g/C Ratio	0.10	0.10		0.10	0.10	0.10	0.04	0.66	1.00	0.16	0.77	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.5	3.5	3.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	139	162		136	184	157	78	2322	1550	274	2680	
v/s Ratio Prot		0.01			0.00		0.02	0.15		c0.09	c0.20	
v/s Ratio Perm	0.01			c0.03		0.01			0.03			
v/c Ratio	0.12	0.06		0.26	0.05	0.09	0.36	0.24	0.03	0.60	0.26	
Uniform Delay, d1	41.1	40.8		41.7	40.8	40.9	46.4	7.0	0.0	39.4	3.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.22	0.16	
Incremental Delay, d2	0.4	0.1		1.2	0.1	0.3	2.8	0.2	0.0	3.4	0.2	
Delay (s)	41.5	41.0		42.9	40.9	41.2	49.2	7.2	0.0	51.6	0.7	
Level of Service	D	D		D	D	D	D	A	A	D	A	
Approach Delay (s)		41.2			41.5			8.7			10.6	
Approach LOS		D			D			A			B	

Intersection Summary			
HCM Average Control Delay	14.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Near-Term With Project

FEHR & PEERS
TRANSPORTATION CONSULTANTS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	0.97	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	5085	1583	3433	1540	1504	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	5085	1583	3433	1540	1504	1770	1863	1583
Volume (vph)	49	971	65	211	1119	233	76	14	184	386	31	94
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	54	1079	72	234	1243	259	84	16	204	429	34	104
RTOR Reduction (vph)	0	0	19	0	0	103	0	96	96	0	0	83
Lane Group Flow (vph)	54	1079	53	234	1243	156	84	22	6	429	34	21
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	4.8	66.9	66.9	13.2	75.3	75.3	6.6	6.9	6.9	25.0	25.3	25.3
Effective Green, g (s)	5.8	69.9	69.9	14.2	78.3	78.3	7.6	7.9	7.9	26.0	26.3	26.3
Actuated g/C Ratio	0.04	0.54	0.54	0.11	0.60	0.60	0.06	0.06	0.06	0.20	0.20	0.20
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	6.0	6.0	2.0	2.0	2.0	2.0	6.0	6.0
Lane Grp Cap (vph)	79	2734	851	375	3063	953	201	94	91	354	377	320
v/s Ratio Prot	c0.03	0.21		c0.07	c0.24		0.02	c0.01		c0.24	0.02	
v/s Ratio Perm			0.03			0.10			0.00			0.01
v/c Ratio	0.68	0.39	0.06	0.62	0.41	0.16	0.42	0.24	0.07	1.21	0.09	0.07
Uniform Delay, d1	61.2	17.6	14.4	55.3	13.6	11.4	59.1	58.2	57.6	52.0	42.1	41.9
Progression Factor	0.83	0.58	0.43	1.23	0.61	0.79	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.5	0.4	0.1	2.1	0.4	0.3	0.5	0.5	0.1	118.7	0.3	0.2
Delay (s)	66.5	10.7	6.3	70.3	8.7	9.3	59.6	58.6	57.7	170.7	42.4	42.2
Level of Service	E	B	A	E	A	A	E	E	E	F	D	D
Approach Delay (s)		12.9			17.1			58.6			139.4	
Approach LOS		B			B			E			F	

Intersection Summary			
HCM Average Control Delay	37.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Util. Factor		0.91	1.00	0.97	0.91					0.95	0.95	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5085	1583	3433	5085					1681	1689	1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5085	1583	3433	5085					1681	1689	1583
Volume (vph)	0	998	528	72	1142	0	0	0	0	287	6	435
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1109	587	80	1269	0	0	0	0	319	7	483
RTOR Reduction (vph)	0	0	266	0	0	0	0	0	0	0	0	30
Lane Group Flow (vph)	0	1109	321	80	1269	0	0	0	0	160	166	453
Confl. Peds. (#/hr)							2					
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		2		1	6						4	
Permitted Phases			2							4		4
Actuated Green, G (s)		68.5	68.5	7.0	79.5					41.0	41.0	41.0
Effective Green, g (s)		71.0	71.0	8.0	82.0					42.0	42.0	42.0
Actuated g/C Ratio		0.55	0.55	0.06	0.63					0.32	0.32	0.32
Clearance Time (s)		5.5	5.5	4.0	5.5					4.0	4.0	4.0
Vehicle Extension (s)		4.0	4.0	3.0	4.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2777	865	211	3207					543	546	511
v/s Ratio Prot		0.22		0.02	c0.25							
v/s Ratio Perm			0.20							0.10	0.10	c0.29
v/c Ratio		0.40	0.37	0.38	0.40					0.29	0.30	0.89
Uniform Delay, d1		17.1	16.8	58.6	11.8					32.9	33.0	41.7
Progression Factor		0.83	1.33	1.30	0.40					1.00	1.00	1.00
Incremental Delay, d2		0.4	1.0	1.1	0.4					0.3	0.3	16.8
Delay (s)		14.5	23.3	77.4	5.1					33.2	33.3	58.5
Level of Service		B	C	E	A					C	C	E
Approach Delay (s)		17.5			9.4			0.0			48.4	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM Average Control Delay	21.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			
Lane Util. Factor		0.91	1.00	1.00	0.91	1.00	0.95	0.95	1.00			
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00			
Satd. Flow (prot)		5085	1583	1770	5085	1583	1681	1695	1583			
Flt Permitted		1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00			
Satd. Flow (perm)		5085	1583	1770	5085	1583	1681	1695	1583			
Volume (vph)	0	867	382	8	763	245	433	29	79	0	0	0
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	0	974	429	9	857	275	487	33	89	0	0	0
RTOR Reduction (vph)	0	0	119	0	0	66	0	0	72	0	0	0
Lane Group Flow (vph)	0	974	310	9	857	209	253	267	17	0	0	0
Turn Type			Perm	Prot		Perm	Split		Perm			
Protected Phases		2		1	6		8	8				
Permitted Phases			2			6			8			
Actuated Green, G (s)		90.8	90.8	1.2	96.0	96.0	24.0	24.0	24.0			
Effective Green, g (s)		93.8	93.8	2.2	99.0	99.0	25.0	25.0	25.0			
Actuated g/C Ratio		0.72	0.72	0.02	0.76	0.76	0.19	0.19	0.19			
Clearance Time (s)		6.0	6.0	4.0	6.0	6.0	4.0	4.0	4.0			
Vehicle Extension (s)		4.0	4.0	2.0	4.0	4.0	2.0	2.0	2.0			
Lane Grp Cap (vph)		3669	1142	30	3872	1206	323	326	304			
v/s Ratio Prot		0.19		c0.01	0.17		0.15	c0.16				
v/s Ratio Perm			c0.20			0.13			0.01			
v/c Ratio		0.27	0.27	0.30	0.22	0.17	0.78	0.82	0.06			
Uniform Delay, d1		6.2	6.3	63.1	4.4	4.3	49.9	50.3	42.9			
Progression Factor		0.45	1.92	0.66	1.91	7.79	1.00	1.00	1.00			
Incremental Delay, d2		0.2	0.6	2.0	0.1	0.3	10.9	14.0	0.0			
Delay (s)		3.0	12.6	43.8	8.6	33.5	60.8	64.4	42.9			
Level of Service		A	B	D	A	C	E	E	D			
Approach Delay (s)		5.9			14.9			59.7			0.0	
Approach LOS		A			B			E			A	

Intersection Summary			
HCM Average Control Delay	19.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	36.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1549	1770	3539	1562	3433	3080		3433	1863	1563
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1549	1770	3539	1562	3433	3080		3433	1863	1563
Volume (vph)	74	689	91	54	929	29	39	47	191	42	35	24
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	82	766	101	60	1032	32	43	52	212	47	39	27
RTOR Reduction (vph)	0	0	34	0	0	9	0	185	0	0	0	24
Lane Group Flow (vph)	82	766	67	60	1032	23	43	79	0	47	39	3
Confl. Peds. (#/hr)	1		1	1		1	1		1	1		1
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	7.2	83.5	83.5	7.7	84.0	84.0	5.9	15.4		5.4	14.9	14.9
Effective Green, g (s)	8.2	86.5	86.5	8.7	87.0	87.0	6.9	16.4		6.4	15.9	15.9
Actuated g/C Ratio	0.06	0.67	0.67	0.07	0.67	0.67	0.05	0.13		0.05	0.12	0.12
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0	3.0	3.0	4.0		2.0	2.0	2.0
Lane Grp Cap (vph)	217	3383	1031	118	2368	1045	182	389		169	228	191
v/s Ratio Prot	0.02	0.15		c0.03	c0.29		c0.01	c0.03		c0.01	0.02	
v/s Ratio Perm			0.04			0.01						0.00
v/c Ratio	0.38	0.23	0.07	0.51	0.44	0.02	0.24	0.20		0.28	0.17	0.02
Uniform Delay, d1	58.5	8.6	7.6	58.6	10.0	7.2	59.0	50.9		59.6	51.1	50.2
Progression Factor	0.99	0.91	1.55	0.83	1.60	2.75	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.1	0.2	0.1	1.2	0.5	0.0	0.7	0.4		0.3	0.1	0.0
Delay (s)	58.7	8.0	11.9	49.9	16.6	19.8	59.7	51.3		59.9	51.3	50.2
Level of Service	E	A	B	D	B	B	E	D		E	D	D
Approach Delay (s)		12.8			18.5			52.5			54.6	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	22.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	58.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1562	1770	3539	1583	3433	1863	1562	3433	3139	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1562	1770	3539	1583	3433	1863	1562	3433	3139	
Volume (vph)	292	580	26	81	673	80	89	48	41	105	77	238
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	324	644	29	90	748	89	99	53	46	117	86	264
RTOR Reduction (vph)	0	0	10	0	0	51	0	0	43	0	236	0
Lane Group Flow (vph)	324	644	19	90	748	38	99	53	3	117	114	0
Confl. Peds. (#/hr)			1	1					1	1		
Turn Type	Prot		Perm	Prot		Perm	Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	38.4	82.4	82.4	10.8	54.8	54.8	8.0	8.0	8.0	12.8	12.8	
Effective Green, g (s)	39.4	83.4	83.4	11.8	55.8	55.8	9.0	9.0	9.0	13.8	13.8	
Actuated g/C Ratio	0.30	0.64	0.64	0.09	0.43	0.43	0.07	0.07	0.07	0.11	0.11	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	536	3262	1002	161	1519	679	238	129	108	364	333	
v/s Ratio Prot	c0.18	0.13		0.05	c0.21		c0.03	0.03		0.03	c0.04	
v/s Ratio Perm			0.01			0.02			0.00			
v/c Ratio	0.60	0.20	0.02	0.56	0.49	0.06	0.42	0.41	0.03	0.32	0.34	
Uniform Delay, d1	38.7	9.6	8.5	56.6	26.9	21.7	58.0	58.0	56.4	53.8	53.9	
Progression Factor	0.77	0.46	0.14	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	0.1	0.0	2.4	1.1	0.2	0.4	0.8	0.0	0.2	0.2	
Delay (s)	31.2	4.6	1.2	59.0	28.0	21.9	58.4	58.7	56.5	54.0	54.1	
Level of Service	C	A	A	E	C	C	E	E	E	D	D	
Approach Delay (s)		13.1			30.4			58.0			54.1	
Approach LOS		B			C			E			D	

Intersection Summary			
HCM Average Control Delay	30.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.83	1.00	1.00	0.92	1.00	0.95		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1308	1770	3539	1454	3433	3150		2000	3508	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1308	1770	3539	1454	3433	3150		1770	3508	
Volume (vph)	35	709	164	228	981	185	298	245	174	353	457	17
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	39	797	184	256	1102	208	335	275	196	397	513	19
RTOR Reduction (vph)	0	0	47	0	0	34	0	102	0	0	2	0
Lane Group Flow (vph)	39	797	137	256	1102	174	335	369	0	397	530	0
Confl. Peds. (#/hr)	44		101	101		44	58		69	69		58
Confl. Bikes (#/hr)			31			15			13			5
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	7.3	33.7	33.7	23.2	49.6	49.6	17.5	24.3		30.3	37.1	
Effective Green, g (s)	8.8	35.7	35.7	24.7	51.6	51.6	19.0	25.8		31.8	38.6	
Actuated g/C Ratio	0.07	0.27	0.27	0.19	0.40	0.40	0.15	0.20		0.24	0.30	
Clearance Time (s)	4.5	5.0	5.0	4.5	5.0	5.0	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	7.0	7.0	3.0	7.0	7.0	3.0	3.0		4.0	3.0	
Lane Grp Cap (vph)	120	972	359	336	1405	577	502	625		489	1042	
v/s Ratio Prot	0.02	0.23		c0.14	c0.31		0.10	c0.12		c0.20	0.15	
v/s Ratio Perm			0.10			0.12						
v/c Ratio	0.33	0.82	0.38	0.76	0.78	0.30	0.67	0.59		0.81	0.51	
Uniform Delay, d1	57.8	44.1	38.2	49.9	34.3	26.9	52.5	47.3		46.3	37.8	
Progression Factor	1.18	1.23	1.56	1.08	0.55	0.33	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	7.2	2.8	6.0	2.7	0.8	3.3	1.5		10.4	0.4	
Delay (s)	69.7	61.6	62.6	59.7	21.4	9.7	55.9	48.8		56.7	38.2	
Level of Service	E	E	E	E	C	A	E	D		E	D	
Approach Delay (s)		62.1			26.1			51.7			46.1	
Approach LOS		E			C			D			D	

Intersection Summary			
HCM Average Control Delay	43.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		0.91	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.96	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00
Satd. Flow (prot)	1770	3539	1515	1770	3539	1519	1770	3421		1900	3275	1554
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00
Satd. Flow (perm)	1770	3539	1515	1770	3539	1519	1770	3421		1610	3275	1554
Volume (vph)	218	581	18	24	1012	213	36	53	13	405	85	329
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	242	646	20	27	1124	237	40	59	14	450	94	366
RTOR Reduction (vph)	0	0	9	0	0	106	0	13	0	0	0	296
Lane Group Flow (vph)	242	646	11	27	1124	131	40	60	0	225	319	70
Confl. Peds. (#/hr)	18		20	20		18	5		10	10		5
Confl. Bikes (#/hr)			12			9						
Turn Type	Prot		Perm	Prot		Perm	Split			Split		Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	26.6	71.6	71.6	4.2	48.7	48.7	11.8	11.8		22.9	22.9	22.9
Effective Green, g (s)	28.6	73.6	73.6	5.7	50.7	50.7	13.8	13.8		24.9	24.9	24.9
Actuated g/C Ratio	0.22	0.57	0.57	0.04	0.39	0.39	0.11	0.11		0.19	0.19	0.19
Clearance Time (s)	5.0	5.0	5.0	4.5	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	5.0	5.0	5.0	3.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lane Grp Cap (vph)	389	2004	858	78	1380	592	188	363		364	627	298
v/s Ratio Prot	c0.14	0.18		0.02	c0.32		c0.02	0.02		c0.12	0.10	
v/s Ratio Perm			0.01			0.09						0.05
v/c Ratio	0.62	0.32	0.01	0.35	0.81	0.22	0.21	0.17		0.62	0.51	0.24
Uniform Delay, d1	45.8	15.0	12.3	60.3	35.4	26.5	53.1	52.9		48.2	47.1	44.5
Progression Factor	1.46	1.13	2.18	1.23	0.71	0.52	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.9	0.4	0.0	2.4	4.8	0.8	1.2	0.5		4.5	1.4	0.9
Delay (s)	70.9	17.4	26.9	76.4	30.0	14.6	54.3	53.3		52.7	48.4	45.3
Level of Service	E	B	C	E	C	B	D	D		D	D	D
Approach Delay (s)		31.8			28.2			53.7			48.2	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	35.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.87		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5057		1770	5062		1770	1612		1770	1661	
Flt Permitted	0.95	1.00		0.95	1.00		0.64	1.00		0.37	1.00	
Satd. Flow (perm)	1770	5057		1770	5062		1188	1612		696	1661	
Volume (vph)	20	904	30	59	1179	37	39	14	123	24	16	41
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	22	972	32	63	1268	40	42	15	132	26	17	44
RTOR Reduction (vph)	0	1	0	0	1	0	0	121	0	0	40	0
Lane Group Flow (vph)	22	1003	0	63	1307	0	42	26	0	26	21	0
Confl. Peds. (#/hr)			1	1								
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	5.4	96.8		9.5	100.9		9.2	9.2		9.2	9.2	
Effective Green, g (s)	6.9	99.3		11.0	103.4		10.7	10.7		10.7	10.7	
Actuated g/C Ratio	0.05	0.76		0.08	0.80		0.08	0.08		0.08	0.08	
Clearance Time (s)	4.5	5.5		4.5	5.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	4.0	6.0		4.0	6.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	94	3863		150	4026		98	133		57	137	
v/s Ratio Prot	0.01	0.20		c0.04	c0.26			0.02			0.01	
v/s Ratio Perm							0.04			c0.04		
v/c Ratio	0.23	0.26		0.42	0.32		0.43	0.19		0.46	0.15	
Uniform Delay, d1	59.0	4.5		56.5	3.7		56.7	55.6		56.9	55.4	
Progression Factor	0.93	1.05		0.98	0.70		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	0.1		2.2	0.2		3.0	0.7		5.7	0.5	
Delay (s)	56.7	4.9		57.7	2.7		59.7	56.3		62.6	55.9	
Level of Service	E	A		E	A		E	E		E	E	
Approach Delay (s)		6.0			5.3			57.1			57.9	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM Average Control Delay	10.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.90		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1665		1770	1667		1770	3483		1770	3495	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1665		1770	1667		1770	3483		1770	3495	
Volume (vph)	44	77	143	84	93	162	70	384	31	78	623	26
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	49	86	159	93	103	180	78	427	34	87	692	29
RTOR Reduction (vph)	0	39	0	0	35	0	0	3	0	0	2	0
Lane Group Flow (vph)	49	206	0	93	248	0	78	458	0	87	719	0
Confl. Peds. (#/hr)	3		2	2		3	45		16	16		45
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	21.5	21.5		24.9	24.9		9.7	65.9		10.3	66.5	
Effective Green, g (s)	22.0	22.0		25.4	25.4		10.2	67.4		10.8	68.0	
Actuated g/C Ratio	0.16	0.16		0.18	0.18		0.07	0.49		0.08	0.49	
Clearance Time (s)	3.5	3.5		3.5	3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	283	266		327	308		131	1706		139	1727	
v/s Ratio Prot	0.03	c0.12		0.05	c0.15		c0.04	0.13		c0.05	c0.21	
v/s Ratio Perm												
v/c Ratio	0.17	0.77		0.28	0.80		0.60	0.27		0.63	0.42	
Uniform Delay, d1	49.9	55.4		48.3	53.7		61.7	20.6		61.4	22.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	13.0		0.5	14.1		7.1	0.4		8.5	0.7	
Delay (s)	50.2	68.4		48.8	67.9		68.8	21.0		69.9	22.9	
Level of Service	D	E		D	E		E	C		E	C	
Approach Delay (s)		65.4			63.1			27.9			28.0	
Approach LOS		E			E			C			C	

Intersection Summary			
HCM Average Control Delay	40.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	137.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1661		1767	1863	1583	1770	3539	1545	1770	3474	
Flt Permitted	0.69	1.00		0.46	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1280	1661		855	1863	1583	1770	3539	1545	1770	3474	
Volume (vph)	150	50	100	48	67	155	67	504	25	74	576	80
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	169	56	112	54	75	174	75	566	28	83	647	90
RTOR Reduction (vph)	0	91	0	0	0	142	0	0	0	0	6	0
Lane Group Flow (vph)	169	77	0	54	75	32	75	566	28	83	731	0
Confl. Peds. (#/hr)			2	2					9	9		
Turn Type	Perm			Perm		Perm	Prot		Free	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8			Free			
Actuated Green, G (s)	16.9	16.9		16.9	16.9	16.9	8.3	59.8	100.0	8.8	60.3	
Effective Green, g (s)	18.4	18.4		18.4	18.4	18.4	9.3	62.8	100.0	9.8	63.3	
Actuated g/C Ratio	0.18	0.18		0.18	0.18	0.18	0.09	0.63	1.00	0.10	0.63	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.5	3.5	3.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	236	306		157	343	291	165	2222	1545	173	2199	
v/s Ratio Prot		0.05			0.04		0.04	0.16		c0.05	c0.21	
v/s Ratio Perm	c0.13			0.06		0.02			c0.02			
v/c Ratio	0.72	0.25		0.34	0.22	0.11	0.45	0.25	0.02	0.48	0.33	
Uniform Delay, d1	38.3	34.9		35.5	34.7	34.0	42.9	8.2	0.0	42.7	8.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.14	0.44	
Incremental Delay, d2	9.9	0.4		1.6	0.4	0.2	2.0	0.3	0.0	2.0	0.4	
Delay (s)	48.2	35.3		37.1	35.1	34.2	44.9	8.5	0.0	50.6	4.1	
Level of Service	D	D		D	D	C	D	A	A	D	A	
Approach Delay (s)		41.8			34.9			12.2			8.8	
Approach LOS		D			C			B			A	

Intersection Summary			
HCM Average Control Delay	18.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	0.97	0.95	0.95	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1562	3433	5085	1547	3433	1595	1504	1770	1863	1558
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1562	3433	5085	1547	3433	1595	1504	1770	1863	1558
Volume (vph)	122	1586	100	480	1256	474	110	55	262	305	56	62
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	127	1652	104	500	1308	494	115	57	273	318	58	65
RTOR Reduction (vph)	0	0	22	0	0	207	0	66	142	0	0	56
Lane Group Flow (vph)	127	1652	82	500	1308	287	115	101	21	318	58	9
Confl. Peds. (#/hr)	1		1	1		1	4					4
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	10.0	58.7	58.7	23.9	72.6	72.6	11.9	15.4	15.4	14.0	17.5	17.5
Effective Green, g (s)	11.0	61.7	61.7	24.9	75.6	75.6	12.9	16.4	16.4	15.0	18.5	18.5
Actuated g/C Ratio	0.08	0.47	0.47	0.19	0.58	0.58	0.10	0.13	0.13	0.12	0.14	0.14
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	6.0	6.0	2.0	2.0	2.0	2.0	6.0	6.0
Lane Grp Cap (vph)	150	2413	741	658	2957	900	341	201	190	204	265	222
v/s Ratio Prot	c0.07	c0.32		c0.15	0.26		0.03	c0.06		c0.18	0.03	
v/s Ratio Perm			0.05			0.19			0.01			0.01
v/c Ratio	0.85	0.68	0.11	0.76	0.44	0.32	0.34	0.50	0.11	1.56	0.22	0.04
Uniform Delay, d1	58.7	26.6	18.9	49.7	15.3	14.0	54.6	53.0	50.3	57.5	49.4	48.1
Progression Factor	0.87	0.76	0.91	1.24	0.73	1.48	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	25.3	1.2	0.2	3.1	0.3	0.6	0.2	0.7	0.1	274.1	1.2	0.2
Delay (s)	76.3	21.4	17.5	64.7	11.6	21.4	54.8	53.7	50.4	331.6	50.5	48.3
Level of Service	E	C	B	E	B	C	D	D	D	F	D	D
Approach Delay (s)		24.9			25.2			52.8			252.8	
Approach LOS		C			C			D			F	

Intersection Summary			
HCM Average Control Delay	47.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	82.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Util. Factor		0.91	1.00	0.97	0.91					0.95	0.95	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5085	1583	3433	5085					1681	1689	1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5085	1583	3433	5085					1681	1689	1583
Volume (vph)	0	1519	642	98	1576	0	0	0	0	416	10	624
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1599	676	103	1659	0	0	0	0	438	11	657
RTOR Reduction (vph)	0	0	389	0	0	0	0	0	0	0	0	7
Lane Group Flow (vph)	0	1599	287	103	1659	0	0	0	0	219	230	650
Confl. Peds. (#/hr)							3		3			
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		2		1	6						4	
Permitted Phases			2							4		4
Actuated Green, G (s)		52.7	52.7	8.9	65.6					54.9	54.9	54.9
Effective Green, g (s)		55.2	55.2	9.9	68.1					55.9	55.9	55.9
Actuated g/C Ratio		0.42	0.42	0.08	0.52					0.43	0.43	0.43
Clearance Time (s)		5.5	5.5	4.0	5.5					4.0	4.0	4.0
Vehicle Extension (s)		4.0	4.0	3.0	4.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2159	672	261	2664					723	726	681
v/s Ratio Prot		c0.31		0.03	c0.33							
v/s Ratio Perm			0.18							0.13	0.14	c0.41
v/c Ratio		0.74	0.43	0.39	0.62					0.30	0.32	0.95
Uniform Delay, d1		31.4	26.3	57.2	21.9					24.3	24.4	35.8
Progression Factor		0.72	1.85	1.05	0.59					1.00	1.00	1.00
Incremental Delay, d2		1.5	1.3	0.9	1.0					0.2	0.3	23.7
Delay (s)		24.0	49.9	61.0	14.0					24.5	24.7	59.5
Level of Service		C	D	E	B					C	C	E
Approach Delay (s)		31.7			16.8			0.0			45.4	
Approach LOS		C			B			A			D	

Intersection Summary			
HCM Average Control Delay	29.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			
Lane Util. Factor		0.91	1.00	1.00	0.91	1.00	0.95	0.95	1.00			
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00			
Satd. Flow (prot)		5085	1583	1770	5085	1583	1681	1696	1583			
Flt Permitted		1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00			
Satd. Flow (perm)		5085	1583	1770	5085	1583	1681	1696	1583			
Volume (vph)	0	1590	428	21	1099	357	592	43	137	0	0	0
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	1747	470	23	1208	392	651	47	151	0	0	0
RTOR Reduction (vph)	0	0	148	0	0	115	0	0	114	0	0	0
Lane Group Flow (vph)	0	1747	322	23	1208	277	340	358	37	0	0	0
Turn Type			Perm	Prot		Perm	Split		Perm			
Protected Phases		2		1	6		8	8				
Permitted Phases			2			6			8			
Actuated Green, G (s)		80.7	80.7	4.2	88.9	88.9	31.1	31.1	31.1			
Effective Green, g (s)		83.7	83.7	5.2	91.9	91.9	32.1	32.1	32.1			
Actuated g/C Ratio		0.64	0.64	0.04	0.71	0.71	0.25	0.25	0.25			
Clearance Time (s)		6.0	6.0	4.0	6.0	6.0	4.0	4.0	4.0			
Vehicle Extension (s)		4.0	4.0	2.0	4.0	4.0	2.0	2.0	2.0			
Lane Grp Cap (vph)		3274	1019	71	3595	1119	415	419	391			
v/s Ratio Prot		c0.34		0.01	c0.24		0.20	c0.21				
v/s Ratio Perm			0.20			0.18			0.02			
v/c Ratio		0.53	0.32	0.32	0.34	0.25	0.82	0.85	0.10			
Uniform Delay, d1		12.6	10.4	60.7	7.3	6.8	46.2	46.7	37.8			
Progression Factor		0.24	0.03	0.86	1.05	1.90	1.00	1.00	1.00			
Incremental Delay, d2		0.5	0.7	0.9	0.2	0.5	11.4	15.0	0.0			
Delay (s)		3.5	1.0	52.8	7.9	13.4	57.6	61.7	37.8			
Level of Service		A	A	D	A	B	E	E	D			
Approach Delay (s)		3.0			9.9			55.8			0.0	
Approach LOS		A			A			E			A	

Intersection Summary			
HCM Average Control Delay	14.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1549	1770	3539	1561	3433	3174		3433	1863	1561
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1549	1770	3539	1561	3433	3174		3433	1863	1561
Volume (vph)	217	1078	256	160	1071	55	51	76	167	114	67	101
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	231	1147	272	170	1139	59	54	81	178	121	71	107
RTOR Reduction (vph)	0	0	118	0	0	20	0	155	0	0	0	90
Lane Group Flow (vph)	231	1147	154	170	1139	39	54	104	0	121	71	17
Confl. Peds. (#/hr)	2		1	1		2	2					2
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	13.2	70.5	70.5	16.1	73.4	73.4	6.3	15.6		9.8	19.1	19.1
Effective Green, g (s)	14.2	73.5	73.5	17.1	76.4	76.4	7.3	16.6		10.8	20.1	20.1
Actuated g/C Ratio	0.11	0.57	0.57	0.13	0.59	0.59	0.06	0.13		0.08	0.15	0.15
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0	3.0	3.0	4.0		2.0	2.0	2.0
Lane Grp Cap (vph)	375	2875	876	233	2080	917	193	405		285	288	241
v/s Ratio Prot	0.07	0.23		c0.10	c0.32		c0.02	c0.03		c0.04	0.04	
v/s Ratio Perm			0.10			0.03						0.01
v/c Ratio	0.62	0.40	0.18	0.73	0.55	0.04	0.28	0.26		0.42	0.25	0.07
Uniform Delay, d1	55.3	15.9	13.6	54.2	16.3	11.3	58.8	51.1		56.6	48.3	47.0
Progression Factor	1.15	0.78	1.25	0.95	1.12	1.88	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.0	0.4	0.4	8.5	0.9	0.1	0.8	0.5		0.4	0.2	0.0
Delay (s)	66.6	12.7	17.5	59.9	19.3	21.4	59.6	51.6		57.0	48.5	47.0
Level of Service	E	B	B	E	B	C	E	D		E	D	D
Approach Delay (s)		21.1			24.4			53.0			51.4	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	27.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.97	1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1562	1770	3539	1540	3433	1863	1562	3433	3106	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1562	1770	3539	1540	3433	1863	1562	3433	3106	
Volume (vph)	346	829	112	53	806	129	76	46	36	231	115	340
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	353	846	114	54	822	132	78	47	37	236	117	347
RTOR Reduction (vph)	0	0	43	0	0	79	0	0	34	0	302	0
Lane Group Flow (vph)	353	846	71	54	822	53	78	47	3	236	162	0
Confl. Peds. (#/hr)	3		1	1		3	3		1	1		3
Turn Type	Prot		Perm	Prot		Perm	Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	35.6	80.2	80.2	7.0	51.6	51.6	10.9	10.9	10.9	15.9	15.9	
Effective Green, g (s)	36.6	81.2	81.2	8.0	52.6	52.6	11.9	11.9	11.9	16.9	16.9	
Actuated g/C Ratio	0.28	0.62	0.62	0.06	0.40	0.40	0.09	0.09	0.09	0.13	0.13	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	498	3176	976	109	1432	623	314	171	143	446	404	
v/s Ratio Prot	c0.20	0.17		0.03	c0.23		0.02	c0.03		c0.07	0.05	
v/s Ratio Perm			0.05			0.03			0.00			
v/c Ratio	0.71	0.27	0.07	0.50	0.57	0.09	0.25	0.27	0.02	0.53	0.40	
Uniform Delay, d1	41.9	11.0	9.6	59.0	30.0	23.9	54.9	55.0	53.8	52.8	51.9	
Progression Factor	1.65	0.62	0.44	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.6	0.2	0.1	1.3	1.7	0.3	0.2	0.3	0.0	0.5	0.2	
Delay (s)	72.8	7.0	4.4	60.3	31.7	24.1	55.0	55.3	53.8	53.4	52.1	
Level of Service	E	A	A	E	C	C	E	E	D	D	D	
Approach Delay (s)		24.5			32.2			54.8			52.6	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	34.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.91	1.00	1.00	0.97	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1435	1770	3539	1531	3433	3297		2000	3498	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1435	1770	3539	1531	3433	3297		1770	3498	
Volume (vph)	87	971	169	238	628	154	205	365	241	168	191	14
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	90	1001	174	245	647	159	211	376	248	173	197	14
RTOR Reduction (vph)	0	0	32	0	0	43	0	87	0	0	5	0
Lane Group Flow (vph)	90	1001	142	245	647	116	211	537	0	173	206	0
Confl. Peds. (#/hr)	12		54	54		12	11		8	8		11
Confl. Bikes (#/hr)			11			9						
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	11.8	48.0	48.0	21.3	57.5	57.5	12.9	25.1		17.1	29.3	
Effective Green, g (s)	13.3	50.0	50.0	22.8	59.5	59.5	14.4	26.6		18.6	30.8	
Actuated g/C Ratio	0.10	0.38	0.38	0.18	0.46	0.46	0.11	0.20		0.14	0.24	
Clearance Time (s)	4.5	5.0	5.0	4.5	5.0	5.0	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	7.0	7.0	3.0	7.0	7.0	3.0	3.0		4.0	3.0	
Lane Grp Cap (vph)	181	1361	552	310	1620	701	380	675		286	829	
v/s Ratio Prot	0.05	c0.28		c0.14	0.18		0.06	c0.16		c0.09	0.06	
v/s Ratio Perm			0.10			0.08						
v/c Ratio	0.50	0.74	0.26	0.79	0.40	0.16	0.56	0.79		0.60	0.25	
Uniform Delay, d1	55.2	34.3	27.3	51.3	23.4	20.7	54.8	49.1		52.3	40.2	
Progression Factor	1.42	0.59	0.60	1.06	1.68	2.45	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	3.1	1.0	11.0	0.6	0.4	1.8	6.4		4.1	0.2	
Delay (s)	80.1	23.4	17.5	65.3	40.0	51.1	56.5	55.5		56.4	40.4	
Level of Service	F	C	B	E	D	D	E	E		E	D	
Approach Delay (s)		26.6			47.6			55.8			47.6	
Approach LOS		C			D			E			D	

Intersection Summary			
HCM Average Control Delay	42.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.95		0.91	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.96	1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (prot)	1770	3539	1521	1770	5085	1519	1770	3388		2000	3263	1534
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (perm)	1770	3539	1521	1770	5085	1519	1770	3388		1610	3263	1534
Volume (vph)	232	1097	22	43	908	369	17	87	26	551	77	153
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	264	1247	25	49	1032	419	19	99	30	626	88	174
RTOR Reduction (vph)	0	0	8	0	0	272	0	25	0	0	0	137
Lane Group Flow (vph)	264	1247	17	49	1032	147	19	104	0	313	401	37
Confl. Peds. (#/hr)	18		20	20		18	14		16	16		14
Confl. Bikes (#/hr)			3			8			1			1
Turn Type	Prot		Perm	Prot		Perm	Split			Split		Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	23.2	62.0	62.0	5.2	43.5	43.5	17.4	17.4		25.9	25.9	25.9
Effective Green, g (s)	25.2	64.0	64.0	6.7	45.5	45.5	19.4	19.4		27.9	27.9	27.9
Actuated g/C Ratio	0.19	0.49	0.49	0.05	0.35	0.35	0.15	0.15		0.21	0.21	0.21
Clearance Time (s)	5.0	5.0	5.0	4.5	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	5.0	5.0	5.0	3.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lane Grp Cap (vph)	343	1742	749	91	1780	532	264	506		429	700	329
v/s Ratio Prot	c0.15	c0.35		0.03	0.20		0.01	c0.03		c0.16	0.12	
v/s Ratio Perm			0.01			0.10						0.02
v/c Ratio	0.77	0.72	0.02	0.54	0.58	0.28	0.07	0.21		0.73	0.87dl	0.11
Uniform Delay, d1	49.7	25.9	16.9	60.1	34.5	30.4	47.6	48.5		47.5	45.7	41.1
Progression Factor	0.81	0.74	0.33	1.13	0.89	1.17	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	10.8	2.3	0.1	5.2	1.2	1.1	0.2	0.4		7.5	1.8	0.3
Delay (s)	50.9	21.4	5.6	73.3	31.9	36.6	47.8	49.0		55.0	47.5	41.4
Level of Service	D	C	A	E	C	D	D	D		E	D	D
Approach Delay (s)		26.2			34.6			48.8			49.0	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	35.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.86		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5061		1770	5068		1767	1605		1770	1652	
Flt Permitted	0.95	1.00		0.95	1.00		0.74	1.00		0.40	1.00	
Satd. Flow (perm)	1770	5061		1770	5068		1372	1605		742	1652	
Volume (vph)	18	1610	44	121	1262	24	35	10	114	42	9	20
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	19	1660	45	125	1301	25	36	10	118	43	9	21
RTOR Reduction (vph)	0	1	0	0	1	0	0	105	0	0	19	0
Lane Group Flow (vph)	19	1704	0	125	1325	0	36	23	0	43	11	0
Confl. Peds. (#/hr)	4		4	4		4	1					1
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	3.7	87.3		15.4	99.0		12.8	12.8		12.8	12.8	
Effective Green, g (s)	5.2	89.8		16.9	101.5		14.3	14.3		14.3	14.3	
Actuated g/C Ratio	0.04	0.69		0.13	0.78		0.11	0.11		0.11	0.11	
Clearance Time (s)	4.5	5.5		4.5	5.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	4.0	6.0		4.0	6.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	71	3496		230	3957		151	177		82	182	
v/s Ratio Prot	0.01	c0.34		c0.07	0.26			0.01			0.01	
v/s Ratio Perm							0.03			c0.06		
v/c Ratio	0.27	0.49		0.54	0.33		0.24	0.13		0.52	0.06	
Uniform Delay, d1	60.6	9.4		52.9	4.2		52.9	52.2		54.6	51.8	
Progression Factor	0.90	0.80		0.87	1.58		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.1	0.4		2.4	0.2		0.8	0.3		5.9	0.1	
Delay (s)	56.6	7.9		48.7	6.9		53.7	52.6		60.6	52.0	
Level of Service	E	A		D	A		D	D		E	D	
Approach Delay (s)		8.4			10.5			52.8			57.0	
Approach LOS		A			B			D			E	

Intersection Summary			
HCM Average Control Delay	12.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.98		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	0.91		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1690		1770	1668		1770	3482		1770	3457	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1690		1770	1668		1770	3482		1770	3457	
Volume (vph)	42	51	82	34	50	75	73	514	49	140	543	63
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	46	55	89	37	54	82	79	559	53	152	590	68
RTOR Reduction (vph)	0	37	0	0	33	0	0	3	0	0	3	0
Lane Group Flow (vph)	46	107	0	37	103	0	79	609	0	152	655	0
Confl. Peds. (#/hr)	10					10	20		7	7		20
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	12.7	12.7		12.5	12.5		9.2	65.5		16.4	72.7	
Effective Green, g (s)	13.2	13.2		13.0	13.0		9.7	67.0		16.9	74.2	
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.08	0.55		0.14	0.61	
Clearance Time (s)	3.5	3.5		3.5	3.5		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	191	183		188	178		141	1911		245	2101	
v/s Ratio Prot	0.03	c0.06		0.02	c0.06		c0.04	c0.17		c0.09	0.19	
v/s Ratio Perm												
v/c Ratio	0.24	0.59		0.20	0.58		0.56	0.32		0.62	0.31	
Uniform Delay, d1	49.9	51.9		49.8	51.9		54.1	15.1		49.6	11.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	4.7		0.5	4.5		5.0	0.4		4.8	0.4	
Delay (s)	50.5	56.6		50.3	56.4		59.2	15.5		54.4	12.0	
Level of Service	D	E		D	E		E	B		D	B	
Approach Delay (s)		55.1			55.1			20.5			19.9	
Approach LOS		E			E			C			B	

Intersection Summary			
HCM Average Control Delay	27.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	122.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	55.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1634		1768	1863	1583	1770	3539	1550	1770	3497	
Flt Permitted	0.75	1.00		0.74	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1400	1634		1374	1863	1583	1770	3539	1550	1770	3497	
Volume (vph)	17	7	22	35	9	133	27	565	39	162	677	50
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	17	7	22	36	9	136	28	577	40	165	691	51
RTOR Reduction (vph)	0	20	0	0	0	123	0	0	0	0	2	0
Lane Group Flow (vph)	17	9	0	36	9	13	28	577	40	165	740	0
Confl. Peds. (#/hr)			1	1			2		2	2		2
Turn Type	Perm			Perm		Perm	Prot		Free	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8			Free			
Actuated Green, G (s)	8.4	8.4		8.4	8.4	8.4	3.4	62.6	100.0	14.5	73.7	
Effective Green, g (s)	9.9	9.9		9.9	9.9	9.9	4.4	65.6	100.0	15.5	76.7	
Actuated g/C Ratio	0.10	0.10		0.10	0.10	0.10	0.04	0.66	1.00	0.16	0.77	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.5	3.5	3.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	139	162		136	184	157	78	2322	1550	274	2682	
v/s Ratio Prot		0.01			0.00		0.02	0.16		c0.09	c0.21	
v/s Ratio Perm	0.01			c0.03		0.01			0.03			
v/c Ratio	0.12	0.06		0.26	0.05	0.09	0.36	0.25	0.03	0.60	0.28	
Uniform Delay, d1	41.1	40.8		41.7	40.8	40.9	46.4	7.1	0.0	39.4	3.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.22	0.16	
Incremental Delay, d2	0.4	0.1		1.2	0.1	0.3	2.8	0.3	0.0	3.4	0.2	
Delay (s)	41.5	41.0		42.9	40.9	41.2	49.2	7.3	0.0	51.6	0.8	
Level of Service	D	D		D	D	D	D	A	A	D	A	
Approach Delay (s)		41.2			41.5			8.7			10.0	
Approach LOS		D			D			A			B	

Intersection Summary			
HCM Average Control Delay	13.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Cumulative No Project

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3489		1770	3539	1770	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3489		1770	3539	1770	1583
Volume (vph)	953	100	238	649	120	229
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	953	100	238	649	120	229
RTOR Reduction (vph)	8	0	0	0	0	178
Lane Group Flow (vph)	1045	0	238	649	120	51
Turn Type			Prot			Perm
Protected Phases	4		3	8	2	
Permitted Phases						2
Actuated Green, G (s)	39.8		18.2	62.0	20.0	20.0
Effective Green, g (s)	39.8		18.2	62.0	20.0	20.0
Actuated g/C Ratio	0.44		0.20	0.69	0.22	0.22
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1543		358	2438	393	352
v/s Ratio Prot	c0.30		c0.13	0.18	c0.07	
v/s Ratio Perm						0.03
v/c Ratio	0.68		0.66	0.27	0.31	0.14
Uniform Delay, d1	20.0		33.1	5.3	29.2	28.1
Progression Factor	1.00		0.93	0.53	1.00	1.00
Incremental Delay, d2	2.4		4.4	0.3	2.0	0.9
Delay (s)	22.4		35.1	3.1	31.2	29.0
Level of Service	C		D	A	C	C
Approach Delay (s)	22.4			11.7	29.8	
Approach LOS	C			B	C	

Intersection Summary			
HCM Average Control Delay	19.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.99		1.00	0.86		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3336		1770	3515		1770	1607		1770	1676	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3336		1770	3515		1770	1607		1770	1676	
Volume (vph)	40	679	420	62	633	30	160	20	217	80	30	60
Peak-hour factor, PHF	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. Flow (vph)	40	679	420	62	633	30	160	20	217	80	30	60
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	52	0
Lane Group Flow (vph)	40	1099	0	62	660	0	160	237	0	80	38	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	4.4	44.3		7.2	47.1		11.0	17.7		4.8	11.5	
Effective Green, g (s)	4.4	44.3		7.2	47.1		11.0	17.7		4.8	11.5	
Actuated g/C Ratio	0.05	0.49		0.08	0.52		0.12	0.20		0.05	0.13	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	87	1642		142	1840		216	316		94	214	
v/s Ratio Prot	0.02	c0.33		0.04	c0.19		c0.09	c0.15		0.05	0.02	
v/s Ratio Perm												
v/c Ratio	0.46	0.67		0.44	0.36		0.74	0.75		0.85	0.18	
Uniform Delay, d1	41.6	17.3		39.5	12.6		38.1	34.1		42.2	35.0	
Progression Factor	0.87	1.84		0.90	0.92		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.1	1.8		2.1	0.5		12.8	9.6		48.3	0.4	
Delay (s)	39.3	33.5		37.7	12.1		50.9	43.7		90.6	35.4	
Level of Service	D	C		D	B		D	D		F	D	
Approach Delay (s)		33.7			14.3			46.6			61.4	
Approach LOS		C			B			D			E	

Intersection Summary			
HCM Average Control Delay	31.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0					4.0	4.0	4.0
Lane Util. Factor		0.95			0.95					0.95	0.95	1.00
Frt		0.99			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	0.95	1.00
Satd. Flow (prot)		3514			3539					1681	1681	1583
Flt Permitted		1.00			1.00					0.95	0.95	1.00
Satd. Flow (perm)		3514			3539					1681	1681	1583
Volume (vph)	0	929	46	0	420	0	0	0	0	840	0	305
Peak-hour factor, PHF	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. Flow (vph)	0	929	46	0	420	0	0	0	0	840	0	305
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	975	0	0	420	0	0	0	0	420	420	305
Turn Type										Perm		custom
Protected Phases		2			6						4	4
Permitted Phases										4		4
Actuated Green, G (s)		53.4			53.4					28.6	28.6	28.6
Effective Green, g (s)		53.4			53.4					28.6	28.6	28.6
Actuated g/C Ratio		0.59			0.59					0.32	0.32	0.32
Clearance Time (s)		4.0			4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2085			2100					534	534	503
v/s Ratio Prot		c0.28			0.12							0.19
v/s Ratio Perm										c0.25	0.25	
v/c Ratio		0.47			0.20					0.79	0.79	0.61
Uniform Delay, d1		10.3			8.4					27.9	27.9	25.9
Progression Factor		0.43			0.09					1.00	1.00	1.00
Incremental Delay, d2		0.6			0.2					7.5	7.5	2.1
Delay (s)		5.0			1.0					35.4	35.4	28.0
Level of Service		A			A					D	D	C
Approach Delay (s)		5.0			1.0			0.0			33.5	
Approach LOS		A			A			A			C	

Intersection Summary			
HCM Average Control Delay	17.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	0.95			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	1770	3539			3539	1583		1770	1583			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	1770	3539			3539	1583		1770	1583			
Volume (vph)	155	1615	0	0	565	620	5	0	100	0	0	0
Peak-hour factor, PHF	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. Flow (vph)	155	1615	0	0	565	620	5	0	100	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	155	1615	0	0	565	620	0	5	100	0	0	0
Turn Type	Prot					Perm	Perm		custom			
Protected Phases	5	2			6			8	8			
Permitted Phases						6	8		8			
Actuated Green, G (s)	18.0	71.2			49.2	49.2		10.8	10.8			
Effective Green, g (s)	18.0	71.2			49.2	49.2		10.8	10.8			
Actuated g/C Ratio	0.20	0.79			0.55	0.55		0.12	0.12			
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)	354	2800			1935	865		212	190			
v/s Ratio Prot	0.09	c0.46			0.16				c0.06			
v/s Ratio Perm						c0.39		0.00				
v/c Ratio	0.44	0.58			0.29	0.72		0.02	0.53			
Uniform Delay, d1	31.6	3.6			11.0	15.2		34.9	37.2			
Progression Factor	1.03	0.92			0.07	0.22		1.00	1.00			
Incremental Delay, d2	0.8	0.8			0.3	4.1		0.0	2.6			
Delay (s)	33.3	4.1			1.1	7.4		35.0	39.8			
Level of Service	C	A			A	A		C	D			
Approach Delay (s)		6.7			4.4			39.6			0.0	
Approach LOS		A			A			D			A	

Intersection Summary			
HCM Average Control Delay	6.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.94		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	1770	4897		3433	3332		1770	3443	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	1770	4897		3433	3332		1770	3443	
Volume (vph)	160	925	630	260	975	320	170	250	160	130	180	40
Peak-hour factor, PHF	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. Flow (vph)	160	925	630	260	975	320	170	250	160	130	180	40
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	160	925	630	260	1295	0	170	410	0	130	220	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	15.0	37.5	37.5	14.7	37.2		11.0	14.8		7.0	10.8	
Effective Green, g (s)	15.0	37.5	37.5	14.7	37.2		11.0	14.8		7.0	10.8	
Actuated g/C Ratio	0.17	0.42	0.42	0.16	0.41		0.12	0.16		0.08	0.12	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	295	2119	660	289	2024		420	548		138	413	
v/s Ratio Prot	0.09	0.18		c0.15	0.26		0.05	c0.12		c0.07	0.06	
v/s Ratio Perm			c0.40									
v/c Ratio	0.54	0.44	0.95	0.90	0.64		0.40	0.75		0.94	0.53	
Uniform Delay, d1	34.4	18.7	25.4	36.9	21.1		36.5	35.8		41.3	37.2	
Progression Factor	0.84	0.74	0.74	0.69	0.58		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	0.5	22.6	25.2	1.3		0.6	5.5		58.8	1.3	
Delay (s)	30.6	14.5	41.6	50.8	13.6		37.1	41.4		100.1	38.6	
Level of Service	C	B	D	D	B		D	D		F	D	
Approach Delay (s)		25.9			19.8			40.1			61.4	
Approach LOS		C			B			D			E	

Intersection Summary			
HCM Average Control Delay	28.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	5085	5034		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	5085	5034		1770	1583
Volume (vph)	290	925	1245	90	60	310
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	290	925	1245	90	60	310
RTOR Reduction (vph)	0	0	9	0	0	218
Lane Group Flow (vph)	290	925	1326	0	60	92
Turn Type	Prot					Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	12.6	55.2	38.6		26.8	26.8
Effective Green, g (s)	12.6	55.2	38.6		26.8	26.8
Actuated g/C Ratio	0.14	0.61	0.43		0.30	0.30
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	481	3119	2159		527	471
v/s Ratio Prot	c0.08	0.18	c0.26		0.03	
v/s Ratio Perm						c0.06
v/c Ratio	0.60	0.30	0.61		0.11	0.20
Uniform Delay, d1	36.4	8.2	19.9		23.0	23.6
Progression Factor	0.90	1.41	0.62		1.00	1.00
Incremental Delay, d2	1.8	0.0	0.4		0.4	0.9
Delay (s)	34.7	11.6	12.7		23.4	24.5
Level of Service	C	B	B		C	C
Approach Delay (s)		17.1	12.7		24.3	
Approach LOS		B	B		C	

Intersection Summary			
HCM Average Control Delay	16.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	1770	3516		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	3539	1583	1770	3516		1770	3539	1583
Volume (vph)	285	650	50	70	850	140	140	220	10	40	310	345
Peak-hour factor, PHF	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. Flow (vph)	285	650	50	70	850	140	140	220	10	40	310	345
RTOR Reduction (vph)	0	0	28	0	0	85	0	4	0	0	0	237
Lane Group Flow (vph)	285	650	22	70	850	55	140	226	0	40	310	108
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	12.0	40.4	40.4	7.1	35.5	35.5	11.2	22.9		3.6	15.3	15.3
Effective Green, g (s)	12.0	40.4	40.4	7.1	35.5	35.5	11.2	22.9		3.6	15.3	15.3
Actuated g/C Ratio	0.13	0.45	0.45	0.08	0.39	0.39	0.12	0.25		0.04	0.17	0.17
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	458	1589	711	140	1396	624	220	895		71	602	269
v/s Ratio Prot	c0.08	0.18		0.04	c0.24		c0.08	0.06		0.02	c0.09	
v/s Ratio Perm			0.01			0.03						0.07
v/c Ratio	0.62	0.41	0.03	0.50	0.61	0.09	0.64	0.25		0.56	0.51	0.40
Uniform Delay, d1	36.9	16.7	13.9	39.7	21.7	17.1	37.5	26.7		42.4	34.0	33.3
Progression Factor	1.19	0.71	1.62	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.6	0.8	0.1	2.8	2.0	0.3	5.9	0.1		9.8	0.7	1.0
Delay (s)	46.6	12.6	22.6	42.5	23.7	17.4	43.4	26.9		52.3	34.7	34.3
Level of Service	D	B	C	D	C	B	D	C		D	C	C
Approach Delay (s)		22.9			24.1			33.1			35.5	
Approach LOS		C			C			C			D	

Intersection Summary			
HCM Average Control Delay	27.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	3433	1534	1504	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	3433	1534	1504	1770	1863	1583
Volume (vph)	42	950	20	260	1460	249	50	10	160	328	10	26
Peak-hour factor, PHF	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. Flow (vph)	42	950	20	260	1460	249	50	10	160	328	10	26
RTOR Reduction (vph)	0	0	11	0	0	117	0	74	74	0	0	21
Lane Group Flow (vph)	42	950	9	260	1460	132	50	16	6	328	10	5
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	2.4	46.9	46.9	14.0	58.5	58.5	10.7	8.9	8.9	24.2	22.4	22.4
Effective Green, g (s)	2.4	46.9	46.9	14.0	58.5	58.5	10.7	8.9	8.9	24.2	22.4	22.4
Actuated g/C Ratio	0.02	0.43	0.43	0.13	0.53	0.53	0.10	0.08	0.08	0.22	0.20	0.20
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	75	2168	675	437	2704	842	334	124	122	389	379	322
v/s Ratio Prot	0.01	c0.19		0.08	c0.29		0.01	c0.01		c0.19	0.01	
v/s Ratio Perm			0.01			0.08			0.00			0.00
v/c Ratio	0.56	0.44	0.01	0.59	0.54	0.16	0.15	0.13	0.05	0.84	0.03	0.02
Uniform Delay, d1	53.3	22.3	18.2	45.3	16.9	13.2	45.5	47.0	46.7	41.1	35.1	35.0
Progression Factor	1.00	1.00	1.00	0.64	0.89	1.10	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.2	0.6	0.0	1.9	0.7	0.3	0.2	0.5	0.2	15.2	0.0	0.0
Delay (s)	62.5	22.9	18.2	30.9	15.7	14.8	45.7	47.5	46.8	56.3	35.1	35.0
Level of Service	E	C	B	C	B	B	D	D	D	E	D	D
Approach Delay (s)		24.5			17.6			46.8			54.2	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM Average Control Delay	25.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.91	1.00	0.97	0.91					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5085	1583	3433	5085					1681	1681	1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5085	1583	3433	5085					1681	1681	1583
Volume (vph)	0	1156	282	160	1769	0	0	0	0	723	0	200
Peak-hour factor, PHF	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. Flow (vph)	0	1156	282	160	1769	0	0	0	0	723	0	200
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1156	282	160	1769	0	0	0	0	362	361	200
Turn Type			Perm	Prot						Split		Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		53.3	53.3	16.0	73.3					28.7	28.7	28.7
Effective Green, g (s)		53.3	53.3	16.0	73.3					28.7	28.7	28.7
Actuated g/C Ratio		0.48	0.48	0.15	0.67					0.26	0.26	0.26
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2464	767	499	3388					439	439	413
v/s Ratio Prot		0.23		0.05	c0.35					c0.22	0.21	
v/s Ratio Perm			0.18									0.13
v/c Ratio		0.47	0.37	0.32	0.52					0.82	0.82	0.48
Uniform Delay, d1		18.9	17.8	42.1	9.4					38.3	38.3	34.4
Progression Factor		1.11	1.06	1.11	0.93					1.00	1.00	1.00
Incremental Delay, d2		0.6	1.2	0.3	0.5					11.9	11.8	0.9
Delay (s)		21.6	20.1	47.0	9.2					50.2	50.0	35.3
Level of Service		C	C	D	A					D	D	D
Approach Delay (s)		21.3			12.4			0.0			46.9	
Approach LOS		C			B			A			D	

Intersection Summary			
HCM Average Control Delay	22.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor		0.91	1.00	0.97	0.91	1.00	0.97	1.00	1.00			
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)		5085	1583	3433	5085	1583	3433	1863	1583			
Flt Permitted		1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)		5085	1583	3433	5085	1583	3433	1863	1583			
Volume (vph)	0	1580	300	70	1655	714	274	10	250	0	0	0
Peak-hour factor, PHF	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. Flow (vph)	0	1580	300	70	1655	714	274	10	250	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1580	300	70	1655	714	274	10	250	0	0	0
Turn Type			Perm	Prot		Perm	Perm		Perm			
Protected Phases		2		1	6			8				
Permitted Phases			2			6	8		8			
Actuated Green, G (s)		70.4	70.4	5.6	80.0	80.0	22.0	22.0	22.0			
Effective Green, g (s)		70.4	70.4	5.6	80.0	80.0	22.0	22.0	22.0			
Actuated g/C Ratio		0.64	0.64	0.05	0.73	0.73	0.20	0.20	0.20			
Clearance Time (s)		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)		3254	1013	175	3698	1151	687	373	317			
v/s Ratio Prot		0.31		0.02	0.33			0.01				
v/s Ratio Perm			0.19			c0.45	0.08		c0.16			
v/c Ratio		0.49	0.30	0.40	0.45	0.62	0.40	0.03	0.79			
Uniform Delay, d1		10.3	8.8	50.6	6.1	7.5	38.3	35.4	41.8			
Progression Factor		0.15	0.17	1.05	0.68	0.98	1.00	1.00	1.00			
Incremental Delay, d2		0.5	0.7	0.9	0.2	1.5	0.4	0.0	12.2			
Delay (s)		2.0	2.2	54.0	4.4	8.8	38.6	35.4	54.0			
Level of Service		A	A	D	A	A	D	D	D			
Approach Delay (s)		2.1			7.1			45.8			0.0	
Approach LOS		A			A			D			A	

Intersection Summary			
HCM Average Control Delay	9.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		0.97	0.95		0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	5063		3433	3509		3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	5063		3433	3509		3433	3539	1583
Volume (vph)	460	1110	240	70	1690	50	500	500	30	10	150	280
Peak-hour factor, PHF	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. Flow (vph)	460	1110	240	70	1690	50	500	500	30	10	150	280
RTOR Reduction (vph)	0	0	79	0	3	0	0	4	0	0	0	167
Lane Group Flow (vph)	460	1110	161	70	1737	0	500	526	0	10	150	113
Turn Type	Prot		pm+ov	Prot			Prot			Prot		Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2									4
Actuated Green, G (s)	16.8	55.0	74.0	4.8	43.0		19.0	33.4		0.8	15.2	15.2
Effective Green, g (s)	16.8	55.0	74.0	4.8	43.0		19.0	33.4		0.8	15.2	15.2
Actuated g/C Ratio	0.15	0.50	0.67	0.04	0.39		0.17	0.30		0.01	0.14	0.14
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	524	2543	1065	77	1979		593	1065		25	489	219
v/s Ratio Prot	c0.13	0.22	0.03	0.04	c0.34		c0.15	c0.15		0.00	0.04	
v/s Ratio Perm			0.08									0.07
v/c Ratio	0.88	0.44	0.15	0.91	0.88		0.84	0.49		0.40	0.31	0.52
Uniform Delay, d1	45.6	17.6	6.6	52.4	31.1		44.1	31.4		54.4	42.7	44.0
Progression Factor	1.26	1.42	4.04	1.21	1.46		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	13.8	0.5	0.1	62.2	4.8		10.6	0.4		10.2	0.4	2.0
Delay (s)	71.2	25.5	26.6	125.8	50.2		54.6	31.7		64.5	43.0	46.0
Level of Service	E	C	C	F	D		D	C		E	D	D
Approach Delay (s)		37.2			53.1			42.8			45.4	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	44.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	1.00	1.00	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	3433	1863	1583	3433	3260	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	3433	1863	1583	3433	3260	
Volume (vph)	220	680	260	30	1200	340	510	200	20	90	90	100
Peak-hour factor, PHF	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. Flow (vph)	220	680	260	30	1200	340	510	200	20	90	90	100
RTOR Reduction (vph)	0	0	121	0	0	159	0	0	16	0	92	0
Lane Group Flow (vph)	220	680	139	30	1200	181	510	200	4	90	98	0
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	22.5	59.0	59.0	4.3	40.8	40.8	22.2	19.4	19.4	11.3	8.5	
Effective Green, g (s)	22.5	59.0	59.0	4.3	40.8	40.8	22.2	19.4	19.4	11.3	8.5	
Actuated g/C Ratio	0.20	0.54	0.54	0.04	0.37	0.37	0.20	0.18	0.18	0.10	0.08	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	362	2727	849	69	1886	587	693	329	279	353	252	
v/s Ratio Prot	c0.12	0.13		0.02	c0.24		c0.15	c0.11		0.03	0.03	
v/s Ratio Perm			0.09			0.11			0.00			
v/c Ratio	0.61	0.25	0.16	0.43	0.64	0.31	0.74	0.61	0.01	0.25	0.39	
Uniform Delay, d1	39.7	13.6	13.0	51.7	28.5	24.6	41.2	41.8	37.4	45.5	48.3	
Progression Factor	1.37	1.52	7.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.7	0.2	0.4	4.3	1.7	1.4	4.1	3.2	0.0	0.4	1.0	
Delay (s)	57.0	21.0	91.1	56.0	30.1	25.9	45.2	45.0	37.4	45.9	49.3	
Level of Service	E	C	F	E	C	C	D	D	D	D	D	
Approach Delay (s)		43.6			29.7			44.9			48.2	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM Average Control Delay	38.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		0.97	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.97		1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	4943		1770	4922		3433	3381		1770	3429	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	4943		1770	4922		3433	3381		1770	3429	
Volume (vph)	110	700	160	200	1320	360	450	520	220	340	380	100
Peak-hour factor, PHF	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. Flow (vph)	110	700	160	200	1320	360	450	520	220	340	380	100
RTOR Reduction (vph)	0	33	0	0	44	0	0	42	0	0	21	0
Lane Group Flow (vph)	110	827	0	200	1636	0	450	698	0	340	459	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	7.0	32.4		15.1	40.5		18.5	24.0		22.5	28.0	
Effective Green, g (s)	7.0	32.4		15.1	40.5		18.5	24.0		22.5	28.0	
Actuated g/C Ratio	0.06	0.29		0.14	0.37		0.17	0.22		0.20	0.25	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	113	1456		243	1812		577	738		362	873	
v/s Ratio Prot	0.06	0.17		c0.11	c0.33		0.13	c0.21		c0.19	c0.13	
v/s Ratio Perm												
v/c Ratio	0.97	0.57		0.82	0.90		0.78	0.95		0.94	0.53	
Uniform Delay, d1	51.4	32.9		46.2	32.9		43.8	42.4		43.1	35.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	75.7	1.6		19.7	7.8		6.6	20.7		31.6	0.6	
Delay (s)	127.2	34.5		65.8	40.7		50.4	63.1		74.7	35.9	
Level of Service	F	C		E	D		D	E		E	D	
Approach Delay (s)		45.0			43.4			58.3			52.0	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM Average Control Delay	48.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	0.95		0.91	0.91	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (prot)	1770	5057		1770	5085	1583	1770	3256		1610	3256	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (perm)	1770	5057		1770	5085	1583	1770	3256		1610	3256	1583
Volume (vph)	288	792	30	40	1256	400	80	70	80	380	40	464
Peak-hour factor, PHF	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. Flow (vph)	288	792	30	40	1256	400	80	70	80	380	40	464
RTOR Reduction (vph)	0	2	0	0	0	206	0	73	0	0	0	385
Lane Group Flow (vph)	288	820	0	40	1256	194	80	77	0	190	230	79
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases						6						4
Actuated Green, G (s)	15.0	67.6		5.6	58.2	58.2	10.3	10.3		20.5	20.5	20.5
Effective Green, g (s)	15.0	67.6		5.6	58.2	58.2	10.3	10.3		20.5	20.5	20.5
Actuated g/C Ratio	0.12	0.56		0.05	0.49	0.49	0.09	0.09		0.17	0.17	0.17
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	221	2849		83	2466	768	152	279		275	556	270
v/s Ratio Prot	c0.16	0.16		0.02	c0.25		c0.05	0.02		c0.12	0.07	
v/s Ratio Perm						0.12						0.05
v/c Ratio	1.30	0.29		0.48	0.51	0.25	0.53	0.28		0.69	0.41	0.29
Uniform Delay, d1	52.5	13.7		55.8	21.1	18.1	52.5	51.4		46.8	44.4	43.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	165.3	0.3		4.4	0.8	0.8	3.3	0.5		7.3	0.5	0.6
Delay (s)	217.8	13.9		60.1	21.9	18.9	55.8	51.9		54.1	44.9	44.0
Level of Service	F	B		E	C	B	E	D		D	D	D
Approach Delay (s)		66.8			22.1			53.2			46.4	
Approach LOS		E			C			D			D	

Intersection Summary			
HCM Average Control Delay	42.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1863	1583	1770	1653	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.70	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	1313	1863	1583	1386	1653	
Volume (vph)	110	892	220	170	1316	140	300	20	130	70	20	60
Peak-hour factor, PHF	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. Flow (vph)	110	892	220	170	1316	140	300	20	130	70	20	60
RTOR Reduction (vph)	0	0	104	0	0	64	0	0	99	0	46	0
Lane Group Flow (vph)	110	892	116	170	1316	76	300	20	31	70	34	0
Turn Type	Prot		Perm	Prot		Perm	Perm		Perm	Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4			8	2		2	6		
Actuated Green, G (s)	11.9	57.8	57.8	14.2	60.1	60.1	26.0	26.0	26.0	26.0	26.0	
Effective Green, g (s)	11.9	57.8	57.8	14.2	60.1	60.1	26.0	26.0	26.0	26.0	26.0	
Actuated g/C Ratio	0.11	0.53	0.53	0.13	0.55	0.55	0.24	0.24	0.24	0.24	0.24	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	191	2672	832	228	2778	865	310	440	374	328	391	
v/s Ratio Prot	0.06	0.18		c0.10	c0.26			0.01			0.02	
v/s Ratio Perm			0.07			0.05	c0.23		0.02	0.05		
v/c Ratio	0.58	0.33	0.14	0.75	0.47	0.09	0.97	0.05	0.08	0.21	0.09	
Uniform Delay, d1	46.7	15.0	13.4	46.2	15.3	11.9	41.6	32.4	32.7	33.8	32.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.2	0.3	0.3	12.4	0.6	0.2	41.9	0.0	0.1	0.3	0.1	
Delay (s)	50.8	15.4	13.7	58.6	15.9	12.1	83.5	32.5	32.8	34.1	32.8	
Level of Service	D	B	B	E	B	B	F	C	C	C	C	
Approach Delay (s)		18.3			20.0			66.6			33.4	
Approach LOS		B			B			E			C	

Intersection Summary			
HCM Average Control Delay	26.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.92		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1723		1770	3446		1770	3518	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1723		1770	3446		1770	3518	
Volume (vph)	70	40	50	110	60	60	100	708	150	80	734	30
Peak-hour factor, PHF	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. Flow (vph)	70	40	50	110	60	60	100	708	150	80	734	30
RTOR Reduction (vph)	0	0	46	0	50	0	0	16	0	0	3	0
Lane Group Flow (vph)	70	40	4	110	70	0	100	842	0	80	761	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	5.6	5.8	5.8	8.1	8.3		7.9	42.9		5.4	40.4	
Effective Green, g (s)	5.6	5.8	5.8	8.1	8.3		7.9	42.9		5.4	40.4	
Actuated g/C Ratio	0.07	0.07	0.07	0.10	0.11		0.10	0.55		0.07	0.52	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	127	138	117	183	183		179	1890		122	1817	
v/s Ratio Prot	0.04	0.02		c0.06	c0.04		c0.06	c0.24		0.05	0.22	
v/s Ratio Perm			0.00									
v/c Ratio	0.55	0.29	0.03	0.60	0.38		0.56	0.45		0.66	0.42	
Uniform Delay, d1	35.1	34.3	33.6	33.5	32.6		33.5	10.5		35.5	11.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.1	1.2	0.1	5.5	1.3		3.7	0.8		12.0	0.7	
Delay (s)	40.2	35.4	33.7	39.0	33.9		37.2	11.3		47.5	12.4	
Level of Service	D	D	C	D	C		D	B		D	B	
Approach Delay (s)		37.0			36.3			14.0			15.7	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM Average Control Delay	18.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	78.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.92		1.00	1.00	0.85	1.00	0.96		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1709		1770	1863	1583	1770	3388		1770	3474	
Flt Permitted	0.69	1.00		0.63	1.00	1.00	0.24	1.00		0.19	1.00	
Satd. Flow (perm)	1290	1709		1178	1863	1583	449	3388		357	3474	
Volume (vph)	170	90	110	254	100	195	90	900	358	315	860	120
Peak-hour factor, PHF	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. Flow (vph)	170	90	110	254	100	195	90	900	358	315	860	120
RTOR Reduction (vph)	0	45	0	0	0	38	0	85	0	0	21	0
Lane Group Flow (vph)	170	155	0	254	100	157	90	1173	0	315	959	0
Turn Type	Perm			Perm		Perm	Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	11.1	11.1		11.1	11.1	11.1	20.9	20.9		20.9	20.9	
Effective Green, g (s)	11.1	11.1		11.1	11.1	11.1	20.9	20.9		20.9	20.9	
Actuated g/C Ratio	0.28	0.28		0.28	0.28	0.28	0.52	0.52		0.52	0.52	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	358	474		327	517	439	235	1770		187	1815	
v/s Ratio Prot		0.09			0.05			0.35			0.28	
v/s Ratio Perm	0.13			c0.22		0.10	0.20			c0.88		
v/c Ratio	0.47	0.33		0.78	0.19	0.36	0.38	0.66		1.68	0.53	
Uniform Delay, d1	12.0	11.5		13.3	11.0	11.6	5.7	7.0		9.6	6.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	0.4		11.0	0.2	0.5	4.7	2.0		330.1	1.1	
Delay (s)	13.0	11.9		24.3	11.2	12.1	10.4	9.0		339.7	7.4	
Level of Service	B	B		C	B	B	B	A		F	A	
Approach Delay (s)		12.4			17.6			9.0			88.2	
Approach LOS		B			B			A			F	

Intersection Summary			
HCM Average Control Delay	39.5	HCM Level of Service	D
HCM Volume to Capacity ratio	1.37		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	92.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3428		1770	3539	1770	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3428		1770	3539	1770	1583
Volume (vph)	566	150	421	836	40	278
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	566	150	421	836	40	278
RTOR Reduction (vph)	22	0	0	0	0	225
Lane Group Flow (vph)	694	0	421	836	40	53
Turn Type			Prot			Perm
Protected Phases	4		3	8	2	
Permitted Phases						2
Actuated Green, G (s)	36.4		32.6	73.0	19.0	19.0
Effective Green, g (s)	36.4		32.6	73.0	19.0	19.0
Actuated g/C Ratio	0.36		0.33	0.73	0.19	0.19
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1248		577	2583	336	301
v/s Ratio Prot	c0.20		c0.24	0.24	0.02	
v/s Ratio Perm						c0.03
v/c Ratio	0.56		0.73	0.32	0.12	0.18
Uniform Delay, d1	25.4		29.8	4.8	33.6	33.9
Progression Factor	1.00		0.61	0.39	1.00	1.00
Incremental Delay, d2	1.8		4.1	0.3	0.7	1.3
Delay (s)	27.2		22.2	2.1	34.3	35.2
Level of Service	C		C	A	C	D
Approach Delay (s)	27.2			8.8	35.1	
Approach LOS	C			A	D	

Intersection Summary			
HCM Average Control Delay	18.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.85		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3455		1770	3494		1770	1583		1770	1676	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3455		1770	3494		1770	1583		1770	1676	
Volume (vph)	60	636	120	182	1078	100	90	0	95	50	20	40
Peak-hour factor, PHF	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. Flow (vph)	60	636	120	182	1078	100	90	0	95	50	20	40
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	0	0	37	0
Lane Group Flow (vph)	60	756	0	182	1172	0	90	95	0	50	23	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	7.7	41.3		26.8	60.4		7.7	11.1		4.8	8.2	
Effective Green, g (s)	7.7	41.3		26.8	60.4		7.7	11.1		4.8	8.2	
Actuated g/C Ratio	0.08	0.41		0.27	0.60		0.08	0.11		0.05	0.08	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	136	1427		474	2110		136	176		85	137	
v/s Ratio Prot	0.03	c0.22		0.10	c0.34		c0.05	c0.06		0.03	0.01	
v/s Ratio Perm												
v/c Ratio	0.44	0.53		0.38	0.56		0.66	0.54		0.59	0.17	
Uniform Delay, d1	44.1	22.1		29.9	11.8		44.9	42.0		46.6	42.7	
Progression Factor	0.88	1.53		1.05	1.03		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	1.2		0.5	0.9		11.5	3.2		10.0	0.6	
Delay (s)	40.6	35.0		31.7	13.1		56.3	45.2		56.6	43.3	
Level of Service	D	C		C	B		E	D		E	D	
Approach Delay (s)		35.4			15.6			50.6			49.4	
Approach LOS		D			B			D			D	

Intersection Summary			
HCM Average Control Delay	26.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0					4.0	4.0	4.0
Lane Util. Factor		0.95			0.95					0.95	0.95	1.00
Frt		1.00			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	0.95	1.00
Satd. Flow (prot)		3532			3539					1681	1681	1583
Flt Permitted		1.00			1.00					0.95	0.95	1.00
Satd. Flow (perm)		3532			3539					1681	1681	1583
Volume (vph)	0	770	11	0	890	0	0	0	0	720	0	471
Peak-hour factor, PHF	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. Flow (vph)	0	770	11	0	890	0	0	0	0	720	0	471
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	781	0	0	890	0	0	0	0	360	360	471
Turn Type										Perm		custom
Protected Phases		2			6						4	4
Permitted Phases										4		4
Actuated Green, G (s)		56.9			56.9					35.1	35.1	35.1
Effective Green, g (s)		56.9			56.9					35.1	35.1	35.1
Actuated g/C Ratio		0.57			0.57					0.35	0.35	0.35
Clearance Time (s)		4.0			4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2010			2014					590	590	556
v/s Ratio Prot		0.22			c0.25							c0.30
v/s Ratio Perm										0.21	0.21	
v/c Ratio		0.39			0.44					0.61	0.61	0.85
Uniform Delay, d1		11.9			12.4					26.8	26.8	30.0
Progression Factor		0.09			0.24					1.00	1.00	1.00
Incremental Delay, d2		0.5			0.7					1.9	1.9	11.4
Delay (s)		1.6			3.7					28.7	28.7	41.4
Level of Service		A			A					C	C	D
Approach Delay (s)		1.6			3.7			0.0			33.7	
Approach LOS		A			A			A			C	

Intersection Summary			
HCM Average Control Delay	15.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	91.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	0.95			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	1770	3539			3539	1583		1770	1583			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	1770	3539			3539	1583		1770	1583			
Volume (vph)	150	1340	0	0	959	730	41	0	210	0	0	0
Peak-hour factor, PHF	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. Flow (vph)	150	1340	0	0	959	730	41	0	210	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	150	1340	0	0	959	730	0	41	210	0	0	0
Turn Type	Prot					Perm	Perm		custom			
Protected Phases	5	2			6			8	8			
Permitted Phases						6	8		8			
Actuated Green, G (s)	16.0	76.1			56.1	56.1		15.9	15.9			
Effective Green, g (s)	16.0	76.1			56.1	56.1		15.9	15.9			
Actuated g/C Ratio	0.16	0.76			0.56	0.56		0.16	0.16			
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)	283	2693			1985	888		281	252			
v/s Ratio Prot	0.08	c0.38			0.27				c0.13			
v/s Ratio Perm						c0.46		0.02				
v/c Ratio	0.53	0.50			0.48	0.82		0.15	0.83			
Uniform Delay, d1	38.5	4.6			13.2	17.9		36.2	40.8			
Progression Factor	0.89	0.60			0.12	0.20		1.00	1.00			
Incremental Delay, d2	1.8	0.6			0.6	5.8		0.2	20.4			
Delay (s)	36.3	3.4			2.2	9.4		36.4	61.2			
Level of Service	D	A			A	A		D	E			
Approach Delay (s)		6.7			5.3			57.2			0.0	
Approach LOS		A			A			E			A	

Intersection Summary			
HCM Average Control Delay	9.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.92		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	1770	4944		3433	3264		1770	3427	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	1770	4944		3433	3264		1770	3427	
Volume (vph)	100	1160	290	260	969	220	610	270	290	230	410	110
Peak-hour factor, PHF	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. Flow (vph)	100	1160	290	260	969	220	610	270	290	230	410	110
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	100	1160	290	260	1189	0	610	560	0	230	520	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	9.6	29.2	29.2	17.0	36.6		20.3	22.5		15.3	17.5	
Effective Green, g (s)	9.6	29.2	29.2	17.0	36.6		20.3	22.5		15.3	17.5	
Actuated g/C Ratio	0.10	0.29	0.29	0.17	0.37		0.20	0.22		0.15	0.18	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	170	1485	462	301	1810		697	734		271	600	
v/s Ratio Prot	0.06	c0.23		c0.15	0.24		c0.18	0.17		0.13	c0.15	
v/s Ratio Perm			0.18									
v/c Ratio	0.59	0.78	0.63	0.86	0.66		0.88	0.76		0.85	0.87	
Uniform Delay, d1	43.3	32.5	30.7	40.4	26.5		38.6	36.3		41.2	40.1	
Progression Factor	0.92	0.91	0.90	0.68	0.34		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.4	3.6	5.4	19.0	1.6		11.8	4.7		21.2	12.5	
Delay (s)	44.1	33.0	33.0	46.3	10.7		50.5	41.0		62.4	52.6	
Level of Service	D	C	C	D	B		D	D		E	D	
Approach Delay (s)		33.7			17.1			45.9			55.6	
Approach LOS		C			B			D			E	

Intersection Summary			
HCM Average Control Delay	35.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	5085	5054		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	5085	5054		1770	1583
Volume (vph)	340	1340	1159	50	130	290
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	340	1340	1159	50	130	290
RTOR Reduction (vph)	0	0	6	0	0	167
Lane Group Flow (vph)	340	1340	1203	0	130	123
Turn Type	Prot					Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	15.3	49.5	30.2		42.5	42.5
Effective Green, g (s)	15.3	49.5	30.2		42.5	42.5
Actuated g/C Ratio	0.15	0.50	0.30		0.42	0.42
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	525	2517	1526		752	673
v/s Ratio Prot	c0.10	0.26	c0.24		0.07	
v/s Ratio Perm						c0.08
v/c Ratio	0.65	0.53	0.79		0.17	0.18
Uniform Delay, d1	39.8	17.3	32.0		17.8	17.9
Progression Factor	1.21	1.28	0.84		1.00	1.00
Incremental Delay, d2	1.7	0.1	2.4		0.5	0.6
Delay (s)	50.0	22.4	29.2		18.3	18.5
Level of Service	D	C	C		B	B
Approach Delay (s)		28.0	29.2		18.5	
Approach LOS		C	C		B	

Intersection Summary			
HCM Average Control Delay	27.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	1770	3463		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	3539	1583	1770	3463		1770	3539	1583
Volume (vph)	420	890	160	50	686	50	110	360	60	60	300	413
Peak-hour factor, PHF	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. Flow (vph)	420	890	160	50	686	50	110	360	60	60	300	413
RTOR Reduction (vph)	0	0	78	0	0	29	0	15	0	0	0	309
Lane Group Flow (vph)	420	890	82	50	686	21	110	405	0	60	300	104
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	17.1	51.4	51.4	6.8	41.1	41.1	9.9	19.0		6.8	15.9	15.9
Effective Green, g (s)	17.1	51.4	51.4	6.8	41.1	41.1	9.9	19.0		6.8	15.9	15.9
Actuated g/C Ratio	0.17	0.51	0.51	0.07	0.41	0.41	0.10	0.19		0.07	0.16	0.16
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	587	1819	814	120	1455	651	175	658		120	563	252
v/s Ratio Prot	c0.12	c0.25		0.03	0.19		c0.06	c0.12		0.03	0.08	
v/s Ratio Perm			0.05			0.01						0.07
v/c Ratio	0.72	0.49	0.10	0.42	0.47	0.03	0.63	0.62		0.50	0.53	0.41
Uniform Delay, d1	39.2	15.8	12.5	44.7	21.5	17.6	43.3	37.2		45.0	38.6	37.8
Progression Factor	0.72	1.49	2.92	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.9	0.9	0.2	2.3	1.1	0.1	6.9	1.7		3.3	1.0	1.1
Delay (s)	32.2	24.3	36.6	47.0	22.6	17.7	50.2	38.9		48.2	39.6	38.9
Level of Service	C	C	D	D	C	B	D	D		D	D	D
Approach Delay (s)		27.9			23.9			41.2			39.9	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	31.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.91	0.91	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.86	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	1770	2933	1441	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	1770	2933	1441	1770	1863	1583
Volume (vph)	69	1710	60	530	1090	464	220	20	360	229	20	84
Peak-hour factor, PHF	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. Flow (vph)	69	1710	60	530	1090	464	220	20	360	229	20	84
RTOR Reduction (vph)	0	0	32	0	0	202	0	166	166	0	0	78
Lane Group Flow (vph)	69	1710	28	530	1090	262	220	34	14	229	20	6
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	6.4	46.3	46.3	22.1	62.0	62.0	18.1	8.7	8.7	16.9	7.5	7.5
Effective Green, g (s)	6.4	46.3	46.3	22.1	62.0	62.0	18.1	8.7	8.7	16.9	7.5	7.5
Actuated g/C Ratio	0.06	0.42	0.42	0.20	0.56	0.56	0.16	0.08	0.08	0.15	0.07	0.07
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	200	2140	666	690	2866	892	291	232	114	272	127	108
v/s Ratio Prot	0.02	c0.34		c0.15	0.21		0.12	c0.01		c0.13	0.01	
v/s Ratio Perm			0.02			0.17			0.01			0.00
v/c Ratio	0.34	0.80	0.04	0.77	0.38	0.29	0.76	0.15	0.12	0.84	0.16	0.05
Uniform Delay, d1	49.8	27.8	18.8	41.5	13.3	12.5	43.8	47.2	47.1	45.3	48.3	47.9
Progression Factor	1.00	1.00	1.00	0.69	1.11	4.99	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	3.2	0.1	4.4	0.3	0.7	10.7	0.3	0.5	20.4	0.6	0.2
Delay (s)	50.8	31.0	18.9	33.2	15.1	63.3	54.5	47.5	47.6	65.6	48.9	48.1
Level of Service	D	C	B	C	B	E	D	D	D	E	D	D
Approach Delay (s)		31.4			30.4			50.1			60.2	
Approach LOS		C			C			D			E	

Intersection Summary			
HCM Average Control Delay	35.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.91	1.00	0.97	0.91					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5085	1583	3433	5085					1681	1681	1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5085	1583	3433	5085					1681	1681	1583
Volume (vph)	0	2051	368	380	1844	0	0	0	0	849	0	240
Peak-hour factor, PHF	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. Flow (vph)	0	2051	368	380	1844	0	0	0	0	849	0	240
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2051	368	380	1844	0	0	0	0	425	424	240
Turn Type			Perm	Prot						Split		Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		52.2	52.2	15.0	71.2					30.8	30.8	30.8
Effective Green, g (s)		52.2	52.2	15.0	71.2					30.8	30.8	30.8
Actuated g/C Ratio		0.47	0.47	0.14	0.65					0.28	0.28	0.28
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2413	751	468	3291					471	471	443
v/s Ratio Prot		c0.40		c0.11	0.36					c0.25	0.25	
v/s Ratio Perm			0.23									0.15
v/c Ratio		0.85	0.49	0.81	0.56					0.90	0.90	0.54
Uniform Delay, d1		25.5	19.8	46.1	10.7					38.2	38.1	33.6
Progression Factor		0.66	0.51	0.95	0.72					1.00	1.00	1.00
Incremental Delay, d2		2.9	1.6	9.1	0.6					20.3	20.0	1.4
Delay (s)		19.6	11.7	53.1	8.3					58.4	58.1	35.0
Level of Service		B	B	D	A					E	E	C
Approach Delay (s)		18.4			16.0			0.0			53.2	
Approach LOS		B			B			A			D	

Intersection Summary			
HCM Average Control Delay	24.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor		0.91	1.00	0.97	0.91	1.00	0.97	1.00	1.00			
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)		5085	1583	3433	5085	1583	3433	1863	1583			
Flt Permitted		1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)		5085	1583	3433	5085	1583	3433	1863	1583			
Volume (vph)	0	2620	280	60	1695	711	530	50	340	0	0	0
Peak-hour factor, PHF	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. Flow (vph)	0	2620	280	60	1695	711	530	50	340	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2620	280	60	1695	711	530	50	340	0	0	0
Turn Type			Perm	Prot		Perm	Perm		Perm			
Protected Phases		2		1	6			8				
Permitted Phases			2			6	8		8			
Actuated Green, G (s)		67.7	67.7	3.2	74.9	74.9	27.1	27.1	27.1			
Effective Green, g (s)		67.7	67.7	3.2	74.9	74.9	27.1	27.1	27.1			
Actuated g/C Ratio		0.62	0.62	0.03	0.68	0.68	0.25	0.25	0.25			
Clearance Time (s)		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)		3130	974	100	3462	1078	846	459	390			
v/s Ratio Prot		c0.52		0.02	0.33			0.03				
v/s Ratio Perm			0.18			c0.45	0.15		c0.21			
v/c Ratio		0.84	0.29	0.60	0.49	0.66	0.63	0.11	0.87			
Uniform Delay, d1		16.8	9.9	52.8	8.4	10.2	36.9	32.1	39.8			
Progression Factor		0.29	0.27	1.12	1.76	1.63	1.00	1.00	1.00			
Incremental Delay, d2		1.4	0.4	4.0	0.2	1.3	1.5	0.1	18.8			
Delay (s)		6.3	3.1	63.3	15.0	17.8	38.4	32.2	58.5			
Level of Service		A	A	E	B	B	D	C	E			
Approach Delay (s)		6.0			17.0			45.5			0.0	
Approach LOS		A			B			D			A	

Intersection Summary			
HCM Average Control Delay	16.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		0.97	0.95		0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	5055		3433	3445		3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	5055		3433	3445		3433	3539	1583
Volume (vph)	470	1970	530	50	1476	60	400	370	80	80	550	570
Peak-hour factor, PHF	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. Flow (vph)	470	1970	530	50	1476	60	400	370	80	80	550	570
RTOR Reduction (vph)	0	0	57	0	4	0	0	16	0	0	0	264
Lane Group Flow (vph)	470	1970	473	50	1532	0	400	434	0	80	550	306
Turn Type	Prot		pm+ov	Prot			Prot			Prot		Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2									4
Actuated Green, G (s)	22.8	53.0	67.3	6.2	36.4		14.3	30.6		4.2	20.5	20.5
Effective Green, g (s)	22.8	53.0	67.3	6.2	36.4		14.3	30.6		4.2	20.5	20.5
Actuated g/C Ratio	0.21	0.48	0.61	0.06	0.33		0.13	0.28		0.04	0.19	0.19
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	712	2450	969	100	1673		446	958		131	660	295
v/s Ratio Prot	c0.14	c0.39	0.06	0.03	c0.30		c0.12	0.13		0.02	0.16	
v/s Ratio Perm			0.24									c0.19
v/c Ratio	0.66	0.80	0.49	0.50	0.92		0.90	0.45		0.61	0.83	1.04
Uniform Delay, d1	40.0	24.1	11.8	50.4	35.3		47.1	32.8		52.1	43.1	44.8
Progression Factor	0.76	0.41	0.33	0.77	1.23		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.3	1.6	0.2	3.4	8.3		20.2	0.3		8.2	8.9	62.0
Delay (s)	31.7	11.5	4.1	42.4	51.7		67.3	33.1		60.3	52.0	106.7
Level of Service	C	B	A	D	D		E	C		E	D	F
Approach Delay (s)		13.4			51.4			49.2			78.5	
Approach LOS		B			D			D			E	

Intersection Summary			
HCM Average Control Delay	39.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	1.00	1.00	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	3433	1863	1583	3433	3274	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	3433	1863	1583	3433	3274	
Volume (vph)	160	1370	600	20	926	160	440	120	40	310	220	220
Peak-hour factor, PHF	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. Flow (vph)	160	1370	600	20	926	160	440	120	40	310	220	220
RTOR Reduction (vph)	0	0	280	0	0	93	0	0	36	0	187	0
Lane Group Flow (vph)	160	1370	320	20	926	67	440	120	4	310	253	0
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	20.4	58.7	58.7	3.1	41.4	41.4	19.2	12.0	12.0	20.2	13.0	
Effective Green, g (s)	20.4	58.7	58.7	3.1	41.4	41.4	19.2	12.0	12.0	20.2	13.0	
Actuated g/C Ratio	0.19	0.53	0.53	0.03	0.38	0.38	0.17	0.11	0.11	0.18	0.12	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	328	2714	845	50	1914	596	599	203	173	630	387	
v/s Ratio Prot	0.09	c0.27		0.01	c0.18		c0.13	0.06		0.09	c0.08	
v/s Ratio Perm			0.20			0.04			0.00			
v/c Ratio	0.49	0.50	0.38	0.40	0.48	0.11	0.73	0.59	0.03	0.49	0.65	
Uniform Delay, d1	40.1	16.4	15.0	52.5	26.2	22.3	43.0	46.7	43.8	40.3	46.4	
Progression Factor	0.52	0.21	0.93	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.7	0.4	0.8	5.2	0.9	0.4	4.7	4.6	0.1	0.6	3.9	
Delay (s)	21.8	3.9	14.7	57.7	27.0	22.7	47.6	51.2	43.8	40.9	50.3	
Level of Service	C	A	B	E	C	C	D	D	D	D	D	
Approach Delay (s)		8.3			27.0			48.1			46.4	
Approach LOS		A			C			D			D	

Intersection Summary			
HCM Average Control Delay	24.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0		3.5	4.0		3.5	4.0		3.5	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		0.97	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.98		1.00	0.95		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5012		1770	5007		3433	3374		1770	3419	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5012		1770	5007		3433	3374		1770	3419	
Volume (vph)	320	1782	190	190	1400	160	260	400	180	310	510	150
Peak-hour factor, PHF	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. Flow (vph)	320	1782	190	190	1400	160	260	400	180	310	510	150
RTOR Reduction (vph)	0	11	0	0	13	0	0	47	0	0	25	0
Lane Group Flow (vph)	320	1961	0	190	1547	0	260	533	0	310	635	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	20.0	47.0		12.0	39.0		10.0	18.0		17.0	25.0	
Effective Green, g (s)	20.5	47.0		12.5	39.0		10.5	18.0		17.5	25.0	
Actuated g/C Ratio	0.19	0.43		0.11	0.35		0.10	0.16		0.16	0.23	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	330	2141		201	1775		328	552		282	777	
v/s Ratio Prot	c0.18	c0.39		0.11	0.31		0.08	c0.16		c0.18	0.19	
v/s Ratio Perm												
v/c Ratio	0.97	0.92		0.95	0.87		0.79	0.97		1.10	0.82	
Uniform Delay, d1	44.4	29.6		48.4	33.2		48.7	45.7		46.2	40.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	40.9	7.6		47.6	6.2		12.3	29.5		82.8	6.7	
Delay (s)	85.3	37.2		96.1	39.4		61.0	75.2		129.1	47.0	
Level of Service	F	D		F	D		E	E		F	D	
Approach Delay (s)		44.0			45.5			70.8			73.2	
Approach LOS		D			D			E			E	

Intersection Summary			
HCM Average Control Delay	53.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	96.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	0.95		0.91	0.91	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00
Satd. Flow (prot)	1770	5049		1770	5085	1583	1770	3294		1610	3274	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00
Satd. Flow (perm)	1770	5049		1770	5085	1583	1770	3294		1610	3274	1583
Volume (vph)	703	1619	80	100	1174	480	50	70	60	580	120	446
Peak-hour factor, PHF	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. Flow (vph)	703	1619	80	100	1174	480	50	70	60	580	120	446
RTOR Reduction (vph)	0	4	0	0	0	368	0	56	0	0	0	349
Lane Group Flow (vph)	703	1695	0	100	1174	112	50	74	0	290	410	97
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases						6						4
Actuated Green, G (s)	43.2	57.2		12.0	26.0	26.0	8.7	8.7		26.1	26.1	26.1
Effective Green, g (s)	43.2	57.2		12.0	26.0	26.0	8.7	8.7		26.1	26.1	26.1
Actuated g/C Ratio	0.36	0.48		0.10	0.22	0.22	0.07	0.07		0.22	0.22	0.22
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	637	2407		177	1102	343	128	239		350	712	344
v/s Ratio Prot	c0.40	0.34		0.06	c0.23		c0.03	0.02		c0.18	0.13	
v/s Ratio Perm						0.07						0.06
v/c Ratio	1.10	0.70		0.56	1.07	0.33	0.39	0.31		0.83	0.58	0.28
Uniform Delay, d1	38.4	24.7		51.5	47.0	39.6	53.1	52.8		44.8	42.0	39.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	67.4	1.8		4.1	46.3	2.5	2.0	0.7		14.8	1.1	0.5
Delay (s)	105.8	26.5		55.6	93.3	42.1	55.1	53.6		59.7	43.1	39.6
Level of Service	F	C		E	F	D	E	D		E	D	D
Approach Delay (s)		49.7			77.2			54.0			45.9	
Approach LOS		D			E			D			D	

Intersection Summary			
HCM Average Control Delay	57.8	HCM Level of Service	E
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	94.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1863	1583	1770	1637	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.53	1.00	1.00	0.72	1.00	
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	985	1863	1583	1349	1637	
Volume (vph)	190	1649	390	300	1204	90	320	50	220	70	40	170
Peak-hour factor, PHF	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. Flow (vph)	190	1649	390	300	1204	90	320	50	220	70	40	170
RTOR Reduction (vph)	0	0	186	0	0	53	0	0	147	0	113	0
Lane Group Flow (vph)	190	1649	204	300	1204	37	320	50	73	70	97	0
Turn Type	Prot		Perm	Prot		Perm	Perm		Perm	Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4			8	2		2	6		
Actuated Green, G (s)	16.1	41.5	41.5	19.9	45.3	45.3	36.6	36.6	36.6	36.6	36.6	
Effective Green, g (s)	16.1	41.5	41.5	19.9	45.3	45.3	36.6	36.6	36.6	36.6	36.6	
Actuated g/C Ratio	0.15	0.38	0.38	0.18	0.41	0.41	0.33	0.33	0.33	0.33	0.33	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	259	1918	597	320	2094	652	328	620	527	449	545	
v/s Ratio Prot	0.11	c0.32		c0.17	c0.24			0.03			0.06	
v/s Ratio Perm			0.13			0.02	c0.32		0.05	0.05		
v/c Ratio	0.73	0.86	0.34	0.94	0.57	0.06	0.98	0.08	0.14	0.16	0.18	
Uniform Delay, d1	44.9	31.6	24.5	44.4	24.9	19.5	36.3	25.2	25.7	25.8	26.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	10.3	5.3	1.6	33.9	1.2	0.2	42.7	0.1	0.1	0.2	0.2	
Delay (s)	55.2	36.9	26.0	78.4	26.1	19.7	79.0	25.2	25.8	26.0	26.2	
Level of Service	E	D	C	E	C	B	E	C	C	C	C	
Approach Delay (s)		36.5			35.6			54.6			26.1	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM Average Control Delay	37.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.90		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1683		1770	3506		1770	3497	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1683		1770	3506		1770	3497	
Volume (vph)	70	20	100	120	50	90	100	1053	70	110	916	80
Peak-hour factor, PHF	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. Flow (vph)	70	20	100	120	50	90	100	1053	70	110	916	80
RTOR Reduction (vph)	0	0	90	0	78	0	0	4	0	0	6	0
Lane Group Flow (vph)	70	20	10	120	62	0	100	1119	0	110	990	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	6.1	8.4	8.4	8.7	11.0		8.4	42.2		7.9	41.7	
Effective Green, g (s)	6.1	8.4	8.4	8.7	11.0		8.4	42.2		7.9	41.7	
Actuated g/C Ratio	0.07	0.10	0.10	0.10	0.13		0.10	0.51		0.09	0.50	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	130	188	160	185	223		179	1778		168	1753	
v/s Ratio Prot	0.04	0.01		c0.07	c0.04		0.06	c0.32		c0.06	0.28	
v/s Ratio Perm			0.01									
v/c Ratio	0.54	0.11	0.06	0.65	0.28		0.56	0.63		0.65	0.56	
Uniform Delay, d1	37.2	34.0	33.8	35.8	32.5		35.6	14.8		36.3	14.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.2	0.3	0.2	7.6	0.7		3.7	1.7		8.8	1.3	
Delay (s)	41.4	34.2	34.0	43.4	33.2		39.4	16.5		45.2	15.8	
Level of Service	D	C	C	D	C		D	B		D	B	
Approach Delay (s)		36.8			37.9			18.4			18.7	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM Average Control Delay	21.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	83.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1701		1770	1863	1583	1770	3419		1770	3436	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1701		1770	1863	1583	1770	3419		1770	3436	
Volume (vph)	140	80	110	346	120	240	90	970	283	273	910	220
Peak-hour factor, PHF	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. Flow (vph)	140	80	110	346	120	240	90	970	283	273	910	220
RTOR Reduction (vph)	0	46	0	0	0	194	0	20	0	0	15	0
Lane Group Flow (vph)	140	145	0	346	120	46	90	1233	0	273	1115	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	14.0	15.0		22.0	23.0	23.0	8.7	50.0		17.0	58.3	
Effective Green, g (s)	14.0	15.0		22.0	23.0	23.0	8.7	50.0		17.0	58.3	
Actuated g/C Ratio	0.12	0.12		0.18	0.19	0.19	0.07	0.42		0.14	0.49	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	207	213		325	357	303	128	1425		251	1669	
v/s Ratio Prot	0.08	c0.08		c0.20	0.06		0.05	c0.36		c0.15	0.32	
v/s Ratio Perm						0.03						
v/c Ratio	0.68	0.68		1.06	0.34	0.15	0.70	0.87		1.09	0.67	
Uniform Delay, d1	50.8	50.2		49.0	41.9	40.4	54.4	31.9		51.5	23.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.4	8.3		68.1	0.6	0.2	16.1	7.3		82.2	2.1	
Delay (s)	59.3	58.5		117.1	42.5	40.6	70.4	39.2		133.7	25.6	
Level of Service	E	E		F	D	D	E	D		F	C	
Approach Delay (s)		58.8			78.4			41.3			46.6	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM Average Control Delay	51.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	94.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Cumulative With Project

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Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3489		1770	3539	1770	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3489		1770	3539	1770	1583
Volume (vph)	960	100	260	670	120	290
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	960	100	260	670	120	290
RTOR Reduction (vph)	8	0	0	0	0	226
Lane Group Flow (vph)	1052	0	260	670	120	64
Turn Type			Prot			Perm
Protected Phases	4		3	8	2	
Permitted Phases						2
Actuated Green, G (s)	40.4		17.6	62.0	20.0	20.0
Effective Green, g (s)	40.4		17.6	62.0	20.0	20.0
Actuated g/C Ratio	0.45		0.20	0.69	0.22	0.22
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1566		346	2438	393	352
v/s Ratio Prot	c0.30		c0.15	0.19	c0.07	
v/s Ratio Perm						0.04
v/c Ratio	0.67		0.75	0.27	0.31	0.18
Uniform Delay, d1	19.6		34.1	5.4	29.2	28.4
Progression Factor	1.00		1.01	0.42	1.00	1.00
Incremental Delay, d2	2.3		8.4	0.3	2.0	1.1
Delay (s)	21.9		42.9	2.5	31.2	29.5
Level of Service	C		D	A	C	C
Approach Delay (s)	21.9			13.8	30.0	
Approach LOS	C			B	C	

Intersection Summary			
HCM Average Control Delay	20.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.99		1.00	0.86		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3350		1770	3516		1770	1599		1770	1676	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3350		1770	3516		1770	1599		1770	1676	
Volume (vph)	40	760	420	100	660	30	160	20	330	80	30	60
Peak-hour factor, PHF	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. Flow (vph)	40	760	420	100	660	30	160	20	330	80	30	60
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	50	0
Lane Group Flow (vph)	40	1180	0	100	687	0	160	350	0	80	40	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	3.6	39.8		7.2	43.4		12.2	22.2		4.8	14.8	
Effective Green, g (s)	3.6	39.8		7.2	43.4		12.2	22.2		4.8	14.8	
Actuated g/C Ratio	0.04	0.44		0.08	0.48		0.14	0.25		0.05	0.16	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	71	1481		142	1695		240	394		94	276	
v/s Ratio Prot	0.02	c0.35		c0.06	0.20		c0.09	c0.22		0.05	0.02	
v/s Ratio Perm												
v/c Ratio	0.56	0.80		0.70	0.41		0.67	0.89		0.85	0.14	
Uniform Delay, d1	42.4	21.6		40.4	15.0		37.0	32.7		42.2	32.2	
Progression Factor	0.93	1.68		0.91	0.92		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.0	3.7		14.1	0.7		6.8	20.8		48.3	0.2	
Delay (s)	47.5	40.1		51.0	14.5		43.8	53.5		90.6	32.4	
Level of Service	D	D		D	B		D	D		F	C	
Approach Delay (s)		40.3			19.1			50.4			59.8	
Approach LOS		D			B			D			E	

Intersection Summary			
HCM Average Control Delay	37.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0					4.0	4.0	4.0
Lane Util. Factor		0.95			0.95					0.95	0.95	1.00
Frt		0.99			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	0.95	1.00
Satd. Flow (prot)		3498			3539					1681	1681	1583
Flt Permitted		1.00			1.00					0.95	0.95	1.00
Satd. Flow (perm)		3498			3539					1681	1681	1583
Volume (vph)	0	1080	90	0	450	0	0	0	0	840	0	340
Peak-hour factor, PHF	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. Flow (vph)	0	1080	90	0	450	0	0	0	0	840	0	340
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1170	0	0	450	0	0	0	0	420	420	340
Turn Type										Perm		custom
Protected Phases		2			6						4	4
Permitted Phases										4		4
Actuated Green, G (s)		53.4			53.4					28.6	28.6	28.6
Effective Green, g (s)		53.4			53.4					28.6	28.6	28.6
Actuated g/C Ratio		0.59			0.59					0.32	0.32	0.32
Clearance Time (s)		4.0			4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2075			2100					534	534	503
v/s Ratio Prot		c0.33			0.13							0.21
v/s Ratio Perm										c0.25	0.25	
v/c Ratio		0.56			0.21					0.79	0.79	0.68
Uniform Delay, d1		11.2			8.5					27.9	27.9	26.7
Progression Factor		0.42			0.07					1.00	1.00	1.00
Incremental Delay, d2		0.7			0.2					7.5	7.5	3.6
Delay (s)		5.4			0.8					35.4	35.4	30.3
Level of Service		A			A					D	D	C
Approach Delay (s)		5.4			0.8			0.0			33.9	
Approach LOS		A			A			A			C	

Intersection Summary			
HCM Average Control Delay	16.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	0.95			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	1770	3539			3539	1583		1770	1583			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	1770	3539			3539	1583		1770	1583			
Volume (vph)	260	1660	0	0	580	620	20	0	100	0	0	0
Peak-hour factor, PHF	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. Flow (vph)	260	1660	0	0	580	620	20	0	100	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	260	1660	0	0	580	620	0	20	100	0	0	0
Turn Type	Prot					Perm	Perm		custom			
Protected Phases	5	2			6			8	8			
Permitted Phases						6	8		8			
Actuated Green, G (s)	18.0	71.2			49.2	49.2		10.8	10.8			
Effective Green, g (s)	18.0	71.2			49.2	49.2		10.8	10.8			
Actuated g/C Ratio	0.20	0.79			0.55	0.55		0.12	0.12			
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)	354	2800			1935	865		212	190			
v/s Ratio Prot	c0.15	0.47			0.16				c0.06			
v/s Ratio Perm						c0.39		0.01				
v/c Ratio	0.73	0.59			0.30	0.72		0.09	0.53			
Uniform Delay, d1	33.8	3.7			11.1	15.2		35.2	37.2			
Progression Factor	1.03	0.96			0.07	0.22		1.00	1.00			
Incremental Delay, d2	6.4	0.8			0.3	4.1		0.2	2.6			
Delay (s)	41.2	4.3			1.1	7.4		35.4	39.8			
Level of Service	D	A			A	A		D	D			
Approach Delay (s)		9.3			4.3			39.1			0.0	
Approach LOS		A			A			D			A	

Intersection Summary			
HCM Average Control Delay	8.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.94		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	1770	4899		3433	3332		1770	3443	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	1770	4899		3433	3332		1770	3443	
Volume (vph)	160	970	630	260	990	320	170	250	160	130	180	40
Peak-hour factor, PHF	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. Flow (vph)	160	970	630	260	990	320	170	250	160	130	180	40
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	160	970	630	260	1310	0	170	410	0	130	220	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	15.0	37.5	37.5	14.7	37.2		11.0	14.8		7.0	10.8	
Effective Green, g (s)	15.0	37.5	37.5	14.7	37.2		11.0	14.8		7.0	10.8	
Actuated g/C Ratio	0.17	0.42	0.42	0.16	0.41		0.12	0.16		0.08	0.12	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	295	2119	660	289	2025		420	548		138	413	
v/s Ratio Prot	0.09	0.19		c0.15	0.27		0.05	c0.12		c0.07	0.06	
v/s Ratio Perm			c0.40									
v/c Ratio	0.54	0.46	0.95	0.90	0.65		0.40	0.75		0.94	0.53	
Uniform Delay, d1	34.4	18.9	25.4	36.9	21.1		36.5	35.8		41.3	37.2	
Progression Factor	0.84	0.74	0.75	0.70	0.57		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	0.6	22.4	25.1	1.4		0.6	5.5		58.8	1.3	
Delay (s)	30.4	14.6	41.4	51.1	13.4		37.1	41.4		100.1	38.6	
Level of Service	C	B	D	D	B		D	D		F	D	
Approach Delay (s)		25.6			19.6			40.1			61.4	
Approach LOS		C			B			D			E	

Intersection Summary			
HCM Average Control Delay	28.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	5085	5034		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	5085	5034		1770	1583
Volume (vph)	290	970	1260	90	60	310
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	290	970	1260	90	60	310
RTOR Reduction (vph)	0	0	9	0	0	219
Lane Group Flow (vph)	290	970	1342	0	60	91
Turn Type	Prot					Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	12.6	55.6	39.0		26.4	26.4
Effective Green, g (s)	12.6	55.6	39.0		26.4	26.4
Actuated g/C Ratio	0.14	0.62	0.43		0.29	0.29
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	481	3141	2181		519	464
v/s Ratio Prot	c0.08	0.19	c0.27		0.03	
v/s Ratio Perm						c0.06
v/c Ratio	0.60	0.31	0.62		0.12	0.20
Uniform Delay, d1	36.4	8.1	19.7		23.3	23.8
Progression Factor	0.91	1.48	0.61		1.00	1.00
Incremental Delay, d2	1.8	0.0	0.4		0.5	0.9
Delay (s)	34.7	12.1	12.5		23.7	24.8
Level of Service	C	B	B		C	C
Approach Delay (s)		17.3	12.5		24.6	
Approach LOS		B	B		C	

Intersection Summary			
HCM Average Control Delay	16.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	1770	3516		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	3539	1583	1770	3516		1770	3539	1583
Volume (vph)	300	680	50	70	860	140	140	220	10	40	310	350
Peak-hour factor, PHF	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. Flow (vph)	300	680	50	70	860	140	140	220	10	40	310	350
RTOR Reduction (vph)	0	0	28	0	0	85	0	4	0	0	0	236
Lane Group Flow (vph)	300	680	22	70	860	55	140	226	0	40	310	114
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	12.3	40.4	40.4	7.1	35.2	35.2	11.2	22.9		3.6	15.3	15.3
Effective Green, g (s)	12.3	40.4	40.4	7.1	35.2	35.2	11.2	22.9		3.6	15.3	15.3
Actuated g/C Ratio	0.14	0.45	0.45	0.08	0.39	0.39	0.12	0.25		0.04	0.17	0.17
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	469	1589	711	140	1384	619	220	895		71	602	269
v/s Ratio Prot	c0.09	0.19		0.04	c0.24		c0.08	0.06		0.02	c0.09	
v/s Ratio Perm			0.01			0.03						0.07
v/c Ratio	0.64	0.43	0.03	0.50	0.62	0.09	0.64	0.25		0.56	0.51	0.42
Uniform Delay, d1	36.8	16.9	13.9	39.7	22.0	17.3	37.5	26.7		42.4	34.0	33.4
Progression Factor	1.18	0.74	1.71	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.8	0.8	0.1	2.8	2.1	0.3	5.9	0.1		9.8	0.7	1.1
Delay (s)	46.1	13.3	23.7	42.5	24.1	17.6	43.4	26.9		52.3	34.7	34.5
Level of Service	D	B	C	D	C	B	D	C		D	C	C
Approach Delay (s)		23.4			24.5			33.1			35.6	
Approach LOS		C			C			C			D	

Intersection Summary			
HCM Average Control Delay	27.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.91	0.91	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	1770	2938	1441	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	1770	2938	1441	1770	1863	1583
Volume (vph)	60	950	20	260	1460	260	50	10	160	360	10	80
Peak-hour factor, PHF	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. Flow (vph)	60	950	20	260	1460	260	50	10	160	360	10	80
RTOR Reduction (vph)	0	0	12	0	0	125	0	74	74	0	0	60
Lane Group Flow (vph)	60	950	8	260	1460	135	50	16	6	360	10	20
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	3.2	46.5	46.5	14.0	57.3	57.3	6.2	7.8	7.8	25.7	27.3	27.3
Effective Green, g (s)	3.2	46.5	46.5	14.0	57.3	57.3	6.2	7.8	7.8	25.7	27.3	27.3
Actuated g/C Ratio	0.03	0.42	0.42	0.13	0.52	0.52	0.06	0.07	0.07	0.23	0.25	0.25
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	100	2150	669	437	2649	825	100	208	102	414	462	393
v/s Ratio Prot	0.02	c0.19		0.08	c0.29		0.03	c0.01		c0.20	0.01	
v/s Ratio Perm			0.01			0.09			0.00			0.01
v/c Ratio	0.60	0.44	0.01	0.59	0.55	0.16	0.50	0.08	0.06	0.87	0.02	0.05
Uniform Delay, d1	52.8	22.5	18.4	45.3	17.7	13.8	50.4	47.7	47.7	40.5	31.3	31.5
Progression Factor	1.00	1.00	1.00	0.64	0.87	1.14	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.7	0.7	0.0	1.9	0.7	0.4	3.9	0.2	0.2	17.4	0.0	0.1
Delay (s)	62.5	23.2	18.5	31.0	16.1	16.2	54.3	47.9	47.9	57.9	31.3	31.5
Level of Service	E	C	B	C	B	B	D	D	D	E	C	C
Approach Delay (s)		25.4			18.1			49.3			52.6	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM Average Control Delay	26.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.91	1.00	0.97	0.91					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5085	1583	3433	5085					1681	1681	1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5085	1583	3433	5085					1681	1681	1583
Volume (vph)	0	1170	300	160	1780	0	0	0	0	740	0	200
Peak-hour factor, PHF	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. Flow (vph)	0	1170	300	160	1780	0	0	0	0	740	0	200
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1170	300	160	1780	0	0	0	0	370	370	200
Turn Type			Perm	Prot						Split		Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		52.5	52.5	16.0	72.5					29.5	29.5	29.5
Effective Green, g (s)		52.5	52.5	16.0	72.5					29.5	29.5	29.5
Actuated g/C Ratio		0.48	0.48	0.15	0.66					0.27	0.27	0.27
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2427	756	499	3351					451	451	425
v/s Ratio Prot		0.23		0.05	c0.35					c0.22	0.22	
v/s Ratio Perm			0.19									0.13
v/c Ratio		0.48	0.40	0.32	0.53					0.82	0.82	0.47
Uniform Delay, d1		19.5	18.5	42.1	9.8					37.8	37.8	33.7
Progression Factor		1.05	1.01	1.11	0.95					1.00	1.00	1.00
Incremental Delay, d2		0.6	1.4	0.3	0.6					11.4	11.4	0.8
Delay (s)		21.1	20.1	46.9	9.9					49.1	49.1	34.5
Level of Service		C	C	D	A					D	D	C
Approach Delay (s)		20.9			13.0			0.0			46.0	
Approach LOS		C			B			A			D	

Intersection Summary			
HCM Average Control Delay	22.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱	↰↰	↑↑↑	↱	↰↰	↑	↱			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor		0.91	1.00	0.97	0.91	1.00	0.97	1.00	1.00			
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)		5085	1583	3433	5085	1583	3433	1863	1583			
Flt Permitted		1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)		5085	1583	3433	5085	1583	3433	1863	1583			
Volume (vph)	0	1610	300	70	1660	720	280	10	250	0	0	0
Peak-hour factor, PHF	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. Flow (vph)	0	1610	300	70	1660	720	280	10	250	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1610	300	70	1660	720	280	10	250	0	0	0
Turn Type			Perm	Prot		Perm	Perm		Perm			
Protected Phases		2		1	6			8				
Permitted Phases			2			6	8		8			
Actuated Green, G (s)		70.4	70.4	5.6	80.0	80.0	22.0	22.0	22.0			
Effective Green, g (s)		70.4	70.4	5.6	80.0	80.0	22.0	22.0	22.0			
Actuated g/C Ratio		0.64	0.64	0.05	0.73	0.73	0.20	0.20	0.20			
Clearance Time (s)		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)		3254	1013	175	3698	1151	687	373	317			
v/s Ratio Prot		0.32		0.02	0.33			0.01				
v/s Ratio Perm			0.19			c0.45	0.08		c0.16			
v/c Ratio		0.49	0.30	0.40	0.45	0.63	0.41	0.03	0.79			
Uniform Delay, d1		10.4	8.8	50.6	6.1	7.5	38.3	35.4	41.8			
Progression Factor		0.22	0.25	1.04	0.68	0.98	1.00	1.00	1.00			
Incremental Delay, d2		0.5	0.6	0.9	0.2	1.5	0.4	0.0	12.2			
Delay (s)		2.7	2.8	53.7	4.3	8.8	38.7	35.4	54.0			
Level of Service		A	A	D	A	A	D	D	D			
Approach Delay (s)		2.8			7.1			45.7			0.0	
Approach LOS		A			A			D			A	

Intersection Summary			
HCM Average Control Delay	9.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	54.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		0.97	0.95		0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	5063		3433	3509		3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	5063		3433	3509		3433	3539	1583
Volume (vph)	460	1140	240	70	1700	50	500	500	30	10	150	280
Peak-hour factor, PHF	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. Flow (vph)	460	1140	240	70	1700	50	500	500	30	10	150	280
RTOR Reduction (vph)	0	0	79	0	2	0	0	4	0	0	0	167
Lane Group Flow (vph)	460	1140	161	70	1748	0	500	526	0	10	150	113
Turn Type	Prot		pm+ov	Prot			Prot			Prot		Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2									4
Actuated Green, G (s)	16.8	55.0	74.0	4.8	43.0		19.0	33.4		0.8	15.2	15.2
Effective Green, g (s)	16.8	55.0	74.0	4.8	43.0		19.0	33.4		0.8	15.2	15.2
Actuated g/C Ratio	0.15	0.50	0.67	0.04	0.39		0.17	0.30		0.01	0.14	0.14
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	524	2543	1065	77	1979		593	1065		25	489	219
v/s Ratio Prot	c0.13	0.22	0.03	0.04	c0.35		c0.15	c0.15		0.00	0.04	
v/s Ratio Perm			0.08									0.07
v/c Ratio	0.88	0.45	0.15	0.91	0.88		0.84	0.49		0.40	0.31	0.52
Uniform Delay, d1	45.6	17.7	6.6	52.4	31.2		44.1	31.4		54.4	42.7	44.0
Progression Factor	1.26	1.43	3.65	1.22	1.46		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	13.7	0.5	0.1	62.1	5.0		10.6	0.4		10.2	0.4	2.0
Delay (s)	71.3	25.9	24.0	125.9	50.5		54.6	31.7		64.5	43.0	46.0
Level of Service	E	C	C	F	D		D	C		E	D	D
Approach Delay (s)		37.0			53.4			42.8			45.4	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	44.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	1.00	1.00	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	3433	1863	1583	3433	3260	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	3433	1863	1583	3433	3260	
Volume (vph)	220	710	260	30	1210	340	510	200	20	90	90	100
Peak-hour factor, PHF	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. Flow (vph)	220	710	260	30	1210	340	510	200	20	90	90	100
RTOR Reduction (vph)	0	0	121	0	0	158	0	0	16	0	92	0
Lane Group Flow (vph)	220	710	139	30	1210	182	510	200	4	90	98	0
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	22.5	59.0	59.0	4.3	40.8	40.8	22.2	19.4	19.4	11.3	8.5	
Effective Green, g (s)	22.5	59.0	59.0	4.3	40.8	40.8	22.2	19.4	19.4	11.3	8.5	
Actuated g/C Ratio	0.20	0.54	0.54	0.04	0.37	0.37	0.20	0.18	0.18	0.10	0.08	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	362	2727	849	69	1886	587	693	329	279	353	252	
v/s Ratio Prot	c0.12	0.14		0.02	c0.24		c0.15	c0.11		0.03	0.03	
v/s Ratio Perm			0.09			0.12			0.00			
v/c Ratio	0.61	0.26	0.16	0.43	0.64	0.31	0.74	0.61	0.01	0.25	0.39	
Uniform Delay, d1	39.7	13.7	13.0	51.7	28.6	24.6	41.2	41.8	37.4	45.5	48.3	
Progression Factor	1.36	1.52	6.92	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.7	0.2	0.4	4.3	1.7	1.4	4.1	3.2	0.0	0.4	1.0	
Delay (s)	56.9	21.1	90.1	56.0	30.3	26.0	45.2	45.0	37.4	45.9	49.3	
Level of Service	E	C	F	E	C	C	D	D	D	D	D	
Approach Delay (s)		42.8			29.8			44.9			48.2	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM Average Control Delay	38.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		0.97	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.97		1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	4947		1770	4927		3433	3381		1770	3429	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	4947		1770	4927		3433	3381		1770	3429	
Volume (vph)	110	720	160	200	1380	360	450	520	220	340	380	100
Peak-hour factor, PHF	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. Flow (vph)	110	720	160	200	1380	360	450	520	220	340	380	100
RTOR Reduction (vph)	0	32	0	0	42	0	0	43	0	0	21	0
Lane Group Flow (vph)	110	848	0	200	1698	0	450	697	0	340	459	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	7.0	33.4		15.1	41.5		18.5	23.0		22.5	27.0	
Effective Green, g (s)	7.0	33.4		15.1	41.5		18.5	23.0		22.5	27.0	
Actuated g/C Ratio	0.06	0.30		0.14	0.38		0.17	0.21		0.20	0.25	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	113	1502		243	1859		577	707		362	842	
v/s Ratio Prot	0.06	0.17		c0.11	c0.34		0.13	c0.21		c0.19	c0.13	
v/s Ratio Perm												
v/c Ratio	0.97	0.56		0.82	0.91		0.78	0.99		0.94	0.54	
Uniform Delay, d1	51.4	32.2		46.2	32.5		43.8	43.3		43.1	36.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	75.7	1.5		19.7	8.4		6.6	30.1		31.6	0.7	
Delay (s)	127.2	33.7		65.8	40.9		50.4	73.5		74.7	36.9	
Level of Service	F	C		E	D		D	E		E	D	
Approach Delay (s)		44.1			43.5			64.8			52.6	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM Average Control Delay	50.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	94.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	0.95		0.91	0.91	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (prot)	1770	5058		1770	5085	1583	1770	3256		1610	3256	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (perm)	1770	5058		1770	5085	1583	1770	3256		1610	3256	1583
Volume (vph)	290	810	30	40	1310	400	80	70	80	380	40	470
Peak-hour factor, PHF	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. Flow (vph)	290	810	30	40	1310	400	80	70	80	380	40	470
RTOR Reduction (vph)	0	2	0	0	0	203	0	73	0	0	0	390
Lane Group Flow (vph)	290	838	0	40	1310	197	80	77	0	190	230	80
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases						6						4
Actuated Green, G (s)	14.0	67.6		5.6	59.2	59.2	10.3	10.3		20.5	20.5	20.5
Effective Green, g (s)	14.0	67.6		5.6	59.2	59.2	10.3	10.3		20.5	20.5	20.5
Actuated g/C Ratio	0.12	0.56		0.05	0.49	0.49	0.09	0.09		0.17	0.17	0.17
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	207	2849		83	2509	781	152	279		275	556	270
v/s Ratio Prot	c0.16	0.17		0.02	c0.26		c0.05	0.02		c0.12	0.07	
v/s Ratio Perm						0.12						0.05
v/c Ratio	1.40	0.29		0.48	0.52	0.25	0.53	0.28		0.69	0.41	0.30
Uniform Delay, d1	53.0	13.7		55.8	20.7	17.6	52.5	51.4		46.8	44.4	43.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	206.9	0.3		4.4	0.8	0.8	3.3	0.5		7.3	0.5	0.6
Delay (s)	259.9	14.0		60.1	21.5	18.4	55.8	51.9		54.1	44.9	44.1
Level of Service	F	B		E	C	B	E	D		D	D	D
Approach Delay (s)		77.1			21.7			53.2			46.4	
Approach LOS		E			C			D			D	

Intersection Summary			
HCM Average Control Delay	44.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1863	1583	1770	1653	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.70	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	1313	1863	1583	1386	1653	
Volume (vph)	110	910	220	170	1370	140	300	20	130	70	20	60
Peak-hour factor, PHF	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. Flow (vph)	110	910	220	170	1370	140	300	20	130	70	20	60
RTOR Reduction (vph)	0	0	104	0	0	64	0	0	99	0	46	0
Lane Group Flow (vph)	110	910	116	170	1370	76	300	20	31	70	34	0
Turn Type	Prot		Perm	Prot		Perm	Perm		Perm	Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4			8	2		2	6		
Actuated Green, G (s)	11.9	57.8	57.8	14.2	60.1	60.1	26.0	26.0	26.0	26.0	26.0	
Effective Green, g (s)	11.9	57.8	57.8	14.2	60.1	60.1	26.0	26.0	26.0	26.0	26.0	
Actuated g/C Ratio	0.11	0.53	0.53	0.13	0.55	0.55	0.24	0.24	0.24	0.24	0.24	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	191	2672	832	228	2778	865	310	440	374	328	391	
v/s Ratio Prot	0.06	0.18		c0.10	c0.27			0.01			0.02	
v/s Ratio Perm			0.07			0.05	c0.23		0.02	0.05		
v/c Ratio	0.58	0.34	0.14	0.75	0.49	0.09	0.97	0.05	0.08	0.21	0.09	
Uniform Delay, d1	46.7	15.1	13.4	46.2	15.5	11.9	41.6	32.4	32.7	33.8	32.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.2	0.3	0.3	12.4	0.6	0.2	41.9	0.0	0.1	0.3	0.1	
Delay (s)	50.8	15.4	13.7	58.6	16.1	12.1	83.5	32.5	32.8	34.1	32.8	
Level of Service	D	B	B	E	B	B	F	C	C	C	C	
Approach Delay (s)		18.3			20.1			66.6			33.4	
Approach LOS		B			C			E			C	

Intersection Summary			
HCM Average Control Delay	26.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.92		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1723		1770	3447		1770	3519	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1723		1770	3447		1770	3519	
Volume (vph)	70	40	50	110	60	60	100	710	150	80	740	30
Peak-hour factor, PHF	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. Flow (vph)	70	40	50	110	60	60	100	710	150	80	740	30
RTOR Reduction (vph)	0	0	46	0	50	0	0	16	0	0	3	0
Lane Group Flow (vph)	70	40	4	110	70	0	100	844	0	80	767	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	5.6	5.8	5.8	8.1	8.3		7.9	42.9		5.4	40.4	
Effective Green, g (s)	5.6	5.8	5.8	8.1	8.3		7.9	42.9		5.4	40.4	
Actuated g/C Ratio	0.07	0.07	0.07	0.10	0.11		0.10	0.55		0.07	0.52	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	127	138	117	183	183		179	1891		122	1818	
v/s Ratio Prot	0.04	0.02		c0.06	c0.04		c0.06	c0.24		0.05	0.22	
v/s Ratio Perm			0.00									
v/c Ratio	0.55	0.29	0.03	0.60	0.38		0.56	0.45		0.66	0.42	
Uniform Delay, d1	35.1	34.3	33.6	33.5	32.6		33.5	10.6		35.5	11.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.1	1.2	0.1	5.5	1.3		3.7	0.8		12.0	0.7	
Delay (s)	40.2	35.4	33.7	39.0	33.9		37.2	11.3		47.5	12.4	
Level of Service	D	D	C	D	C		D	B		D	B	
Approach Delay (s)		37.0			36.3			14.0			15.7	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM Average Control Delay	18.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	78.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	1234	5	10	916	20	12	0	32	40	0	20
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	1234	5	10	916	20	12	0	32	40	0	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		988			1304							
pX, platoon unblocked	0.96			0.79			0.81	0.81	0.79	0.81	0.81	0.96
vC, conflicting volume	936			1239			1754	2212	620	1615	2205	468
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	895			1041			1560	2124	261	1388	2114	409
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			79	100	95	48	100	96
cM capacity (veh/h)	726			527			58	39	586	76	39	570

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2
Volume Total	10	823	416	10	611	325	12	32	40	20
Volume Left	10	0	0	10	0	0	12	0	40	0
Volume Right	0	0	5	0	0	20	0	32	0	20
cSH	726	1700	1700	527	1700	1700	58	586	76	570
Volume to Capacity	0.01	0.48	0.24	0.02	0.36	0.19	0.21	0.05	0.52	0.04
Queue Length 95th (ft)	1	0	0	1	0	0	17	4	55	3
Control Delay (s)	10.0	0.0	0.0	12.0	0.0	0.0	82.4	11.5	95.1	11.5
Lane LOS	B			B			F	B	F	B
Approach Delay (s)	0.1			0.1			30.8		67.3	
Approach LOS							D		F	

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	49.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.92		1.00	1.00	0.85	1.00	0.96		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1709		1770	1863	1583	1770	3388		1770	3474	
Flt Permitted	0.67	1.00		0.51	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1250	1709		945	1863	1583	1770	3388		1770	3474	
Volume (vph)	170	90	110	260	100	210	90	900	360	320	860	120
Peak-hour factor, PHF	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. Flow (vph)	170	90	110	260	100	210	90	900	360	320	860	120
RTOR Reduction (vph)	0	38	0	0	0	150	0	34	0	0	8	0
Lane Group Flow (vph)	170	162	0	260	100	60	90	1226	0	320	972	0
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	34.1	34.1		34.1	34.1	34.1	10.4	50.6		23.3	63.5	
Effective Green, g (s)	34.1	34.1		34.1	34.1	34.1	10.4	50.6		23.3	63.5	
Actuated g/C Ratio	0.28	0.28		0.28	0.28	0.28	0.09	0.42		0.19	0.53	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	355	486		269	529	450	153	1429		344	1838	
v/s Ratio Prot		0.09			0.05		0.05	c0.36		c0.18	0.28	
v/s Ratio Perm	0.14			c0.28		0.04						
v/c Ratio	0.48	0.33		0.97	0.19	0.13	0.59	0.86		0.93	0.53	
Uniform Delay, d1	35.6	34.0		42.4	32.5	31.9	52.7	31.4		47.6	18.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	0.4		45.2	0.2	0.1	5.7	6.9		31.1	1.1	
Delay (s)	36.6	34.4		87.6	32.7	32.1	58.4	38.3		78.7	19.6	
Level of Service	D	C		F	C	C	E	D		E	B	
Approach Delay (s)		35.4			57.5			39.6			34.1	
Approach LOS		D			E			D			C	

Intersection Summary			
HCM Average Control Delay	40.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	93.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3432		1770	3539	1770	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3432		1770	3539	1770	1583
Volume (vph)	590	150	490	850	40	320
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	590	150	490	850	40	320
RTOR Reduction (vph)	21	0	0	0	0	259
Lane Group Flow (vph)	719	0	490	850	40	61
Turn Type			Prot			Perm
Protected Phases	4		3	8	2	
Permitted Phases						2
Actuated Green, G (s)	33.2		35.8	73.0	19.0	19.0
Effective Green, g (s)	33.2		35.8	73.0	19.0	19.0
Actuated g/C Ratio	0.33		0.36	0.73	0.19	0.19
Clearance Time (s)	4.0		4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1139		634	2583	336	301
v/s Ratio Prot	c0.21		c0.28	0.24	0.02	
v/s Ratio Perm						c0.04
v/c Ratio	0.63		0.77	0.33	0.12	0.20
Uniform Delay, d1	28.2		28.5	4.8	33.6	34.1
Progression Factor	1.00		0.64	0.39	1.00	1.00
Incremental Delay, d2	2.7		5.0	0.3	0.7	1.5
Delay (s)	30.9		23.3	2.1	34.3	35.6
Level of Service	C		C	A	C	D
Approach Delay (s)	30.9			9.9	35.5	
Approach LOS	C			A	D	

Intersection Summary			
HCM Average Control Delay	20.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.86		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3461		1770	3497		1770	1599		1770	1676	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3461		1770	3497		1770	1599		1770	1676	
Volume (vph)	60	690	120	310	1170	100	90	10	170	50	20	40
Peak-hour factor, PHF	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. Flow (vph)	60	690	120	310	1170	100	90	10	170	50	20	40
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	0	0	35	0
Lane Group Flow (vph)	60	810	0	310	1265	0	90	180	0	50	25	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	7.1	36.7		26.8	56.4		7.7	15.7		4.8	12.8	
Effective Green, g (s)	7.1	36.7		26.8	56.4		7.7	15.7		4.8	12.8	
Actuated g/C Ratio	0.07	0.37		0.27	0.56		0.08	0.16		0.05	0.13	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	126	1270		474	1972		136	251		85	215	
v/s Ratio Prot	0.03	c0.23		0.18	c0.36		c0.05	c0.11		0.03	0.01	
v/s Ratio Perm												
v/c Ratio	0.48	0.64		0.65	0.64		0.66	0.72		0.59	0.12	
Uniform Delay, d1	44.7	26.2		32.5	14.9		44.9	40.0		46.6	38.6	
Progression Factor	0.91	1.45		1.01	0.96		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.3	2.0		2.6	1.3		11.5	9.4		10.0	0.2	
Delay (s)	43.0	39.9		35.5	15.5		56.3	49.4		56.6	38.8	
Level of Service	D	D		D	B		E	D		E	D	
Approach Delay (s)		40.1			19.4			51.7			46.9	
Approach LOS		D			B			D			D	

Intersection Summary			
HCM Average Control Delay	29.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0					4.0	4.0	4.0
Lane Util. Factor		0.95			0.95					0.95	0.95	1.00
Frt		0.99			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	0.95	1.00
Satd. Flow (prot)		3516			3539					1681	1681	1583
Flt Permitted		1.00			1.00					0.95	0.95	1.00
Satd. Flow (perm)		3516			3539					1681	1681	1583
Volume (vph)	0	870	40	0	990	0	0	0	0	720	0	590
Peak-hour factor, PHF	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. Flow (vph)	0	870	40	0	990	0	0	0	0	720	0	590
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	910	0	0	990	0	0	0	0	360	360	590
Turn Type										Perm		custom
Protected Phases		2			6						4	4
Permitted Phases										4		4
Actuated Green, G (s)		49.5			49.5					42.5	42.5	42.5
Effective Green, g (s)		49.5			49.5					42.5	42.5	42.5
Actuated g/C Ratio		0.50			0.50					0.42	0.42	0.42
Clearance Time (s)		4.0			4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1740			1752					714	714	673
v/s Ratio Prot		0.26			c0.28							c0.37
v/s Ratio Perm										0.21	0.21	
v/c Ratio		0.52			0.57					0.50	0.50	0.88
Uniform Delay, d1		17.2			17.7					21.0	21.0	26.3
Progression Factor		0.14			0.34					1.00	1.00	1.00
Incremental Delay, d2		0.9			1.2					0.6	0.6	12.3
Delay (s)		3.2			7.3					21.6	21.6	38.7
Level of Service		A			A					C	C	D
Approach Delay (s)		3.2			7.3			0.0			29.3	
Approach LOS		A			A			A			C	

Intersection Summary			
HCM Average Control Delay	15.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	102.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	0.95			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	1770	3539			3539	1583		1770	1583			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	1770	3539			3539	1583		1770	1583			
Volume (vph)	220	1370	0	0	1010	730	90	0	210	0	0	0
Peak-hour factor, PHF	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. Flow (vph)	220	1370	0	0	1010	730	90	0	210	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	220	1370	0	0	1010	730	0	90	210	0	0	0
Turn Type	Prot					Perm	Perm		custom			
Protected Phases	5	2			6			8	8			
Permitted Phases						6	8		8			
Actuated Green, G (s)	16.0	76.1			56.1	56.1		15.9	15.9			
Effective Green, g (s)	16.0	76.1			56.1	56.1		15.9	15.9			
Actuated g/C Ratio	0.16	0.76			0.56	0.56		0.16	0.16			
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)	283	2693			1985	888		281	252			
v/s Ratio Prot	c0.12	0.39			0.29				c0.13			
v/s Ratio Perm						c0.46		0.05				
v/c Ratio	0.78	0.51			0.51	0.82		0.32	0.83			
Uniform Delay, d1	40.3	4.7			13.5	17.9		37.3	40.8			
Progression Factor	0.92	0.87			0.12	0.18		1.00	1.00			
Incremental Delay, d2	11.4	0.6			0.6	5.7		0.7	20.4			
Delay (s)	48.5	4.7			2.2	8.9		37.9	61.2			
Level of Service	D	A			A	A		D	E			
Approach Delay (s)		10.7			5.0			54.2			0.0	
Approach LOS		B			A			D			A	

Intersection Summary			
HCM Average Control Delay	11.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.92		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	1770	4950		3433	3264		1770	3427	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	1770	4950		3433	3264		1770	3427	
Volume (vph)	100	1190	290	260	1020	220	610	270	290	230	410	110
Peak-hour factor, PHF	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. Flow (vph)	100	1190	290	260	1020	220	610	270	290	230	410	110
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	100	1190	290	260	1240	0	610	560	0	230	520	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	9.6	29.4	29.4	16.8	36.6		20.3	22.5		15.3	17.5	
Effective Green, g (s)	9.6	29.4	29.4	16.8	36.6		20.3	22.5		15.3	17.5	
Actuated g/C Ratio	0.10	0.29	0.29	0.17	0.37		0.20	0.22		0.15	0.18	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	170	1495	465	297	1812		697	734		271	600	
v/s Ratio Prot	0.06	c0.23		c0.15	0.25		c0.18	0.17		0.13	c0.15	
v/s Ratio Perm			0.18									
v/c Ratio	0.59	0.80	0.62	0.88	0.68		0.88	0.76		0.85	0.87	
Uniform Delay, d1	43.3	32.5	30.5	40.6	26.8		38.6	36.3		41.2	40.1	
Progression Factor	0.90	0.90	0.88	0.72	0.35		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.4	3.8	5.3	20.4	1.8		11.8	4.7		21.2	12.5	
Delay (s)	43.4	33.0	32.1	49.6	11.0		50.5	41.0		62.4	52.6	
Level of Service	D	C	C	D	B		D	D		E	D	
Approach Delay (s)		33.5			17.7			45.9			55.6	
Approach LOS		C			B			D			E	

Intersection Summary			
HCM Average Control Delay	35.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.91	0.91		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	5085	5055		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	5085	5055		1770	1583
Volume (vph)	340	1370	1210	50	130	290
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	340	1370	1210	50	130	290
RTOR Reduction (vph)	0	0	5	0	0	175
Lane Group Flow (vph)	340	1370	1255	0	130	115
Turn Type	Prot					Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	15.3	52.3	33.0		39.7	39.7
Effective Green, g (s)	15.3	52.3	33.0		39.7	39.7
Actuated g/C Ratio	0.15	0.52	0.33		0.40	0.40
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	525	2659	1668		703	628
v/s Ratio Prot	c0.10	0.27	c0.25		c0.07	
v/s Ratio Perm						0.07
v/c Ratio	0.65	0.52	0.75		0.18	0.18
Uniform Delay, d1	39.8	15.6	29.9		19.6	19.6
Progression Factor	1.22	1.05	0.86		1.00	1.00
Incremental Delay, d2	1.6	0.1	1.7		0.6	0.6
Delay (s)	50.0	16.4	27.2		20.2	20.2
Level of Service	D	B	C		C	C
Approach Delay (s)		23.1	27.2		20.2	
Approach LOS		C	C		C	

Intersection Summary			
HCM Average Control Delay	24.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	1770	3463		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	3539	1583	1770	3463		1770	3539	1583
Volume (vph)	430	910	160	50	720	50	110	360	60	60	300	430
Peak-hour factor, PHF	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. Flow (vph)	430	910	160	50	720	50	110	360	60	60	300	430
RTOR Reduction (vph)	0	0	78	0	0	30	0	14	0	0	0	303
Lane Group Flow (vph)	430	910	82	50	720	20	110	406	0	60	300	127
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	16.9	51.2	51.2	6.3	40.6	40.6	9.9	19.7		6.8	16.6	16.6
Effective Green, g (s)	16.9	51.2	51.2	6.3	40.6	40.6	9.9	19.7		6.8	16.6	16.6
Actuated g/C Ratio	0.17	0.51	0.51	0.06	0.41	0.41	0.10	0.20		0.07	0.17	0.17
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	580	1812	810	112	1437	643	175	682		120	587	263
v/s Ratio Prot	c0.13	c0.26		0.03	0.20		c0.06	c0.12		0.03	0.08	
v/s Ratio Perm			0.05			0.01						0.08
v/c Ratio	0.74	0.50	0.10	0.45	0.50	0.03	0.63	0.59		0.50	0.51	0.48
Uniform Delay, d1	39.5	16.0	12.6	45.2	22.1	17.9	43.3	36.5		45.0	38.0	37.8
Progression Factor	0.69	1.33	2.57	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.8	0.9	0.2	2.8	1.3	0.1	6.9	1.4		3.3	0.8	1.4
Delay (s)	31.9	22.3	32.5	48.0	23.4	18.0	50.2	37.9		48.2	38.8	39.2
Level of Service	C	C	C	D	C	B	D	D		D	D	D
Approach Delay (s)		26.1			24.6			40.5			39.7	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	30.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.91	0.91	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.86	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	1770	2933	1441	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	1770	2933	1441	1770	1863	1583
Volume (vph)	130	1710	60	530	1090	500	220	20	360	250	20	120
Peak-hour factor, PHF	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. Flow (vph)	130	1710	60	530	1090	500	220	20	360	250	20	120
RTOR Reduction (vph)	0	0	32	0	0	224	0	167	167	0	0	110
Lane Group Flow (vph)	130	1710	28	530	1090	276	220	33	13	250	20	10
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	8.0	46.6	46.6	22.1	60.7	60.7	16.2	7.9	7.9	17.4	9.1	9.1
Effective Green, g (s)	8.0	46.6	46.6	22.1	60.7	60.7	16.2	7.9	7.9	17.4	9.1	9.1
Actuated g/C Ratio	0.07	0.42	0.42	0.20	0.55	0.55	0.15	0.07	0.07	0.16	0.08	0.08
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	250	2154	671	690	2806	874	261	211	103	280	154	131
v/s Ratio Prot	0.04	c0.34		c0.15	0.21		0.12	c0.01		c0.14	0.01	
v/s Ratio Perm			0.02			0.17			0.01			0.01
v/c Ratio	0.52	0.79	0.04	0.77	0.39	0.32	0.84	0.16	0.13	0.89	0.13	0.08
Uniform Delay, d1	49.1	27.5	18.6	41.5	14.1	13.4	45.7	47.9	47.8	45.4	46.8	46.6
Progression Factor	1.00	1.00	1.00	0.68	1.06	5.44	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	3.1	0.1	4.3	0.3	0.8	21.2	0.3	0.6	27.9	0.4	0.2
Delay (s)	51.1	30.6	18.7	32.6	15.2	73.6	66.8	48.3	48.4	73.3	47.2	46.8
Level of Service	D	C	B	C	B	E	E	D	D	E	D	D
Approach Delay (s)		31.7			33.3			55.1			63.8	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM Average Control Delay	37.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.91	1.00	0.97	0.91					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		5085	1583	3433	5085					1681	1681	1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		5085	1583	3433	5085					1681	1681	1583
Volume (vph)	0	2060	380	380	1880	0	0	0	0	860	0	240
Peak-hour factor, PHF	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. Flow (vph)	0	2060	380	380	1880	0	0	0	0	860	0	240
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2060	380	380	1880	0	0	0	0	430	430	240
Turn Type			Perm	Prot						Split		Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		51.9	51.9	15.0	70.9					31.1	31.1	31.1
Effective Green, g (s)		51.9	51.9	15.0	70.9					31.1	31.1	31.1
Actuated g/C Ratio		0.47	0.47	0.14	0.64					0.28	0.28	0.28
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2399	747	468	3278					475	475	448
v/s Ratio Prot		c0.41		c0.11	0.37					c0.26	0.26	
v/s Ratio Perm			0.24									0.15
v/c Ratio		0.86	0.51	0.81	0.57					0.91	0.91	0.54
Uniform Delay, d1		25.8	20.2	46.1	11.0					38.0	38.0	33.3
Progression Factor		0.65	0.51	0.95	0.71					1.00	1.00	1.00
Incremental Delay, d2		3.0	1.7	9.1	0.6					20.5	20.5	1.2
Delay (s)		19.7	12.1	52.9	8.5					58.6	58.6	34.6
Level of Service		B	B	D	A					E	E	C
Approach Delay (s)		18.5			15.9			0.0			53.3	
Approach LOS		B			B			A			D	

Intersection Summary			
HCM Average Control Delay	24.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor		0.91	1.00	0.97	0.91	1.00	0.97	1.00	1.00			
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85			
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)		5085	1583	3433	5085	1583	3433	1863	1583			
Flt Permitted		1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)		5085	1583	3433	5085	1583	3433	1863	1583			
Volume (vph)	0	2640	280	60	1710	730	550	50	340	0	0	0
Peak-hour factor, PHF	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. Flow (vph)	0	2640	280	60	1710	730	550	50	340	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2640	280	60	1710	730	550	50	340	0	0	0
Turn Type			Perm	Prot		Perm	Perm		Perm			
Protected Phases		2		1	6			8				
Permitted Phases			2			6	8		8			
Actuated Green, G (s)		67.7	67.7	3.2	74.9	74.9	27.1	27.1	27.1			
Effective Green, g (s)		67.7	67.7	3.2	74.9	74.9	27.1	27.1	27.1			
Actuated g/C Ratio		0.62	0.62	0.03	0.68	0.68	0.25	0.25	0.25			
Clearance Time (s)		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)		3130	974	100	3462	1078	846	459	390			
v/s Ratio Prot		c0.52		0.02	0.34			0.03				
v/s Ratio Perm			0.18			c0.46	0.16		c0.21			
v/c Ratio		0.84	0.29	0.60	0.49	0.68	0.65	0.11	0.87			
Uniform Delay, d1		16.9	9.9	52.8	8.4	10.4	37.2	32.1	39.8			
Progression Factor		0.29	0.27	1.12	1.78	1.64	1.00	1.00	1.00			
Incremental Delay, d2		1.5	0.4	3.8	0.2	1.3	1.8	0.1	18.8			
Delay (s)		6.4	3.0	63.1	15.2	18.4	39.0	32.2	58.5			
Level of Service		A	A	E	B	B	D	C	E			
Approach Delay (s)		6.1			17.3			45.7			0.0	
Approach LOS		A			B			D			A	

Intersection Summary			
HCM Average Control Delay	16.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	78.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		0.97	0.95		0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	1770	5056		3433	3445		3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	1770	5056		3433	3445		3433	3539	1583
Volume (vph)	470	1990	530	50	1510	60	400	370	80	80	550	570
Peak-hour factor, PHF	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. Flow (vph)	470	1990	530	50	1510	60	400	370	80	80	550	570
RTOR Reduction (vph)	0	0	57	0	4	0	0	16	0	0	0	264
Lane Group Flow (vph)	470	1990	473	50	1566	0	400	434	0	80	550	306
Turn Type	Prot		pm+ov	Prot			Prot			Prot		Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2									4
Actuated Green, G (s)	22.8	53.0	67.3	6.2	36.4		14.3	30.6		4.2	20.5	20.5
Effective Green, g (s)	22.8	53.0	67.3	6.2	36.4		14.3	30.6		4.2	20.5	20.5
Actuated g/C Ratio	0.21	0.48	0.61	0.06	0.33		0.13	0.28		0.04	0.19	0.19
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	712	2450	969	100	1673		446	958		131	660	295
v/s Ratio Prot	c0.14	c0.39	0.06	0.03	c0.31		c0.12	0.13		0.02	0.16	
v/s Ratio Perm			0.24									c0.19
v/c Ratio	0.66	0.81	0.49	0.50	0.94		0.90	0.45		0.61	0.83	1.04
Uniform Delay, d1	40.0	24.3	11.8	50.4	35.7		47.1	32.8		52.1	43.1	44.8
Progression Factor	0.75	0.42	0.33	0.79	1.23		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.2	1.7	0.2	3.4	10.1		20.2	0.3		8.2	8.9	62.8
Delay (s)	31.4	11.8	4.1	43.1	54.1		67.3	33.1		60.3	52.0	107.5
Level of Service	C	B	A	D	D		E	C		E	D	F
Approach Delay (s)		13.5			53.8			49.2			78.9	
Approach LOS		B			D			D			E	

Intersection Summary			
HCM Average Control Delay	39.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	1.00	1.00	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	3433	1863	1583	3433	3274	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	3433	1863	1583	3433	3274	
Volume (vph)	160	1390	600	20	960	160	440	120	40	310	220	220
Peak-hour factor, PHF	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. Flow (vph)	160	1390	600	20	960	160	440	120	40	310	220	220
RTOR Reduction (vph)	0	0	280	0	0	89	0	0	36	0	187	0
Lane Group Flow (vph)	160	1390	320	20	960	71	440	120	4	310	253	0
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	20.4	58.7	58.7	3.1	41.4	41.4	19.2	12.0	12.0	20.2	13.0	
Effective Green, g (s)	20.4	58.7	58.7	3.1	41.4	41.4	19.2	12.0	12.0	20.2	13.0	
Actuated g/C Ratio	0.19	0.53	0.53	0.03	0.38	0.38	0.17	0.11	0.11	0.18	0.12	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	328	2714	845	50	1914	596	599	203	173	630	387	
v/s Ratio Prot	0.09	c0.27		0.01	c0.19		c0.13	0.06		0.09	c0.08	
v/s Ratio Perm			0.20			0.04			0.00			
v/c Ratio	0.49	0.51	0.38	0.40	0.50	0.12	0.73	0.59	0.03	0.49	0.65	
Uniform Delay, d1	40.1	16.5	15.0	52.5	26.4	22.4	43.0	46.7	43.8	40.3	46.4	
Progression Factor	0.52	0.21	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.7	0.4	0.8	5.2	0.9	0.4	4.7	4.6	0.1	0.6	3.9	
Delay (s)	21.6	3.9	14.3	57.7	27.3	22.8	47.6	51.2	43.8	40.9	50.3	
Level of Service	C	A	B	E	C	C	D	D	D	D	D	
Approach Delay (s)		8.1			27.2			48.1			46.4	
Approach LOS		A			C			D			D	

Intersection Summary			
HCM Average Control Delay	24.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0		3.5	4.0		3.5	4.0		3.5	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		0.97	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.98		1.00	0.95		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5014		1770	5009		3433	3374		1770	3419	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5014		1770	5009		3433	3374		1770	3419	
Volume (vph)	320	1850	190	190	1440	160	260	400	180	310	510	150
Peak-hour factor, PHF	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. Flow (vph)	320	1850	190	190	1440	160	260	400	180	310	510	150
RTOR Reduction (vph)	0	11	0	0	12	0	0	47	0	0	25	0
Lane Group Flow (vph)	320	2029	0	190	1588	0	260	533	0	310	635	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	20.0	47.0		12.0	39.0		10.0	18.0		17.0	25.0	
Effective Green, g (s)	20.5	47.0		12.5	39.0		10.5	18.0		17.5	25.0	
Actuated g/C Ratio	0.19	0.43		0.11	0.35		0.10	0.16		0.16	0.23	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	330	2142		201	1776		328	552		282	777	
v/s Ratio Prot	c0.18	c0.40		0.11	0.32		0.08	c0.16		c0.18	0.19	
v/s Ratio Perm												
v/c Ratio	0.97	0.95		0.95	0.89		0.79	0.97		1.10	0.82	
Uniform Delay, d1	44.4	30.3		48.4	33.5		48.7	45.7		46.2	40.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	40.9	10.5		47.6	7.4		12.3	29.5		82.8	6.7	
Delay (s)	85.3	40.8		96.1	40.9		61.0	75.2		129.1	47.0	
Level of Service	F	D		F	D		E	E		F	D	
Approach Delay (s)		46.8			46.8			70.8			73.2	
Approach LOS		D			D			E			E	

Intersection Summary			
HCM Average Control Delay	54.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	97.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	0.95		0.91	0.91	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00
Satd. Flow (prot)	1770	5051		1770	5085	1583	1770	3294		1610	3274	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00
Satd. Flow (perm)	1770	5051		1770	5085	1583	1770	3294		1610	3274	1583
Volume (vph)	710	1680	80	100	1210	480	50	70	60	580	120	450
Peak-hour factor, PHF	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. Flow (vph)	710	1680	80	100	1210	480	50	70	60	580	120	450
RTOR Reduction (vph)	0	3	0	0	0	335	0	56	0	0	0	352
Lane Group Flow (vph)	710	1757	0	100	1210	145	50	74	0	290	410	98
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases						6						4
Actuated Green, G (s)	33.0	60.4		8.8	36.2	36.2	8.7	8.7		26.1	26.1	26.1
Effective Green, g (s)	33.0	60.4		8.8	36.2	36.2	8.7	8.7		26.1	26.1	26.1
Actuated g/C Ratio	0.28	0.50		0.07	0.30	0.30	0.07	0.07		0.22	0.22	0.22
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	487	2542		130	1534	478	128	239		350	712	344
v/s Ratio Prot	c0.40	0.35		0.06	c0.24		c0.03	0.02		c0.18	0.13	
v/s Ratio Perm						0.09						0.06
v/c Ratio	1.46	0.69		0.77	0.79	0.30	0.39	0.31		0.83	0.58	0.28
Uniform Delay, d1	43.5	22.7		54.6	38.4	32.2	53.1	52.8		44.8	42.0	39.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	217.2	1.6		23.5	4.2	1.6	2.0	0.7		14.8	1.1	0.5
Delay (s)	260.7	24.3		78.1	42.6	33.8	55.1	53.6		59.7	43.1	39.6
Level of Service	F	C		E	D	C	E	D		E	D	D
Approach Delay (s)		92.2			42.2			54.0			45.9	
Approach LOS		F			D			D			D	

Intersection Summary			
HCM Average Control Delay	65.5	HCM Level of Service	E
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	96.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1863	1583	1770	1637	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.53	1.00	1.00	0.72	1.00	
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	985	1863	1583	1349	1637	
Volume (vph)	190	1710	390	300	1240	90	320	50	220	70	40	170
Peak-hour factor, PHF	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. Flow (vph)	190	1710	390	300	1240	90	320	50	220	70	40	170
RTOR Reduction (vph)	0	0	179	0	0	53	0	0	147	0	113	0
Lane Group Flow (vph)	190	1710	211	300	1240	37	320	50	73	70	97	0
Turn Type	Prot		Perm	Prot		Perm	Perm		Perm	Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4			8	2		2	6		
Actuated Green, G (s)	16.1	41.5	41.5	19.9	45.3	45.3	36.6	36.6	36.6	36.6	36.6	
Effective Green, g (s)	16.1	41.5	41.5	19.9	45.3	45.3	36.6	36.6	36.6	36.6	36.6	
Actuated g/C Ratio	0.15	0.38	0.38	0.18	0.41	0.41	0.33	0.33	0.33	0.33	0.33	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	259	1918	597	320	2094	652	328	620	527	449	545	
v/s Ratio Prot	0.11	c0.34		c0.17	c0.24			0.03			0.06	
v/s Ratio Perm			0.13			0.02	c0.32		0.05	0.05		
v/c Ratio	0.73	0.89	0.35	0.94	0.59	0.06	0.98	0.08	0.14	0.16	0.18	
Uniform Delay, d1	44.9	32.1	24.6	44.4	25.2	19.5	36.3	25.2	25.7	25.8	26.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	10.3	6.8	1.6	33.9	1.2	0.2	42.7	0.1	0.1	0.2	0.2	
Delay (s)	55.2	38.9	26.2	78.4	26.4	19.7	79.0	25.2	25.8	26.0	26.2	
Level of Service	E	D	C	E	C	B	E	C	C	C	C	
Approach Delay (s)		38.1			35.6			54.6			26.1	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM Average Control Delay	38.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	93.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.90		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1683		1770	3506		1770	3497	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1683		1770	3506		1770	3497	
Volume (vph)	70	20	100	120	50	90	100	1060	70	110	920	80
Peak-hour factor, PHF	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. Flow (vph)	70	20	100	120	50	90	100	1060	70	110	920	80
RTOR Reduction (vph)	0	0	90	0	78	0	0	4	0	0	6	0
Lane Group Flow (vph)	70	20	10	120	62	0	100	1126	0	110	994	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	6.1	8.4	8.4	8.7	11.0		8.4	42.2		7.9	41.7	
Effective Green, g (s)	6.1	8.4	8.4	8.7	11.0		8.4	42.2		7.9	41.7	
Actuated g/C Ratio	0.07	0.10	0.10	0.10	0.13		0.10	0.51		0.09	0.50	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	130	188	160	185	223		179	1778		168	1753	
v/s Ratio Prot	0.04	0.01		c0.07	c0.04		0.06	c0.32		c0.06	0.28	
v/s Ratio Perm			0.01									
v/c Ratio	0.54	0.11	0.06	0.65	0.28		0.56	0.63		0.65	0.57	
Uniform Delay, d1	37.2	34.0	33.8	35.8	32.5		35.6	14.9		36.3	14.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.2	0.3	0.2	7.6	0.7		3.7	1.7		8.8	1.3	
Delay (s)	41.4	34.2	34.0	43.4	33.2		39.4	16.6		45.2	15.8	
Level of Service	D	C	C	D	C		D	B		D	B	
Approach Delay (s)		36.8			37.9			18.5			18.7	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM Average Control Delay	21.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	83.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	20	890	14	35	1322	50	8	0	21	25	0	20
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	20	890	14	35	1322	50	8	0	21	25	0	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		988			1304							
pX, platoon unblocked	0.78			0.91			0.83	0.83	0.91	0.83	0.83	0.78
vC, conflicting volume	1372			904			1688	2379	452	1923	2361	686
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1200			790			1286	2117	291	1569	2095	326
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			95			91	100	97	55	100	96
cM capacity (veh/h)	453			748			91	38	639	56	39	526

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2
Volume Total	20	593	311	35	881	491	8	21	25	20
Volume Left	20	0	0	35	0	0	8	0	25	0
Volume Right	0	0	14	0	0	50	0	21	0	20
cSH	453	1700	1700	748	1700	1700	91	639	56	526
Volume to Capacity	0.04	0.35	0.18	0.05	0.52	0.29	0.09	0.03	0.45	0.04
Queue Length 95th (ft)	3	0	0	4	0	0	7	3	42	3
Control Delay (s)	13.3	0.0	0.0	10.0	0.0	0.0	48.5	10.8	113.0	12.1
Lane LOS	B			B			E	B	F	B
Approach Delay (s)	0.3			0.2			21.2		68.1	
Approach LOS							C		F	

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1701		1770	1863	1583	1770	3417		1770	3436	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1701		1770	1863	1583	1770	3417		1770	3436	
Volume (vph)	140	80	110	350	120	250	90	970	290	290	910	220
Peak-hour factor, PHF	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. Flow (vph)	140	80	110	350	120	250	90	970	290	290	910	220
RTOR Reduction (vph)	0	46	0	0	0	200	0	21	0	0	15	0
Lane Group Flow (vph)	140	145	0	350	120	50	90	1239	0	290	1115	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	14.0	15.0		23.0	24.0	24.0	8.7	49.0		17.0	57.3	
Effective Green, g (s)	14.0	15.0		23.0	24.0	24.0	8.7	49.0		17.0	57.3	
Actuated g/C Ratio	0.12	0.12		0.19	0.20	0.20	0.07	0.41		0.14	0.48	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	207	213		339	373	317	128	1395		251	1641	
v/s Ratio Prot	0.08	c0.08		c0.20	0.06		0.05	c0.36		c0.16	0.32	
v/s Ratio Perm						0.03						
v/c Ratio	0.68	0.68		1.03	0.32	0.16	0.70	0.89		1.16	0.68	
Uniform Delay, d1	50.8	50.2		48.5	41.0	39.7	54.4	33.0		51.5	24.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.4	8.3		57.5	0.5	0.2	16.1	8.7		105.3	2.3	
Delay (s)	59.3	58.5		106.0	41.5	39.9	70.4	41.7		156.8	26.5	
Level of Service	E	E		F	D	D	E	D		F	C	
Approach Delay (s)		58.8			72.3			43.6			53.1	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM Average Control Delay	53.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	95.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Mitigation

FEHR & PEERS
TRANSPORTATION CONSULTANTS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		1.00	0.91	1.00	1.00	0.95		0.97	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	5058		1770	5085	1583	1770	3256		3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	5058		1770	5085	1583	1770	3256		3433	1863	1583
Volume (vph)	290	810	30	40	1310	400	80	70	80	380	40	470
Peak-hour factor, PHF	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. Flow (vph)	290	810	30	40	1310	400	80	70	80	380	40	470
RTOR Reduction (vph)	0	2	0	0	0	190	0	73	0	0	0	383
Lane Group Flow (vph)	290	838	0	40	1310	210	80	77	0	380	40	87
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases						6						4
Actuated Green, G (s)	11.0	68.4		5.6	63.0	63.0	10.3	10.3		19.7	19.7	19.7
Effective Green, g (s)	11.0	68.4		5.6	63.0	63.0	10.3	10.3		19.7	19.7	19.7
Actuated g/C Ratio	0.09	0.57		0.05	0.52	0.52	0.09	0.09		0.16	0.16	0.16
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	315	2883		83	2670	831	152	279		564	306	260
v/s Ratio Prot	c0.08	0.17		0.02	c0.26		c0.05	0.02		c0.11	0.02	
v/s Ratio Perm						0.13						0.06
v/c Ratio	0.92	0.29		0.48	0.49	0.25	0.53	0.28		0.67	0.13	0.34
Uniform Delay, d1	54.1	13.3		55.8	18.2	15.6	52.5	51.4		47.1	42.8	44.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	31.0	0.3		4.4	0.6	0.7	3.3	0.5		3.2	0.2	0.8
Delay (s)	85.0	13.6		60.1	18.9	16.3	55.8	51.9		50.3	43.0	45.1
Level of Service	F	B		E	B	B	E	D		D	D	D
Approach Delay (s)		31.9			19.2			53.2			47.2	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM Average Control Delay	31.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		1.00	0.91	1.00	1.00	0.95		0.97	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	5051		1770	5085	1583	1770	3294		3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	5051		1770	5085	1583	1770	3294		3433	1863	1583
Volume (vph)	710	1680	80	100	1210	480	50	70	60	580	120	450
Peak-hour factor, PHF	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. Flow (vph)	710	1680	80	100	1210	480	50	70	60	580	120	450
RTOR Reduction (vph)	0	3	0	0	0	267	0	56	0	0	0	353
Lane Group Flow (vph)	710	1757	0	100	1210	213	50	74	0	580	120	97
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6						4
Actuated Green, G (s)	23.0	69.3		7.0	53.3	53.3	6.3	8.7		19.0	21.4	21.4
Effective Green, g (s)	23.0	69.3		7.0	53.3	53.3	6.3	8.7		19.0	21.4	21.4
Actuated g/C Ratio	0.19	0.58		0.06	0.44	0.44	0.05	0.07		0.16	0.18	0.18
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	658	2917		103	2259	703	93	239		544	332	282
v/s Ratio Prot	c0.21	c0.35		0.06	0.24		0.03	0.02		c0.17	c0.06	
v/s Ratio Perm						0.13						0.06
v/c Ratio	1.08	0.60		0.97	0.54	0.30	0.54	0.31		1.07	0.36	0.34
Uniform Delay, d1	48.5	16.4		56.4	24.3	21.4	55.4	52.8		50.5	43.3	43.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	58.3	0.9		79.0	0.9	1.1	5.9	0.7		57.4	0.7	0.7
Delay (s)	106.8	17.4		135.4	25.2	22.5	61.3	53.6		107.9	44.0	43.9
Level of Service	F	B		F	C	C	E	D		F	D	D
Approach Delay (s)		43.1			30.7			55.7			76.2	
Approach LOS		D			C			E			E	

Intersection Summary			
HCM Average Control Delay	46.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX C:

CCTALOS Calculation worksheets

Fehr & Peers
Transportation Consultants

Existing

FEHR & PEERS
TRANSPORTATION CONSULTANTS

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                      Level Of Service Computation Report
                   CCTALOS Method (Base Volume Alternative)
*********************************************************************************
Intersection #8 Lone Tree Way/Canada Valley Road
*********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):         0.382
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         37              Level Of Service:                  A
*********************************************************************************
Street Name:          Canada Valley Road                  Lone Tree Way
Approach:       North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected         Protected         Protected         Protected
Rights:           Include           Include           Include           Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:       2  0  0  1  1    1  0  1  0  1    1  0  3  0  1    2  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 7:45 - 8:45 AM
Base Vol:      36   14    51   190   31    34    29  746    52   166 1005   168
Growth 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
Initial Bse:   36   14    51   190   31    34    29  746    52   166 1005   168
User 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
PHF Adj:     0.90 0.90  0.90  0.90 0.90  0.90  0.90 0.90  0.90  0.90 0.90  0.90
PHF Volume:    40   16    57   211   34    38    32  829    58   184 1117   187
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   40   16    57   211   34    38    32  829    58   184 1117   187
RTOR Reduct:    0    0    57     0    0    32     0    0    22     0    0   187
RTOR Vol:      40   16     0   211   34     6    32  829    36   184 1117     0
PCE 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
MLF 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
FinalVolume:   40   16     0   211   34     6    32  829    36   184 1117     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  0.91 1.00  0.91  1.00 1.00  1.00  1.00 1.00  1.00  0.91 1.00  1.00
Lanes:       2.00 1.00  1.00  1.00 1.00  1.00  1.00 3.00  1.00  2.00 3.00  1.00
Final Sat.:  3000 1650  1500  1650 1650  1650  1650 4950  1650  3000 4950  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.01  0.00  0.13 0.02  0.00  0.02 0.17  0.02  0.06 0.23  0.00
Crit Volume:        16         211               32                     372
Crit Moves:        ****        ****              ****                   ****
*********************************************************************************
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                      Level Of Service Computation Report
                   CCTALOS Method (Base Volume Alternative)
********************************************************************************
Intersection #9 Lone Tree Way/SB SR 4 Bypass Ramps
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.513
Loss Time (sec):        0 (Y+R=4.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         47               Level Of Service:                  A
********************************************************************************
Street Name:        SB SR 4 Bypass Ramps                  Lone Tree Way
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:        0  0  0  0  0    1  1  0  0  1    0  0  3  0  1    2  0  3  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 7:45 - 8:45 AM
Base Vol:       0     0     0  287     6   353     0   571   401    72 1000     0
Growth 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
Initial Bse:    0     0     0  287     6   353     0   571   401    72 1000     0
User 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
PHF Adj:     0.90  0.90  0.90 0.90  0.90  0.90  0.90  0.90  0.90  0.90 0.90  0.90
PHF Volume:     0     0     0  319     7   392     0   634   446    80 1111     0
Reduct Vol:     0     0     0    0     0     0     0     0     0     0    0     0
Reduced Vol:    0     0     0  319     7   392     0   634   446    80 1111     0
RTOR Reduct:    0     0     0    0     0     0     0     0     0     0    0     0
RTOR Vol:       0     0     0  319     7   392     0   634   446    80 1111     0
PCE 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
MLF 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
FinalVolume:    0     0     0  319     7   392     0   634   446    80 1111     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720  1720  1720 1720  1720  1720  1720  1720  1720  1720 1720  1720
Adjustment:  1.00  1.00  1.00 0.91  1.00  1.00  1.00  1.00  1.00  0.91 1.00  1.00
Lanes:       0.00  0.00  0.00 1.96  0.04  1.00  0.00  3.00  1.00  2.00 3.00  0.00
Final Sat.:     0     0     0 3063    70  1720     0  5160  1720  3127 5160     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.00  0.00 0.10  0.09  0.23  0.00  0.12  0.26  0.03 0.22  0.00
Crit Volume:    0                          392               446    40
Crit Moves:                               ****              ****  ****
********************************************************************************
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                      Level Of Service Computation Report
                   CCTALOS Method (Base Volume Alternative)
********************************************************************************
Intersection #10 Lone Tree Way/NB SR 4 Bypass Ramps
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.308
Loss Time (sec):        0 (Y+R=4.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         33               Level Of Service:                  A
********************************************************************************
Street Name:         NB SR 4 Bypass Ramps                Lone Tree Way
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Split Phase      Split Phase       Protected        Protected
Rights:            Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:         1  1  0  0  1   0  0  0  0  0   0  0  3  0  1   1  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 May 2008 << 7:30 - 8:30 AM
Base Vol:      383   29    79    0    0     0    0  662   160    8  671   245
Growth 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
Initial Bse:   383   29    79    0    0     0    0  662   160    8  671   245
User 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
PHF Adj:      0.89 0.89  0.89 0.89 0.89  0.89 0.89 0.89  0.89 0.89 0.89  0.89
PHF Volume:    430   33    89    0    0     0    0  744   180    9  754   275
Reduct Vol:      0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   430   33    89    0    0     0    0  744   180    9  754   275
RTOR Reduct:     0    0     9    0    0     0    0    0   180    0    0     0
RTOR Vol:      430   33    80    0    0     0    0  744     0    9  754   275
PCE 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
MLF 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
FinalVolume:   430   33    80    0    0     0    0  744     0    9  754   275
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:   0.91 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:        1.86 0.14  1.00 0.00 0.00  0.00 0.00 3.00  1.00 1.00 3.00  1.00
Final Sat.:   2907  242  1720    0    0     0    0 5160  1720 1720 5160  1720
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.15 0.13  0.05 0.00 0.00  0.00 0.00 0.14  0.00 0.01 0.15  0.16
Crit Volume:   231                    0             0                      275
Crit Moves:   ****                               ****                     ****
********************************************************************************
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                     Level Of Service Computation Report
                  CCTALOS Method (Base Volume Alternative)
********************************************************************************
Intersection #11 Lone Tree Way/Slatten Ranch Road
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.461
Loss Time (sec):       0 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        42                Level Of Service:                  A
********************************************************************************
Street Name:        Slatten Ranch Road                   Lone Tree Way
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        2  0  1  1  0   2  0  1  0  1   2  0  3  0  1   1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 22 May 2008 << 7:15 - 8:15 AM
Base Vol:      39   47   191    42   35    24    74  484    91    54  837    29
Growth 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
Initial Bse:   39   47   191    42   35    24    74  484    91    54  837    29
User 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
PHF Adj:     0.90 0.90  0.90  0.90 0.90  0.90  0.90 0.90  0.90  0.90 0.90  0.90
PHF Volume:    43   52   212    47   39    27    82  538   101    60  930    32
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   43   52   212    47   39    27    82  538   101    60  930    32
RTOR Reduct:    0    0     0     0    0    27     0    0    24     0    0    26
RTOR Vol:      43   52   212    47   39     0    82  538    77    60  930     7
PCE 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
MLF 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
FinalVolume:   43   52   212    47   39     0    82  538    77    60  930     7
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  0.91 1.00  1.00  0.91 1.00  1.00  0.91 1.00  1.00  1.00 1.00  1.00
Lanes:       2.00 1.00  1.00  2.00 1.00  1.00  2.00 3.00  1.00  1.00 2.00  1.00
Final Sat.:  3000 1650  1650  3000 1650  1650  3000 4950  1650  1650 3300  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.03  0.13  0.02 0.02  0.00  0.03 0.11  0.05  0.04 0.28  0.00
Crit Volume:             212         39          41                     465
Crit Moves:             ****       ****        ****                    ****
********************************************************************************
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Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #12 Lone Tree Way/Empire Avenue

Cycle (sec):	100	Critical Vol./Cap.(X):	0.483
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	44	Level Of Service:	A

Street Name:	Empire Avenue						Lone Tree Way					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2 0	1 0	1	2 0	1 1	0	1 0	3 0	1	1 0	2 0	1
Volume Module: >> Count Date: 22 May 2008 << 7:15 - 8:15 AM												
Base Vol:	89	48	41	105	77	181	168	499	26	81	638	80
Growth 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
Initial Bse:	89	48	41	105	77	181	168	499	26	81	638	80
User 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
PHF Adj:	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF Volume:	99	53	46	117	86	201	187	554	29	90	709	89
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	99	53	46	117	86	201	187	554	29	90	709	89
RTOR Reduct:	0	0	46	0	0	0	0	0	29	0	0	64
RTOR Vol:	99	53	0	117	86	201	187	554	0	90	709	25
PCE 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
MLF 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
FinalVolume:	99	53	0	117	86	201	187	554	0	90	709	25
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	1.00	1.00	2.00	1.00	1.00	1.00	3.00	1.00	1.00	2.00	1.00
Final Sat.:	3000	1650	1650	3000	1650	1650	1650	4950	1650	1650	3300	1650
Capacity Analysis Module:												
Vol/Sat:	0.03	0.03	0.00	0.04	0.05	0.12	0.11	0.11	0.00	0.05	0.21	0.01
Crit Volume:	49					201	187				354	
Crit Moves:	****					****	****				****	

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                     Level Of Service Computation Report
                  CCTALOS Method (Base Volume Alternative)
********************************************************************************
Intersection #13 Lone Tree Way/Deer Valley Road
********************************************************************************
Cycle (sec):          100                 Critical Vol./Cap.(X):         0.707
Loss Time (sec):        0 (Y+R=4.0 sec)   Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         78                 Level Of Service:                  C
********************************************************************************
Street Name:          Deer Valley Road                   Lone Tree Way
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:        2  0  1  1  0   1  0  1  1  0   1  0  2  0  1   1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 7:45 - 8:45 PM
Base Vol:     279  245   111   353  457    17    35  644   157   185  833   185
Growth 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
Initial Bse:  279  245   111   353  457    17    35  644   157   185  833   185
User 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
PHF Adj:     0.89 0.89  0.89  0.89 0.89  0.89  0.89 0.89  0.89  0.89 0.89  0.89
PHF Volume:   313  275   125   397  513    19    39  724   176   208  936   208
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  313  275   125   397  513    19    39  724   176   208  936   208
RTOR Reduct:    0    0     0     0    0     0     0    0   172     0    0   208
RTOR Vol:     313  275   125   397  513    19    39  724     4   208  936     0
PCE 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
MLF 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
FinalVolume:  313  275   125   397  513    19    39  724     4   208  936     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  0.91 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       2.00 1.38  0.62  1.00 1.93  0.07  1.00 2.00  1.00  1.00 2.00  1.00
Final Sat.:  3000 2271  1029  1650 3182   118  1650 3300  1650  1650 3300  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.10 0.12  0.12  0.24 0.16  0.16  0.02 0.22  0.00  0.13 0.28  0.00
Crit Volume:       200         397                     362         208
Crit Moves:       ****        ****                    ****        ****
********************************************************************************
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                     Level Of Service Computation Report
                  CCTALOS Method (Base Volume Alternative)
*********************************************************************************
Intersection #14 Lone Tree Way/Hillcrest Avenue
*********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):          0.440
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):       xxxxxx
Optimal Cycle:         41                Level Of Service:                   A
*********************************************************************************
Street Name:          Hillcrest Avenue                    Lone Tree Way
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        1  0  1  1  0   1  1  1  0  1   1  0  2  0  1   1  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 7:45 - 8:45 AM
Base Vol:     36   53    13  279   85   269  177  495    18   24  862   160
Growth 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
Initial Bse:  36   53    13  279   85   269  177  495    18   24  862   160
User 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
PHF Adj:    0.90 0.90  0.90 0.90 0.90  0.90 0.90 0.90  0.90 0.90 0.90  0.90
PHF Volume:   40   59    14  310   94   299  197  550    20   27  958   178
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  40   59    14  310   94   299  197  550    20   27  958   178
RTOR Reduct:   0    0     0    0    0   197    0    0    20    0    0   171
RTOR Vol:     40   59    14  310   94   102  197  550     0   27  958     7
PCE 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
MLF 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
FinalVolume:  40   59    14  310   94   102  197  550     0   27  958     7
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650  1650
Adjustment: 1.00 1.00  1.00 0.91 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:      1.00 1.61  0.39 2.00 1.00  1.00 1.00 2.00  1.00 1.00 3.00  1.00
Final Sat.: 1650 2650   650 3000 1650  1650 1650 3300  1650 1650 4950  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.02 0.02  0.02 0.10 0.06  0.06 0.12 0.17  0.00 0.02 0.19  0.00
Crit Volume:  40              155              197                   319
Crit Moves: ****             ****             ****                  ****
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                     Level Of Service Computation Report
                  CCTALOS Method (Base Volume Alternative)
*********************************************************************************
Intersection #15 Lone Tree Way/Vista Grande Drive
*********************************************************************************
Cycle (sec):           100                 Critical Vol./Cap.(X):         0.322
Loss Time (sec):         0 (Y+R=4.0 sec)   Average Delay (sec/veh):      xxxxxx
Optimal Cycle:          27                 Level Of Service:                  A
*********************************************************************************
Street Name:          Vista Grande Drive                   Lone Tree Way
Approach:        North Bound      South Bound      East Bound       West Bound
Movement:       L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:          Permitted        Permitted        Protected        Protected
Rights:            Include          Include          Include          Include
Min. Green:      0    0     0    0    0     0    0    0     0    0    0     0
Lanes:          1  0  0  1  0   1  0  0  1  0   1  0  2  1  0   1  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 8:00 - 9:00 PM
Base Vol:       39   14   123   24   16    41   20  693    30   59  967    37
Growth 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
Initial Bse:    39   14   123   24   16    41   20  693    30   59  967    37
User 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
PHF Adj:      0.93 0.93  0.93 0.93 0.93  0.93 0.93 0.93  0.93 0.93 0.93  0.93
PHF Volume:     42   15   132   26   17    44   22  745    32   63 1040    40
Reduct Vol:      0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    42   15   132   26   17    44   22  745    32   63 1040    40
RTOR Reduct:     0    0     0    0    0     0    0    0     0    0    0     0
RTOR Vol:       42   15   132   26   17    44   22  745    32   63 1040    40
PCE 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
MLF 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
FinalVolume:    42   15   132   26   17    44   22  745    32   63 1040    40
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:        1.00 0.10  0.90 1.00 0.28  0.72 1.00 2.88  0.12 1.00 2.89  0.11
Final Sat.:   1720  176  1544 1720  483  1237 1720 4946   214 1720 4970   190
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.02 0.09  0.09 0.02 0.04  0.04 0.01 0.15  0.15 0.04 0.21  0.21
Crit Volume:       147          26                22                    360
Crit Moves:       ****        ****              ****                   ****
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                      Level Of Service Computation Report
                   CCTALOS Method (Base Volume Alternative)
********************************************************************************
Intersection #16 Country Hills Drive/Hillcrest Avenue
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.444
Loss Time (sec):       0 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        41                Level Of Service:                  A
********************************************************************************
Street Name:          Hillcrest Avenue              Country Hills Drive
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Protected        Protected       Split Phase      Split Phase
Rights:            Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:         1  0  1  1  0   1  0  1  1  0   1  0  0  1  0   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 7:45 - 8:45 AM
Base Vol:      70  297    31    63  439    26    44   77   143    84   93   117
Growth 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
Initial Bse:   70  297    31    63  439    26    44   77   143    84   93   117
User Adj:    0.83 0.83  0.83  0.83 0.83  0.83  0.83 0.83  0.83  0.83 0.83  0.83
PHF Adj:     0.83 0.83  0.83  0.83 0.83  0.83  0.83 0.83  0.83  0.83 0.83  0.83
PHF Volume:    70  297    31    63  439    26    44   77   143    84   93   117
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   70  297    31    63  439    26    44   77   143    84   93   117
RTOR Reduct:    0    0     0     0    0     0     0    0     0     0    0     0
RTOR Vol:      70  297    31    63  439    26    44   77   143    84   93   117
PCE 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
MLF 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
FinalVolume:   70  297    31    63  439    26    44   77   143    84   93   117
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.81  0.19  1.00 1.89  0.11  1.00 0.35  0.65  1.00 0.44  0.56
Final Sat.:  1650 2988   312  1650 3115   185  1650  578  1073  1650  731   919
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.04 0.10  0.10  0.04 0.14  0.14  0.03 0.13  0.13  0.05 0.13  0.13
Crit Volume:   70                     233                220                 210
Crit Moves:  ****                    ****               ****                ****
********************************************************************************
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                       Level Of Service Computation Report
                    CCTALOS Method (Base Volume Alternative)
*******************************************************************************
Intersection #18 Laurell/Hillcrest
*******************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.344
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         28                Level Of Service:                  A
*******************************************************************************
Street Name:          Hillcrest Avenue                    Laurel Road
Approach:      North Bound     South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected       Protected        Permitted        Permitted
Rights:           Ignore          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        1  0  2  0  1   1  0  1  1  0   1  0  0  1  0   1  0  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 7:45 - 8:45 AM
Base Vol:      67  372    25   74  377    80  150   50   100   48   67   155
Growth 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
Initial Bse:   67  372    25   74  377    80  150   50   100   48   67   155
User 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
PHF Adj:     0.89 0.89  0.89 0.89 0.89  0.89 0.89 0.89  0.89 0.89 0.89  0.89
PHF Volume:    75  418    28   83  424    90  169   56   112   54   75   174
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   75  418    28   83  424    90  169   56   112   54   75   174
RTOR Reduct:    0    0     0    0    0     0    0    0     0    0    0    83
RTOR Vol:      75  418    28   83  424    90  169   56   112   54   75    91
PCE 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
MLF 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
FinalVolume:   75  418    28   83  424    90  169   56   112   54   75    91
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       1.00 2.00  1.00 1.00 1.65  0.35 1.00 0.33  0.67 1.00 1.00  1.00
Final Sat.:  1720 3440  1720 1720 2838   602 1720  573  1147 1720 1720  1720
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.04 0.12  0.02 0.05 0.15  0.15 0.10 0.10  0.10 0.03 0.04  0.05
Crit Volume:   75                  257         169                          91
Crit Moves:  ****                 ****        ****                        ****
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                       Level Of Service Computation Report
                     CCTALOS Method (Base Volume Alternative)
********************************************************************************
Intersection #8 Lone Tree Way/Canada Valley Road
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.544
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         50                Level Of Service:                  A
********************************************************************************
Street Name:           Canada Valley Road                 Lone Tree Way
Approach:        North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:          Protected        Protected        Protected        Protected
Rights:             Include          Include          Include          Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:         2  0  0  1  1    1  0  1  0  1    1  0  3  0  1    2  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 5:00 - 6:00 PM
Base Vol:      84    55   173  175    56    22   54  1354    55  329   942   253
Growth 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
Initial Bse:   84    55   173  175    56    22   54  1354    55  329   942   253
User 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
PHF Adj:     0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96  0.96
PHF Volume:    88    57   180  182    58    23   56  1410    57  343   981   264
Reduct Vol:     0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:   88    57   180  182    58    23   56  1410    57  343   981   264
RTOR Reduct:    0     0   180    0     0    23    0     0    48    0     0   182
RTOR Vol:      88    57     0  182    58     0   56  1410     9  343   981    81
PCE 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
MLF 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
FinalVolume:   88    57     0  182    58     0   56  1410     9  343   981    81
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650  1650
Adjustment:  0.91  1.00  0.91 1.00  1.00  1.00 1.00  1.00  1.00 0.91  1.00  1.00
Lanes:       2.00  1.00  1.00 1.00  1.00  1.00 1.00  3.00  1.00 2.00  3.00  1.00
Final Sat.:  3000  1650  1500 1650  1650  1650 1650  4950  1650 3000  4950  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.03  0.03  0.00 0.11  0.04  0.00 0.03  0.28  0.01 0.11  0.20  0.05
Crit Volume:         57        182                    470        171
Crit Moves:        ****       ****                   ****       ****
********************************************************************************
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                    Level Of Service Computation Report
                 CCTALOS Method (Base Volume Alternative)
********************************************************************************
Intersection #9 Lone Tree Way/SB SR 4 Bypass Ramps
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):        0.585
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):     xxxxxx
Optimal Cycle:         55                Level Of Service:                 A
********************************************************************************
Street Name:        SB SR 4 Bypass Ramps                  Lone Tree Way
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        0  0  0  0  0   1  1  0  0  1   0  0  3  0  1   2  0  3  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 4:30 - 5:30 PM
Base Vol:       0    0     0  416   10   361    0 1169   541   98 1153     0
Growth 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
Initial Bse:    0    0     0  416   10   361    0 1169   541   98 1153     0
User 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
PHF Adj:     0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
PHF Volume:     0    0     0  438   11   380    0 1231   569  103 1214     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0    0     0  438   11   380    0 1231   569  103 1214     0
RTOR Reduct:    0    0     0    0    0     0    0    0     0    0    0     0
RTOR Vol:       0    0     0  438   11   380    0 1231   569  103 1214     0
PCE 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
MLF 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
FinalVolume:    0    0     0  438   11   380    0 1231   569  103 1214     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:  1.00 1.00  1.00 0.91 1.00  1.00 1.00 1.00  1.00 0.91 1.00  1.00
Lanes:       0.00 0.00  0.00 1.95 0.05  1.00 0.00 3.00  1.00 2.00 3.00  0.00
Final Sat.:     0    0     0 3054   81  1720    0 5160  1720 3127 5160     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.14 0.13  0.22 0.00 0.24  0.33 0.03 0.24  0.00
Crit Volume:    0                        380              569   52
Crit Moves:                             ****             **** ****
********************************************************************************
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-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
                   CCTALOS Method (Base Volume Alternative)
*******************************************************************************
Intersection #10 Lone Tree Way/NB SR 4 Bypass Ramps
*******************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.481
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         44               Level Of Service:                  A
*******************************************************************************
Street Name:          NB SR 4 Bypass Ramps                 Lone Tree Way
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Split Phase      Split Phase        Protected        Protected
Rights:            Include          Include          Include          Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:        1  1  0  0  1    0  0  0  0  0    0  0  3  0  1    1  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 May 2008 << 4:45 - 5:45 PM
Base Vol:     437   43   137    0    0     0    0 1404   264   21  831   357
Growth 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
Initial Bse:  437   43   137    0    0     0    0 1404   264   21  831   357
User 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
PHF Adj:     0.91 0.91  0.91 0.91 0.91  0.91 0.91 0.91  0.91 0.91 0.91  0.91
PHF Volume:   480   47   151    0    0     0    0 1543   290   23  913   392
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  480   47   151    0    0     0    0 1543   290   23  913   392
RTOR Reduct:    0    0    23    0    0     0    0    0   264    0    0     0
RTOR Vol:     480   47   127    0    0     0    0 1543    26   23  913   392
PCE 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
MLF 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
FinalVolume:  480   47   127    0    0     0    0 1543    26   23  913   392
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:  0.91 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       1.82 0.18  1.00 0.00 0.00  0.00 0.00 3.00  1.00 1.00 3.00  1.00
Final Sat.:  2847  308  1720    0    0     0    0 5160  1720 1720 5160  1720
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.17 0.15  0.07 0.00 0.00  0.00 0.00 0.30  0.02 0.01 0.18  0.23
Crit Volume:  264                    0                514          23
Crit Moves:  ****                                    ****         ****
*******************************************************************************
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--------------------------------------------------------------------------------
                      Level Of Service Computation Report
                    CCTALOS Method (Base Volume Alternative)
********************************************************************************
Intersection #11 Lone Tree Way/Slatten Ranch Road
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.487
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         44               Level Of Service:                  A
********************************************************************************
Street Name:          Slatten Ranch Road                   Lone Tree Way
Approach:       North Bound       South Bound       East Bound        West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Split Phase       Split Phase        Protected         Protected
Rights:            Include           Include           Include           Include
Min. Green:     0     0     0     0     0     0     0     0     0     0     0     0
Lanes:         2  0  1  1  0    2  0  1  0  1    2  0  3  0  1    1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 22 May 2008 << 5:00 - 6:00 PM
Base Vol:      51    76   167   114    67   101   217   892   256   160   803    55
Growth 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
Initial Bse:   51    76   167   114    67   101   217   892   256   160   803    55
User 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
PHF Adj:     0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94
PHF Volume:    54    81   178   121    71   107   231   949   272   170   854    59
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   54    81   178   121    71   107   231   949   272   170   854    59
RTOR Reduct:    0     0     0     0     0   107     0     0    30     0     0    59
RTOR Vol:      54    81   178   121    71     0   231   949   242   170   854     0
PCE 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
MLF 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
FinalVolume:   54    81   178   121    71     0   231   949   242   170   854     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650  1650  1650  1650  1650  1650  1650  1650  1650  1650  1650  1650
Adjustment:  0.91  1.00  1.00  0.91  1.00  1.00  0.91  1.00  1.00  1.00  1.00  1.00
Lanes:       2.00  1.00  1.00  2.00  1.00  1.00  2.00  3.00  1.00  1.00  2.00  1.00
Final Sat.:  3000  1650  1650  3000  1650  1650  3000  4950  1650  1650  3300  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02  0.05  0.11  0.04  0.04  0.00  0.08  0.19  0.15  0.10  0.26  0.00
Crit Volume:             178          71         115                      427
Crit Moves:             ****        ****        ****                     ****
********************************************************************************
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                      Level Of Service Computation Report
                   CCTALOS Method (Base Volume Alternative)
*********************************************************************************
Intersection #12 Lone Tree Way/Empire Avenue
*********************************************************************************
Cycle (sec):          100                 Critical Vol./Cap.(X):         0.497
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):       xxxxxx
Optimal Cycle:         45                 Level Of Service:                  A
*********************************************************************************
Street Name:             Empire Avenue                      Lone Tree Way
Approach:       North Bound       South Bound        East Bound        West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Split Phase       Split Phase        Protected         Protected
Rights:            Include           Include           Include           Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:         2  0  1  0  1    2  0  1  1  0    1  0  3  0  1    1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 22 May 2008 << 5:00 - 6:00 PM
Base Vol:      76    46    36   231   115   176   230   759   112    53   702   129
Growth 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
Initial Bse:   76    46    36   231   115   176   230   759   112    53   702   129
User 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
PHF Adj:     0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98
PHF Volume:    78    47    37   236   117   180   235   774   114    54   716   132
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   78    47    37   236   117   180   235   774   114    54   716   132
RTOR Reduct:    0     0    37     0     0     0     0     0    43     0     0   130
RTOR Vol:      78    47     0   236   117   180   235   774    72    54   716     2
PCE 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
MLF 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
FinalVolume:   78    47     0   236   117   180   235   774    72    54   716     2
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650  1650  1650  1650  1650  1650  1650  1650  1650  1650  1650  1650
Adjustment:  0.91  1.00  1.00  0.91  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:       2.00  1.00  1.00  2.00  1.00  1.00  1.00  3.00  1.00  1.00  2.00  1.00
Final Sat.:  3000  1650  1650  3000  1650  1650  1650  4950  1650  1650  3300  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.03  0.03  0.00  0.08  0.07  0.11  0.14  0.16  0.04  0.03  0.22  0.00
Crit Volume:         47                     180   235                     358
Crit Moves:        ****                    ****  ****                    ****
*********************************************************************************
```

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

Intersection #13 Lone Tree Way/Deer Valley Road

Cycle (sec):	100	Critical Vol./Cap.(X):	0.609
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	58	Level Of Service:	B

Street Name:	Deer Valley Road						Lone Tree Way					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2 0	1	1 0	1 0	1	1 0	1 0	2	0 1	1 0	2	0 1
Volume Module: >> Count Date: 15 May 2008 << 5:00 - 6:00 PM												
Base Vol:	192	365	168	168	191	14	87	780	147	151	497	154
Growth 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
Initial Bse:	192	365	168	168	191	14	87	780	147	151	497	154
User 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
PHF Adj:	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
PHF Volume:	198	376	173	173	197	14	90	804	152	156	512	159
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	198	376	173	173	197	14	90	804	152	156	512	159
RTOR Reduct:	0	0	0	0	0	0	0	0	109	0	0	159
RTOR Vol:	198	376	173	173	197	14	90	804	43	156	512	0
PCE 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
MLF 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
FinalVolume:	198	376	173	173	197	14	90	804	43	156	512	0
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	1.37	0.63	1.00	1.86	0.14	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	3000	2260	1040	1650	3075	225	1650	3300	1650	1650	3300	1650
Capacity Analysis Module:												
Vol/Sat:	0.07	0.17	0.17	0.10	0.06	0.06	0.05	0.24	0.03	0.09	0.16	0.00
Crit Volume:		275		173				402		156		
Crit Moves:		****		****				****		****		

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                       Level Of Service Computation Report
                    CCTALOS Method (Base Volume Alternative)
*********************************************************************************
Intersection #14 Lone Tree Way/Hillcrest Avenue
*********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.544
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         50                Level Of Service:                  A
*********************************************************************************
Street Name:          Hillcrest Avenue                   Lone Tree Way
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        1  0  1  1  0    1  1  1  0  1    1  0  2  0  1    1  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 4:15 - 5:15 PM
Base Vol:      17   87    26   423   77    97   131  915    22    43  720   229
Growth 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
Initial Bse:   17   87    26   423   77    97   131  915    22    43  720   229
User 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
PHF Adj:     0.88 0.88  0.88  0.88 0.88  0.88  0.88 0.88  0.88  0.88 0.88  0.88
PHF Volume:    19   99    30   481   88   110   149 1040    25    49  818   260
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   19   99    30   481   88   110   149 1040    25    49  818   260
RTOR Reduct:    0    0     0     0    0   110     0    0    19     0    0   260
RTOR Vol:      19   99    30   481   88     0   149 1040     6    49  818     0
PCE 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
MLF 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
FinalVolume:   19   99    30   481   88     0   149 1040     6    49  818     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  0.91 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.54  0.46  2.00 1.00  1.00  1.00 2.00  1.00  1.00 3.00  1.00
Final Sat.:  1650 2541   759  3000 1650  1650  1650 3300  1650  1650 4950  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.04  0.04  0.16 0.05  0.00  0.09 0.32  0.00  0.03 0.17  0.00
Crit Volume:              64   240                     520          49
Crit Moves:             ****  ****                    ****        ****
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                      Level Of Service Computation Report
                  CCTALOS Method (Base Volume Alternative)
********************************************************************************
Intersection #15 Lone Tree Way/Vista Grande Drive
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.437
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         33                Level Of Service:                  A
********************************************************************************
Street Name:          Vista Grande Drive                  Lone Tree Way
Approach:        North Bound      South Bound      East Bound       West Bound
Movement:       L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:          Permitted        Permitted        Protected        Protected
Rights:            Include          Include          Include          Include
Min. Green:     0     0     0   0     0     0   0     0     0   0     0     0
Lanes:          1  0  0  1  0   1  0  0  1  0   1  0  2  1  0   1  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 4:45 - 5:45 PM
Base Vol:       35    10   114   42     9    20   18  1282    44  121   931    24
Growth 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
Initial Bse:    35    10   114   42     9    20   18  1282    44  121   931    24
User 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
PHF Adj:      0.97  0.97  0.97 0.97  0.97  0.97 0.97  0.97  0.97 0.97  0.97  0.97
PHF Volume:     36    10   118   43     9    21   19  1322    45  125   960    25
Reduct Vol:      0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:    36    10   118   43     9    21   19  1322    45  125   960    25
RTOR Reduct:     0     0     0    0     0     0    0     0     0    0     0     0
RTOR Vol:       36    10   118   43     9    21   19  1322    45  125   960    25
PCE 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
MLF 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
FinalVolume:    36    10   118   43     9    21   19  1322    45  125   960    25
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1720  1720  1720 1720  1720  1720 1720  1720  1720 1720  1720  1720
Adjustment:   1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Lanes:        1.00  0.08  0.92 1.00  0.31  0.69 1.00  2.90  0.10 1.00  2.92  0.08
Final Sat.:   1720   139  1581 1720   534  1186 1720  4989   171 1720  5030   130
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.02  0.07  0.07 0.03  0.02  0.02 0.01  0.26  0.26 0.07  0.19  0.19
Crit Volume:         128         43                            456  125
Crit Moves:         ****       ****                           **** ****
********************************************************************************
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                     Level Of Service Computation Report
                  CCTALOS Method (Base Volume Alternative)
********************************************************************************
Intersection #16 Country Hills Drive/Hillcrest Avenue
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.315
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         33               Level Of Service:                  A
********************************************************************************
Street Name:          Hillcrest Avenue              Country Hills Drive
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:        1  0  1  1  0   1  0  1  1  0   1  0  0  1  0   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 5:00 - 6:00 PM
Base Vol:      73  281    49    89  376    63    42   51    82    34   50    45
Growth 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
Initial Bse:   73  281    49    89  376    63    42   51    82    34   50    45
User Adj:    0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:    73  281    49    89  376    63    42   51    82    34   50    45
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   73  281    49    89  376    63    42   51    82    34   50    45
RTOR Reduct:    0    0     0     0    0     0     0    0     0     0    0     0
RTOR Vol:      73  281    49    89  376    63    42   51    82    34   50    45
PCE 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
MLF 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
FinalVolume:   73  281    49    89  376    63    42   51    82    34   50    45
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.70  0.30  1.00 1.71  0.29  1.00 0.38  0.62  1.00 0.53  0.47
Final Sat.:  1650 2810   490  1650 2826   474  1650  633  1017  1650  868   782
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.04 0.10  0.10  0.05 0.13  0.13  0.03 0.08  0.08  0.02 0.06  0.06
Crit Volume:   73                    220                     133         95
Crit Moves:  ****                   ****                    ****       ****
********************************************************************************
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--------------------------------------------------------------------------------
                     Level Of Service Computation Report
                CCTALOS Method (Base Volume Alternative)
********************************************************************************
Intersection #18 Laurell/Hillcrest
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.219
Loss Time (sec):       0 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        24                Level Of Service:                  A
********************************************************************************
Street Name:          Hillcrest Avenue                   Laurel Road
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected         Permitted        Permitted
Rights:           Ignore           Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        1  0  2  0  1   1  0  1  1  0   1  0  0  1  0   1  0  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 5:00 - 6:00 PM
Base Vol:      27  302    39  162  459    50   17    7    22   35    9   133
Growth 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
Initial Bse:   27  302    39  162  459    50   17    7    22   35    9   133
User Adj:    0.98 0.98  0.98 0.98 0.98  0.98 0.98 0.98  0.98 0.98 0.98  0.98
PHF Adj:     0.98 0.98  0.98 0.98 0.98  0.98 0.98 0.98  0.98 0.98 0.98  0.98
PHF Volume:    27  302    39  162  459    50   17    7    22   35    9   133
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   27  302    39  162  459    50   17    7    22   35    9   133
RTOR Reduct:    0    0     0    0    0     0    0    0     0    0    0   133
RTOR Vol:      27  302    39  162  459    50   17    7    22   35    9     0
PCE 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
MLF 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
FinalVolume:   27  302    39  162  459    50   17    7    22   35    9     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       1.00 2.00  1.00 1.00 1.80  0.20 1.00 0.24  0.76 1.00 1.00  1.00
Final Sat.:  1720 3440  1720 1720 3102   338 1720  415  1305 1720 1720  1720
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02 0.09  0.02 0.09 0.15  0.15 0.01 0.02  0.02 0.02 0.01  0.00
Crit Volume:       151         162                    29        35
Crit Moves:       ****        ****                  ****      ****
********************************************************************************
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Near-Term No Project

FEHR & PEERS
TRANSPORTATION CONSULTANTS

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                     Level Of Service Computation Report
                CCTALOS Method (Future Volume Alternative)
*********************************************************************************
Intersection #8 Lone Tree Way/Canada Valley Road
*********************************************************************************
Cycle (sec):          100                 Critical Vol./Cap.(X):         0.454
Loss Time (sec):        0 (Y+R=4.0 sec)   Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         42                 Level Of Service:                  A
*********************************************************************************
Street Name:         Canada Valley Road                  Lone Tree Way
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        2  0  0  1  1    1  0  1  0  1    1  0  3  0  1    2  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 7:45 - 8:45 AM
Base Vol:      36   14    51   190   31    34    29  746    52   166 1005   168
Growth 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
Initial Bse:   36   14    51   190   31    34    29  746    52   166 1005   168
Added Vol:     40    0   133     0    0     0     0  225    13    45  114     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   76   14   184   190   31    34    29  971    65   211 1119   168
User 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
PHF Adj:     0.90 0.90  0.90  0.90 0.90  0.90  0.90 0.90  0.90  0.90 0.90  0.90
PHF Volume:    84   16   204   211   34    38    32 1079    72   234 1243   187
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   84   16   204   211   34    38    32 1079    72   234 1243   187
RTOR Reduct:    0    0   129     0    0    32     0    0    46     0    0   187
RTOR Vol:      84   16    76   211   34     6    32 1079    26   234 1243     0
PCE 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
MLF 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
FinalVolume:   84   16    76   211   34     6    32 1079    26   234 1243     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  0.91 1.00  0.91  1.00 1.00  1.00  1.00 1.00  1.00  0.91 1.00  1.00
Lanes:       2.00 0.34  1.66  1.00 1.00  1.00  1.00 3.00  1.00  2.00 3.00  1.00
Final Sat.:  3000  564  2487  1650 1650  1650  1650 4950  1650  3000 4950  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.03 0.03  0.03  0.13 0.02  0.00  0.02 0.22  0.02  0.08 0.25  0.00
Crit Volume:              46   211                     360         117
Crit Moves:             ****  ****                    ****        ****
*********************************************************************************
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                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
*********************************************************************************
Intersection #9 Lone Tree Way/SB SR 4 Bypass Ramps
*********************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):        0.602
Loss Time (sec):       0 (Y+R=4.0 sec)  Average Delay (sec/veh):    xxxxxx
Optimal Cycle:        57              Level Of Service:                 B
*********************************************************************************
Street Name:       SB SR 4 Bypass Ramps                 Lone Tree Way
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        0  0  0  0  0   1  1  0  0  1   0  0  3  0  1   2  0  3  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 7:45 - 8:45 AM
Base Vol:       0    0     0  287    6   353    0  571   401   72 1000     0
Growth 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
Initial Bse:    0    0     0  287    6   353    0  571   401   72 1000     0
Added Vol:      0    0     0    0    0    57    0  277    82    0  102     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:    0    0     0  287    6   410    0  848   483   72 1102     0
User 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
PHF Adj:     0.90 0.90  0.90 0.90 0.90  0.90 0.90 0.90  0.90 0.90 0.90  0.90
PHF Volume:     0    0     0  319    7   456    0  942   537   80 1224     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0    0     0  319    7   456    0  942   537   80 1224     0
RTOR Reduct:    0    0     0    0    0     0    0    0     0    0    0     0
RTOR Vol:       0    0     0  319    7   456    0  942   537   80 1224     0
PCE 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
MLF 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
FinalVolume:    0    0     0  319    7   456    0  942   537   80 1224     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:  1.00 1.00  1.00 0.91 1.00  1.00 1.00 1.00  1.00 0.91 1.00  1.00
Lanes:       0.00 0.00  0.00 1.96 0.04  1.00 0.00 3.00  1.00 2.00 3.00  0.00
Final Sat.:     0    0     0 3063   70  1720    0 5160  1720 3127 5160     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.10 0.09  0.26 0.00 0.18  0.31 0.03 0.24  0.00
Crit Volume:    0                        456              537   40
Crit Moves:                             ****             ****  ****
*********************************************************************************
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                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #10 Lone Tree Way/NB SR 4 Bypass Ramps
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):        0.338
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):     xxxxxx
Optimal Cycle:         34                Level Of Service:                 A
********************************************************************************
Street Name:       NB SR 4 Bypass Ramps                  Lone Tree Way
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:        1  1  0  0  1   0  0  0  0  0   0  0  3  0  1   1  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 May 2008 << 7:30 - 8:30 AM
Base Vol:     383   29    79    0     0     0    0   662   160    8   671   245
Growth 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
Initial Bse:  383   29    79    0     0     0    0   662   160    8   671   245
Added Vol:     35    0     0    0     0     0    0   130   147    0    67     0
PasserByVol:    0    0     0    0     0     0    0     0     0    0     0     0
Initial Fut:  418   29    79    0     0     0    0   792   307    8   738   245
User 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
PHF Adj:     0.89 0.89  0.89 0.89 0.89  0.89 0.89 0.89  0.89 0.89 0.89  0.89
PHF Volume:   470   33    89    0     0     0    0   890   345    9   829   275
Reduct Vol:     0    0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:  470   33    89    0     0     0    0   890   345    9   829   275
RTOR Reduct:    0    0     9    0     0     0    0     0   258    0     0     0
RTOR Vol:     470   33    80    0     0     0    0   890    87    9   829   275
PCE 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
MLF 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
FinalVolume:  470   33    80    0     0     0    0   890    87    9   829   275
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:  0.91 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       1.87 0.13  1.00 0.00 0.00  0.00 0.00 3.00  1.00 1.00 3.00  1.00
Final Sat.:  2924  223  1720    0     0     0    0 5160  1720 1720 5160  1720
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.16 0.15  0.05 0.00 0.00  0.00 0.00 0.17  0.05 0.01 0.16  0.16
Crit Volume:  251                     0               297            9
Crit Moves:  ****                                    ****         ****
********************************************************************************
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                   Level Of Service Computation Report
                CCTALOS Method (Future Volume Alternative)
*********************************************************************************
Intersection #11 Lone Tree Way/Slatten Ranch Road
*********************************************************************************
Cycle (sec):          100                 Critical Vol./Cap.(X):          0.484
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):        xxxxxx
Optimal Cycle:         44                 Level Of Service:                   A
*********************************************************************************
Street Name:          Slatten Ranch Road                    Lone Tree Way
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    0     0     0     0     0     0     0     0     0     0     0     0
Lanes:        2  0  1  1  0    2  0  1  0  1    2  0  3  0  1    1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 22 May 2008 << 7:15 - 8:15 AM
Base Vol:      39    47   191    42    35    24    74   484    91    54   837    29
Growth 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
Initial Bse:   39    47   191    42    35    24    74   484    91    54   837    29
Added Vol:      0     0     0     0     0     0     0   130     0     0    67     0
PasserByVol:    0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:   39    47   191    42    35    24    74   614    91    54   904    29
User 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
PHF Adj:     0.90  0.90  0.90  0.90  0.90  0.90  0.90  0.90  0.90  0.90  0.90  0.90
PHF Volume:    43    52   212    47    39    27    82   682   101    60  1004    32
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   43    52   212    47    39    27    82   682   101    60  1004    32
RTOR Reduct:    0     0     0     0     0    27     0     0    24     0     0    26
RTOR Vol:      43    52   212    47    39     0    82   682    77    60  1004     7
PCE 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
MLF 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
FinalVolume:   43    52   212    47    39     0    82   682    77    60  1004     7
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650  1650  1650  1650  1650  1650  1650  1650  1650  1650  1650  1650
Adjustment:  0.91  1.00  1.00  0.91  1.00  1.00  0.91  1.00  1.00  1.00  1.00  1.00
Lanes:       2.00  1.00  1.00  2.00  1.00  1.00  2.00  3.00  1.00  1.00  2.00  1.00
Final Sat.:  3000  1650  1650  3000  1650  1650  3000  4950  1650  1650  3300  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01  0.03  0.13  0.02  0.02  0.00  0.03  0.14  0.05  0.04  0.30  0.00
Crit Volume:              212          39          41                      502
Crit Moves:              ****        ****        ****                     ****
*********************************************************************************
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                        Level Of Service Computation Report
                     CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #12 Lone Tree Way/Empire Avenue
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.573
Loss Time (sec):        0 (Y+R=4.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         53               Level Of Service:                  A
********************************************************************************
Street Name:               Empire Avenue                    Lone Tree Way
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        2  0  1  0  1   2  0  1  1  0   1  0  3  0  1   1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 22 May 2008 << 7:15 - 8:15 AM
Base Vol:      89   48    41   105   77   181   168  499    26    81  638    80
Growth 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
Initial Bse:   89   48    41   105   77   181   168  499    26    81  638    80
Added Vol:      0    0     0     0    0    42    79   51     0     0   25     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   89   48    41   105   77   223   247  550    26    81  663    80
User 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
PHF Adj:     0.90 0.90  0.90  0.90 0.90  0.90  0.90 0.90  0.90  0.90 0.90  0.90
PHF Volume:    99   53    46   117   86   248   274  611    29    90  737    89
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   99   53    46   117   86   248   274  611    29    90  737    89
RTOR Reduct:    0    0    46     0    0     0     0    0    29     0    0    64
RTOR Vol:      99   53     0   117   86   248   274  611     0    90  737    25
PCE 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
MLF 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
FinalVolume:   99   53     0   117   86   248   274  611     0    90  737    25
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  0.91 1.00  1.00  0.91 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       2.00 1.00  1.00  2.00 1.00  1.00  1.00 3.00  1.00  1.00 2.00  1.00
Final Sat.:  3000 1650  1650  3000 1650  1650  1650 4950  1650  1650 3300  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.03 0.03  0.00  0.04 0.05  0.15  0.17 0.12  0.00  0.05 0.22  0.01
Crit Volume:   49                             248   274                    368
Crit Moves:  ****                            ****  ****                   ****
********************************************************************************
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-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
*******************************************************************************
Intersection #13 Lone Tree Way/Deer Valley Road
*******************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.773
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        100                Level Of Service:                  C
*******************************************************************************
Street Name:          Deer Valley Road                 Lone Tree Way
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        2  0  1  1  0   1  0  1  1  0   1  0  2  0  1   1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 7:45 - 8:45 PM
Base Vol:     279  245   111  353  457    17   35  644   157  185  833   185
Growth 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
Initial Bse:  279  245   111  353  457    17   35  644   157  185  833   185
Added Vol:     19    0    63    0    0     0    0   45     7   43   88     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:  298  245   174  353  457    17   35  689   164  228  921   185
User 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
PHF Adj:     0.89 0.89  0.89 0.89 0.89  0.89 0.89 0.89  0.89 0.89 0.89  0.89
PHF Volume:   335  275   196  397  513    19   39  774   184  256 1035   208
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  335  275   196  397  513    19   39  774   184  256 1035   208
RTOR Reduct:    0    0     0    0    0     0    0    0   184    0    0   208
RTOR Vol:     335  275   196  397  513    19   39  774     0  256 1035     0
PCE 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
MLF 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
FinalVolume:  335  275   196  397  513    19   39  774     0  256 1035     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650  1650
Adjustment:  0.91 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       2.00 1.17  0.83 1.00 1.93  0.07 1.00 2.00  1.00 1.00 2.00  1.00
Final Sat.:  3000 1930  1370 1650 3182   118 1650 3300  1650 1650 3300  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.11 0.14  0.14 0.24 0.16  0.16 0.02 0.23  0.00 0.16 0.31  0.00
Crit Volume:             235  397                        387       256
Crit Moves:             ****  ****                      ****      ****
*******************************************************************************
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--------------------------------------------------------------------------------
                       Level Of Service Computation Report
                   CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #14 Lone Tree Way/Hillcrest Avenue
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.535
Loss Time (sec):        0 (Y+R=4.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         49               Level Of Service:                  A
********************************************************************************
Street Name:          Hillcrest Avenue                    Lone Tree Way
Approach:      North Bound      South Bound      East Bound      West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        1  0  1  1  0   1  1  1  0  1   1  0  2  0  1   1  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 7:45 - 8:45 AM
Base Vol:      36   53    13  279   85   269  177  495    18   24  862   160
Growth 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
Initial Bse:   36   53    13  279   85   269  177  495    18   24  862   160
Added Vol:      0    0     0  126    0    60   41   66     0    0   90    53
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:   36   53    13  405   85   329  218  561    18   24  952   213
User 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
PHF Adj:     0.90 0.90  0.90 0.90 0.90  0.90 0.90 0.90  0.90 0.90 0.90  0.90
PHF Volume:    40   59    14  450   94   366  242  623    20   27 1058   237
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   40   59    14  450   94   366  242  623    20   27 1058   237
RTOR Reduct:    0    0     0    0    0   242    0    0    20    0    0   237
RTOR Vol:      40   59    14  450   94   123  242  623     0   27 1058     0
PCE 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
MLF 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
FinalVolume:   40   59    14  450   94   123  242  623     0   27 1058     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650  1650
Adjustment:  1.00 1.00  1.00 0.91 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       1.00 1.61  0.39 2.00 1.00  1.00 1.00 2.00  1.00 1.00 3.00  1.00
Final Sat.:  1650 2650   650 3000 1650  1650 1650 3300  1650 1650 4950  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02 0.02  0.02 0.15 0.06  0.07 0.15 0.19  0.00 0.02 0.21  0.00
Crit Volume:   40              225              242                   353
Crit Moves:  ****             ****             ****                  ****
********************************************************************************
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                     Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
*********************************************************************************
Intersection #15 Lone Tree Way/Vista Grande Drive
*********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):         0.354
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):     xxxxxx
Optimal Cycle:         29              Level Of Service:                  A
*********************************************************************************
Street Name:        Vista Grande Drive                  Lone Tree Way
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:        1  0  0  1  0   1  0  0  1  0   1  0  2  1  0   1  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 8:00 - 9:00 PM
Base Vol:      39    14   123    24    16    41    20   693    30    59   967    37
Growth 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
Initial Bse:   39    14   123    24    16    41    20   693    30    59   967    37
Added Vol:      0     0     0     0     0     0     0   191     0     0   152     0
PasserByVol:    0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:   39    14   123    24    16    41    20   884    30    59  1119    37
User 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
PHF Adj:     0.93  0.93  0.93  0.93  0.93  0.93  0.93  0.93  0.93  0.93  0.93  0.93
PHF Volume:    42    15   132    26    17    44    22   951    32    63  1203    40
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   42    15   132    26    17    44    22   951    32    63  1203    40
RTOR Reduct:    0     0     0     0     0     0     0     0     0     0     0     0
RTOR Vol:      42    15   132    26    17    44    22   951    32    63  1203    40
PCE 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
MLF 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
FinalVolume:   42    15   132    26    17    44    22   951    32    63  1203    40
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720  1720  1720  1720  1720  1720  1720  1720  1720  1720  1720  1720
Adjustment:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:       1.00  0.10  0.90  1.00  0.28  0.72  1.00  2.90  0.10  1.00  2.90  0.10
Final Sat.:  1720   176  1544  1720   483  1237  1720  4991   169  1720  4995   165
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02  0.09  0.09  0.02  0.04  0.04  0.01  0.19  0.19  0.04  0.24  0.24
Crit Volume:        147          26                22                      414
Crit Moves:         ****        ****              ****                    ****
*********************************************************************************
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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #16 Country Hills Drive/Hillcrest Avenue
********************************************************************************
Cycle (sec):         100                 Critical Vol./Cap.(X):          0.500
Loss Time (sec):       0 (Y+R=4.0 sec)  Average Delay (sec/veh):       xxxxxx
Optimal Cycle:        46                 Level Of Service:                   A
********************************************************************************
Street Name:           Hillcrest Avenue              Country Hills Drive
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  0  1  0    1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 7:45 - 8:45 AM
Base Vol:      70   297    31    63   439    26    44    77   143    84    93   117
Growth 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
Initial Bse:   70   297    31    63   439    26    44    77   143    84    93   117
Added Vol:      0    87     0     0   184     0     0     0     0     0     0     0
PasserByVol:    0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:   70   384    31    63   623    26    44    77   143    84    93   117
User Adj:    0.83  0.83  0.83  0.83  0.83  0.83  0.83  0.83  0.83  0.83  0.83  0.83
PHF Adj:     0.83  0.83  0.83  0.83  0.83  0.83  0.83  0.83  0.83  0.83  0.83  0.83
PHF Volume:    70   384    31    63   623    26    44    77   143    84    93   117
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   70   384    31    63   623    26    44    77   143    84    93   117
RTOR Reduct:    0     0     0     0     0     0     0     0     0     0     0     0
RTOR Vol:      70   384    31    63   623    26    44    77   143    84    93   117
PCE 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
MLF 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
FinalVolume:   70   384    31    63   623    26    44    77   143    84    93   117
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650  1650  1650  1650  1650  1650  1650  1650  1650  1650  1650  1650
Adjustment:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:       1.00  1.85  0.15  1.00  1.92  0.08  1.00  0.35  0.65  1.00  0.44  0.56
Final Sat.:  1650  3053   247  1650  3168   132  1650   578  1073  1650   731   919
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.04  0.13  0.13  0.04  0.20  0.20  0.03  0.13  0.13  0.05  0.13  0.13
Crit Volume:   70                     325               220                     210
Crit Moves:  ****                    ****              ****                    ****
********************************************************************************
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                        Level Of Service Computation Report
                     CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #18 Laurell/Hillcrest
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):         0.404
Loss Time (sec):        0 (Y+R=4.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         31              Level Of Service:                  A
********************************************************************************
Street Name:          Hillcrest Avenue                     Laurel Road
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Protected        Protected         Permitted        Permitted
Rights:            Ignore          Include           Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:         1  0  2  0  1    1  0  1  1  0    1  0  0  1  0    1  0  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 7:45 - 8:45 AM
Base Vol:      67  372    25    74  377    80   150   50   100    48   67   155
Growth 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
Initial Bse:   67  372    25    74  377    80   150   50   100    48   67   155
Added Vol:      0   87     0     0  184     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   67  459    25    74  561    80   150   50   100    48   67   155
User 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
PHF Adj:     0.89 0.89  0.89  0.89 0.89  0.89  0.89 0.89  0.89  0.89 0.89  0.89
PHF Volume:    75  516    28    83  630    90   169   56   112    54   75   174
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   75  516    28    83  630    90   169   56   112    54   75   174
RTOR Reduct:    0    0     0     0    0     0     0    0     0     0    0    83
RTOR Vol:      75  516    28    83  630    90   169   56   112    54   75    91
PCE 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
MLF 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
FinalVolume:   75  516    28    83  630    90   169   56   112    54   75    91
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720  1720 1720  1720  1720 1720  1720  1720 1720  1720
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 2.00  1.00  1.00 1.75  0.25  1.00 0.33  0.67  1.00 1.00  1.00
Final Sat.:  1720 3440  1720  1720 3011   429  1720  573  1147  1720 1720  1720
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.04 0.15  0.02  0.05 0.21  0.21  0.10 0.10  0.10  0.03 0.04  0.05
Crit Volume:   75                           360   169                         91
Crit Moves:  ****                          ****  ****                       ****
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                        Level Of Service Computation Report
                     CCTALOS Method (Future Volume Alternative)
*******************************************************************************
Intersection #8 Lone Tree Way/Canada Valley Road
*******************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.646
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         64                Level Of Service:                  B
*******************************************************************************
Street Name:          Canada Valley Road                 Lone Tree Way
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:      0    0     0    0    0     0    0    0     0    0    0     0
Lanes:         2  0  0  1  1    1  0  1  0  1    1  0  3  0  1    2  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 5:00 - 6:00 PM
Base Vol:       84   55   173   175   56    22    54 1354    55   329  942   253
Growth 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
Initial Bse:    84   55   173   175   56    22    54 1354    55   329  942   253
Added Vol:      26    0    89     0    0     0     0  232    45   151  314     0
PasserByVol:     0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   110   55   262   175   56    22    54 1586   100   480 1256   253
User 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
PHF Adj:      0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96
PHF Volume:    115   57   273   182   58    23    56 1652   104   500 1308   264
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   115   57   273   182   58    23    56 1652   104   500 1308   264
RTOR Reduct:     0    0   273     0    0    23     0    0    63     0    0   182
RTOR Vol:      115   57     0   182   58     0    56 1652    41   500 1308    81
PCE 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
MLF 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
FinalVolume:   115   57     0   182   58     0    56 1652    41   500 1308    81
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:   0.91 1.00  0.91  1.00 1.00  1.00  1.00 1.00  1.00  0.91 1.00  1.00
Lanes:        2.00 1.00  1.00  1.00 1.00  1.00  1.00 3.00  1.00  2.00 3.00  1.00
Final Sat.:   3000 1650  1500  1650 1650  1650  1650 4950  1650  3000 4950  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.04 0.03  0.00  0.11 0.04  0.00  0.03 0.33  0.02  0.17 0.26  0.05
Crit Volume:          57         182                      551         250
Crit Moves:          ****       ****                     ****        ****
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                    Level Of Service Computation Report
                CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #9 Lone Tree Way/SB SR 4 Bypass Ramps
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.737
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):     xxxxxx
Optimal Cycle:         87               Level Of Service:                  C
********************************************************************************
Street Name:        SB SR 4 Bypass Ramps                 Lone Tree Way
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:       0  0  0  0  0   1  1  0  0  1   0  0  3  0  1   2  0  3  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 4:30 - 5:30 PM
Base Vol:      0    0     0  416   10   361    0 1169   541   98 1153     0
Growth 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
Initial Bse:   0    0     0  416   10   361    0 1169   541   98 1153     0
Added Vol:     0    0     0    0    0   178    0  250    71    0  287     0
PasserByVol:   0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:   0    0     0  416   10   539    0 1419   612   98 1440     0
User 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
PHF Adj:    0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
PHF Volume:    0    0     0  438   11   567    0 1494   644  103 1516     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0    0     0  438   11   567    0 1494   644  103 1516     0
RTOR Reduct:   0    0     0    0    0     0    0    0     0    0    0     0
RTOR Vol:      0    0     0  438   11   567    0 1494   644  103 1516     0
PCE 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
MLF 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
FinalVolume:   0    0     0  438   11   567    0 1494   644  103 1516     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment: 1.00 1.00  1.00 0.91 1.00  1.00 1.00 1.00  1.00 0.91 1.00  1.00
Lanes:      0.00 0.00  0.00 1.95 0.05  1.00 0.00 3.00  1.00 2.00 3.00  0.00
Final Sat.:    0    0     0 3054   81  1720    0 5160  1720 3127 5160     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.00 0.00  0.00 0.14 0.13  0.33 0.00 0.29  0.37 0.03 0.29  0.00
Crit Volume:   0                        567               644   52
Crit Moves:                            ****              ****  ****
********************************************************************************
```

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--------------------------------------------------------------------------------
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                     Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #10 Lone Tree Way/NB SR 4 Bypass Ramps
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.547
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         50                Level Of Service:                  A
********************************************************************************
Street Name:         NB SR 4 Bypass Ramps                  Lone Tree Way
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Split Phase      Split Phase       Protected        Protected
Rights:            Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:         1  1  0  0  1   0  0  0  0  0   0  0  3  0  1   1  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 May 2008 << 4:45 - 5:45 PM
Base Vol:     437   43   137     0    0     0     0 1404   264    21  831   357
Growth 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
Initial Bse:  437   43   137     0    0     0     0 1404   264    21  831   357
Added Vol:    104    0     0     0    0     0     0  136   114     0  183     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  541   43   137     0    0     0     0 1540   378    21 1014   357
User 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
PHF Adj:     0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91
PHF Volume:   595   47   151     0    0     0     0 1692   415    23 1114   392
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  595   47   151     0    0     0     0 1692   415    23 1114   392
RTOR Reduct:    0    0    23     0    0     0     0    0   327     0    0     0
RTOR Vol:     595   47   127     0    0     0     0 1692    88    23 1114   392
PCE 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
MLF 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
FinalVolume:  595   47   127     0    0     0     0 1692    88    23 1114   392
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720  1720 1720  1720  1720 1720  1720  1720 1720  1720
Adjustment:  0.91 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.85 0.15  1.00  0.00 0.00  0.00  0.00 3.00  1.00  1.00 3.00  1.00
Final Sat.:  2897  253  1720     0    0     0     0 5160  1720  1720 5160  1720
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.21 0.19  0.07  0.00 0.00  0.00  0.00 0.33  0.05  0.01 0.22  0.23
Crit Volume:  321                    0                 564          23
Crit Moves:  ****                                     ****        ****
********************************************************************************
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-------------------------------------------------------------------------------
                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
*******************************************************************************
Intersection #11 Lone Tree Way/Slatten Ranch Road
*******************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.546
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         50                Level Of Service:                  A
*******************************************************************************
Street Name:        Slatten Ranch Road                    Lone Tree Way
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        2  0  1  1  0    2  0  1  0  1    2  0  3  0  1    1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 22 May 2008 << 5:00 - 6:00 PM
Base Vol:      51   76   167   114   67   101   217  892   256   160  803    55
Growth 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
Initial Bse:   51   76   167   114   67   101   217  892   256   160  803    55
Added Vol:      0    0     0     0    0     0     0  136     0     0  183     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   51   76   167   114   67   101   217 1028   256   160  986    55
User 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
PHF Adj:     0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:    54   81   178   121   71   107   231 1094   272   170 1049    59
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   54   81   178   121   71   107   231 1094   272   170 1049    59
RTOR Reduct:    0    0     0     0    0   107     0    0    30     0    0    59
RTOR Vol:      54   81   178   121   71     0   231 1094   242   170 1049     0
PCE 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
MLF 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
FinalVolume:   54   81   178   121   71     0   231 1094   242   170 1049     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  0.91 1.00  1.00  0.91 1.00  1.00  0.91 1.00  1.00  1.00 1.00  1.00
Lanes:       2.00 1.00  1.00  2.00 1.00  1.00  2.00 3.00  1.00  1.00 2.00  1.00
Final Sat.:  3000 1650  1650  3000 1650  1650  3000 4950  1650  1650 3300  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02 0.05  0.11  0.04 0.04  0.00  0.08 0.22  0.15  0.10 0.32  0.00
Crit Volume:             178         71         115                     524
Crit Moves:             ****       ****        ****                    ****
*******************************************************************************
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Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #12 Lone Tree Way/Empire Avenue

Cycle (sec):	100	Critical Vol./Cap.(X):	0.641
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	64	Level Of Service:	B

Street Name:	Empire Avenue						Lone Tree Way					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2 0	1	0 1	2 0	1	1 0	1 0	3	0 1	1 0	2	0 1
Volume Module: >> Count Date: 22 May 2008 << 5:00 - 6:00 PM												
Base Vol:	76	46	36	231	115	176	230	759	112	53	702	129
Growth 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
Initial Bse:	76	46	36	231	115	176	230	759	112	53	702	129
Added Vol:	0	0	0	0	0	113	86	50	0	0	70	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	76	46	36	231	115	289	316	809	112	53	772	129
User 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
PHF Adj:	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
PHF Volume:	78	47	37	236	117	295	322	826	114	54	788	132
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	78	47	37	236	117	295	322	826	114	54	788	132
RTOR Reduct:	0	0	37	0	0	0	0	0	43	0	0	130
RTOR Vol:	78	47	0	236	117	295	322	826	72	54	788	2
PCE 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
MLF 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
FinalVolume:	78	47	0	236	117	295	322	826	72	54	788	2
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	1.00	1.00	2.00	1.00	1.00	1.00	3.00	1.00	1.00	2.00	1.00
Final Sat.:	3000	1650	1650	3000	1650	1650	1650	4950	1650	1650	3300	1650
Capacity Analysis Module:												
Vol/Sat:	0.03	0.03	0.00	0.08	0.07	0.18	0.20	0.17	0.04	0.03	0.24	0.00
Crit Volume:		47				295	322				394	
Crit Moves:		****				****	****				****	

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                        Level Of Service Computation Report
                    CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #13 Lone Tree Way/Deer Valley Road
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.725
Loss Time (sec):       0 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        83                Level Of Service:                  C
********************************************************************************
Street Name:         Deer Valley Road                   Lone Tree Way
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:        2  0  1  1  0    1  0  1  1  0    1  0  2  0  1    1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 5:00 - 6:00 PM
Base Vol:     192  365   168   168  191    14    87  780   147   151  497   154
Growth 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
Initial Bse:  192  365   168   168  191    14    87  780   147   151  497   154
Added Vol:     13    0    73     0    0     0     0  123    22    87   91     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  205  365   241   168  191    14    87  903   169   238  588   154
User 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
PHF Adj:     0.97 0.97  0.97  0.97 0.97  0.97  0.97 0.97  0.97  0.97 0.97  0.97
PHF Volume:   211  376   248   173  197    14    90  931   174   245  606   159
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  211  376   248   173  197    14    90  931   174   245  606   159
RTOR Reduct:    0    0     0     0    0     0     0    0   116     0    0   159
RTOR Vol:     211  376   248   173  197    14    90  931    58   245  606     0
PCE 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
MLF 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
FinalVolume:  211  376   248   173  197    14    90  931    58   245  606     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  0.91 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       2.00 1.20  0.80  1.00 1.86  0.14  1.00 2.00  1.00  1.00 2.00  1.00
Final Sat.:  3000 1988  1312  1650 3075   225  1650 3300  1650  1650 3300  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.07 0.19  0.19  0.10 0.06  0.06  0.05 0.28  0.04  0.15 0.18  0.00
Crit Volume:             312   173                     465         245
Crit Moves:             ****  ****                    ****        ****
********************************************************************************
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                      Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
*********************************************************************************
Intersection #14 Lone Tree Way/Hillcrest Avenue
*********************************************************************************
Cycle (sec):          100                 Critical Vol./Cap.(X):         0.632
Loss Time (sec):        0 (Y+R=4.0 sec)   Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         62                 Level Of Service:                  B
*********************************************************************************
Street Name:          Hillcrest Avenue                   Lone Tree Way
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Split Phase      Split Phase       Protected        Protected
Rights:            Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:         1  0  1  1  0    1  1  1  0  1    1  0  2  0  1    1  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 4:15 - 5:15 PM
Base Vol:      17   87    26   423   77    97   131  915    22    43  720   229
Growth 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
Initial Bse:   17   87    26   423   77    97   131  915    22    43  720   229
Added Vol:      0    0     0   128    0    56   101  114     0     0  148   140
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   17   87    26   551   77   153   232 1029    22    43  868   369
User 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
PHF Adj:     0.88 0.88  0.88  0.88 0.88  0.88  0.88 0.88  0.88  0.88 0.88  0.88
PHF Volume:    19   99    30   626   88   174   264 1169    25    49  986   419
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   19   99    30   626   88   174   264 1169    25    49  986   419
RTOR Reduct:    0    0     0     0    0   174     0    0    19     0    0   344
RTOR Vol:      19   99    30   626   88     0   264 1169     6    49  986    75
PCE 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
MLF 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
FinalVolume:   19   99    30   626   88     0   264 1169     6    49  986    75
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  0.91 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.54  0.46  2.00 1.00  1.00  1.00 2.00  1.00  1.00 3.00  1.00
Final Sat.:  1650 2541   759  3000 1650  1650  1650 3300  1650  1650 4950  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.04  0.04  0.21 0.05  0.00  0.16 0.35  0.00  0.03 0.20  0.05
Crit Volume:              64   313                    585          49
Crit Moves:             ****  ****                   ****        ****
*********************************************************************************
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                        Level Of Service Computation Report
                    CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #15 Lone Tree Way/Vista Grande Drive
********************************************************************************
Cycle (sec):           100               Critical Vol./Cap.(X):         0.489
Loss Time (sec):         0 (Y+R=4.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:          36               Level Of Service:                  A
********************************************************************************
Street Name:          Vista Grande Drive                    Lone Tree Way
Approach:       North Bound       South Bound       East Bound        West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted         Permitted         Protected         Protected
Rights:           Include           Include           Include           Include
Min. Green:     0     0     0     0     0     0     0     0     0     0     0     0
Lanes:        1  0  0  1  0    1  0  0  1  0    1  0  2  1  0    1  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 4:45 - 5:45 PM
Base Vol:      35    10   114    42     9    20    18  1282    44   121   931    24
Growth 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
Initial Bse:   35    10   114    42     9    20    18  1282    44   121   931    24
Added Vol:      0     0     0     0     0     0     0   260     0     0   291     0
PasserByVol:    0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:   35    10   114    42     9    20    18  1542    44   121  1222    24
User 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
PHF Adj:     0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97
PHF Volume:    36    10   118    43     9    21    19  1590    45   125  1260    25
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   36    10   118    43     9    21    19  1590    45   125  1260    25
RTOR Reduct:    0     0     0     0     0     0     0     0     0     0     0     0
RTOR Vol:      36    10   118    43     9    21    19  1590    45   125  1260    25
PCE 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
MLF 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
FinalVolume:   36    10   118    43     9    21    19  1590    45   125  1260    25
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720  1720  1720  1720  1720  1720  1720  1720  1720  1720  1720  1720
Adjustment:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:       1.00  0.08  0.92  1.00  0.31  0.69  1.00  2.92  0.08  1.00  2.94  0.06
Final Sat.:  1720   139  1581  1720   534  1186  1720  5017   143  1720  5061    99
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02  0.07  0.07  0.03  0.02  0.02  0.01  0.32  0.32  0.07  0.25  0.25
Crit Volume:        128         43                             545   125
Crit Moves:        ****        ****                            ****  ****
********************************************************************************
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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #16 Country Hills Drive/Hillcrest Avenue
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.363
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         36                Level Of Service:                  A
********************************************************************************
Street Name:          Hillcrest Avenue               Country Hills Drive
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        1  0  1  1  0   1  0  1  1  0   1  0  0  1  0   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 5:00 - 6:00 PM
Base Vol:       73  281    49   89  376    63   42   51    82   34   50    45
Growth 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
Initial Bse:    73  281    49   89  376    63   42   51    82   34   50    45
Added Vol:       0  233     0    0  167     0    0    0     0    0    0     0
PasserByVol:     0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:    73  514    49   89  543    63   42   51    82   34   50    45
User Adj:     0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92  0.92
PHF Adj:      0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92  0.92
PHF Volume:     73  514    49   89  543    63   42   51    82   34   50    45
Reduct Vol:      0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    73  514    49   89  543    63   42   51    82   34   50    45
RTOR Reduct:     0    0     0    0    0     0    0    0     0    0    0     0
RTOR Vol:       73  514    49   89  543    63   42   51    82   34   50    45
PCE 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
MLF 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
FinalVolume:    73  514    49   89  543    63   42   51    82   34   50    45
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650  1650
Adjustment:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:        1.00 1.83  0.17 1.00 1.79  0.21 1.00 0.38  0.62 1.00 0.53  0.47
Final Sat.:   1650 3013   287 1650 2957   343 1650  633  1017 1650  868   782
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.04 0.17  0.17 0.05 0.18  0.18 0.03 0.08  0.08 0.02 0.06  0.06
Crit Volume:         282        89                            133        95
Crit Moves:         ****      ****                           ****      ****
********************************************************************************
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                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
*********************************************************************************
Intersection #18 Laurell/Hillcrest
*********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):          0.287
Loss Time (sec):        0 (Y+R=4.0 sec) Average Delay (sec/veh):       xxxxxx
Optimal Cycle:         26               Level Of Service:                   A
*********************************************************************************
Street Name:          Hillcrest Avenue                    Laurel Road
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected         Permitted        Permitted
Rights:          Ignore           Include           Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:         1  0  2  0  1    1  0  1  1  0    1  0  0  1  0    1  0  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 5:00 - 6:00 PM
Base Vol:      27  302    39   162  459    50    17    7    22    35    9   133
Growth 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
Initial Bse:   27  302    39   162  459    50    17    7    22    35    9   133
Added Vol:      0  233     0     0  167     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   27  535    39   162  626    50    17    7    22    35    9   133
User Adj:    0.98 0.98  0.98  0.98 0.98  0.98  0.98 0.98  0.98  0.98 0.98  0.98
PHF Adj:     0.98 0.98  0.98  0.98 0.98  0.98  0.98 0.98  0.98  0.98 0.98  0.98
PHF Volume:    27  535    39   162  626    50    17    7    22    35    9   133
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   27  535    39   162  626    50    17    7    22    35    9   133
RTOR Reduct:    0    0     0     0    0     0     0    0     0     0    0   133
RTOR Vol:      27  535    39   162  626    50    17    7    22    35    9     0
PCE 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
MLF 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
FinalVolume:   27  535    39   162  626    50    17    7    22    35    9     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720  1720 1720  1720  1720 1720  1720  1720 1720  1720
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 2.00  1.00  1.00 1.85  0.15  1.00 0.24  0.76  1.00 1.00  1.00
Final Sat.:  1720 3440  1720  1720 3186   254  1720  415  1305  1720 1720  1720
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02 0.16  0.02  0.09 0.20  0.20  0.01 0.02  0.02  0.02 0.01  0.00
Crit Volume:       267         162                     29         35
Crit Moves:       ****        ****                   ****       ****
*********************************************************************************
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Near-Term With Project

FEHR & PEERS
TRANSPORTATION CONSULTANTS

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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #8 Lone Tree Way/Canada Valley Road
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):         0.586
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):     xxxxxx
Optimal Cycle:         55              Level Of Service:                  A
********************************************************************************
Street Name:          Canada Valley Road                  Lone Tree Way
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:         2  0  0  1  1   1  0  1  0  1   1  0  3  0  1   2  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 7:45 - 8:45 AM
Base Vol:      36   14    51  190   31    34   29  746    52  166 1005   168
Growth 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
Initial Bse:   36   14    51  190   31    34   29  746    52  166 1005   168
Added Vol:     40    0   133  196    0    60   20  225    13   45  114    65
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:   76   14   184  386   31    94   49  971    65  211 1119   233
User 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
PHF Adj:     0.90 0.90  0.90 0.90 0.90  0.90 0.90 0.90  0.90 0.90 0.90  0.90
PHF Volume:    84   16   204  429   34   104   54 1079    72  234 1243   259
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   84   16   204  429   34   104   54 1079    72  234 1243   259
RTOR Reduct:    0    0   129    0    0    54    0    0    46    0    0   259
RTOR Vol:      84   16    76  429   34    50   54 1079    26  234 1243     0
PCE 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
MLF 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
FinalVolume:   84   16    76  429   34    50   54 1079    26  234 1243     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650  1650
Adjustment:  0.91 1.00  0.91 1.00 1.00  1.00 1.00 1.00  1.00 0.91 1.00  1.00
Lanes:       2.00 0.34  1.66 1.00 1.00  1.00 1.00 3.00  1.00 2.00 3.00  1.00
Final Sat.:  3000  564  2487 1650 1650  1650 1650 4950  1650 3000 4950  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.03 0.03  0.03 0.26 0.02  0.03 0.03 0.22  0.02 0.08 0.25  0.00
Crit Volume:              46  429                      360         117
Crit Moves:             ****  ****                    ****        ****
********************************************************************************
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                      Level Of Service Computation Report
                   CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #9 Lone Tree Way/SB SR 4 Bypass Ramps
********************************************************************************
Cycle (sec):        100              Critical Vol./Cap.(X):        0.648
Loss Time (sec):      0 (Y+R=4.0 sec)  Average Delay (sec/veh):     xxxxxx
Optimal Cycle:       65              Level Of Service:                 B
********************************************************************************
Street Name:        SB SR 4 Bypass Ramps                  Lone Tree Way
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        0  0  0  0  0   1  1  0  0  1   0  0  3  0  1   2  0  3  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 7:45 - 8:45 AM
Base Vol:       0    0     0  287    6   353    0  571   401   72 1000     0
Growth 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
Initial Bse:    0    0     0  287    6   353    0  571   401   72 1000     0
Added Vol:      0    0     0    0    0    82    0  427   127    0  142     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:    0    0     0  287    6   435    0  998   528   72 1142     0
User 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
PHF Adj:     0.90 0.90  0.90 0.90 0.90  0.90 0.90 0.90  0.90 0.90 0.90  0.90
PHF Volume:     0    0     0  319    7   483    0 1109   587   80 1269     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0    0     0  319    7   483    0 1109   587   80 1269     0
RTOR Reduct:    0    0     0    0    0     0    0    0     0    0    0     0
RTOR Vol:       0    0     0  319    7   483    0 1109   587   80 1269     0
PCE 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
MLF 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
FinalVolume:    0    0     0  319    7   483    0 1109   587   80 1269     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:  1.00 1.00  1.00 0.91 1.00  1.00 1.00 1.00  1.00 0.91 1.00  1.00
Lanes:       0.00 0.00  0.00 1.96 0.04  1.00 0.00 3.00  1.00 2.00 3.00  0.00
Final Sat.:     0    0     0 3063   70  1720    0 5160  1720 3127 5160     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.10 0.09  0.28 0.00 0.21  0.34 0.03 0.25  0.00
Crit Volume:    0                        483               587   40
Crit Moves:                             ****              ****  ****
********************************************************************************
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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #10 Lone Tree Way/NB SR 4 Bypass Ramps
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):          0.360
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         36               Level Of Service:                   A
********************************************************************************
Street Name:        NB SR 4 Bypass Ramps                  Lone Tree Way
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:    0    0    0     0    0    0     0    0    0     0    0    0
Lanes:        1  1  0  0  1   0  0  0  0  0   0  0  3  0  1   1  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 May 2008 << 7:30 - 8:30 AM
Base Vol:     383   29   79     0    0    0     0  662  160     8  671  245
Growth 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
Initial Bse:  383   29   79     0    0    0     0  662  160     8  671  245
Added Vol:     50    0    0     0    0    0     0  205  222     0   92    0
PasserByVol:    0    0    0     0    0    0     0    0    0     0    0    0
Initial Fut:  433   29   79     0    0    0     0  867  382     8  763  245
User 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
PHF Adj:     0.89 0.89 0.89  0.89 0.89 0.89  0.89 0.89 0.89  0.89 0.89 0.89
PHF Volume:   487   33   89     0    0    0     0  974  429     9  857  275
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:  487   33   89     0    0    0     0  974  429     9  857  275
RTOR Reduct:    0    0    9     0    0    0     0    0  268     0    0    0
RTOR Vol:     487   33   80     0    0    0     0  974  162     9  857  275
PCE 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
MLF 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
FinalVolume:  487   33   80     0    0    0     0  974  162     9  857  275
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720
Adjustment:  0.91 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Lanes:       1.87 0.13 1.00  0.00 0.00 0.00  0.00 3.00 1.00  1.00 3.00 1.00
Final Sat.:  2931  216 1720     0    0    0     0 5160 1720  1720 5160 1720
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.17 0.15 0.05  0.00 0.00 0.00  0.00 0.19 0.09  0.01 0.17 0.16
Crit Volume:  260                    0             325           9
Crit Moves:  ****                                 ****        ****
********************************************************************************
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                        Level Of Service Computation Report
                    CCTALOS Method (Future Volume Alternative)
*********************************************************************************
Intersection #11 Lone Tree Way/Slatten Ranch Road
*********************************************************************************
Cycle (sec):          100                  Critical Vol./Cap.(X):          0.492
Loss Time (sec):        0 (Y+R=4.0 sec)    Average Delay (sec/veh):       xxxxxx
Optimal Cycle:         45                  Level Of Service:                   A
*********************************************************************************
Street Name:            Slatten Ranch Road                   Lone Tree Way
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Split Phase      Split Phase       Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0     0     0     0     0     0     0     0     0     0     0     0
Lanes:         2  0  1  1  0   2  0  1  0  1   2  0  3  0  1   1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 22 May 2008 << 7:15 - 8:15 AM
Base Vol:      39    47   191    42    35    24    74   484    91    54   837    29
Growth 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
Initial Bse:   39    47   191    42    35    24    74   484    91    54   837    29
Added Vol:      0     0     0     0     0     0     0   205     0     0    92     0
PasserByVol:    0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:   39    47   191    42    35    24    74   689    91    54   929    29
User 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
PHF Adj:     0.90  0.90  0.90  0.90  0.90  0.90  0.90  0.90  0.90  0.90  0.90  0.90
PHF Volume:    43    52   212    47    39    27    82   766   101    60  1032    32
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   43    52   212    47    39    27    82   766   101    60  1032    32
RTOR Reduct:    0     0     0     0     0    27     0     0    24     0     0    26
RTOR Vol:      43    52   212    47    39     0    82   766    77    60  1032     7
PCE 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
MLF 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
FinalVolume:   43    52   212    47    39     0    82   766    77    60  1032     7
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650  1650  1650  1650  1650  1650  1650  1650  1650  1650  1650  1650
Adjustment:  0.91  1.00  1.00  0.91  1.00  1.00  0.91  1.00  1.00  1.00  1.00  1.00
Lanes:       2.00  1.00  1.00  2.00  1.00  1.00  2.00  3.00  1.00  1.00  2.00  1.00
Final Sat.:  3000  1650  1650  3000  1650  1650  3000  4950  1650  1650  3300  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01  0.03  0.13  0.02  0.02  0.00  0.03  0.15  0.05  0.04  0.31  0.00
Crit Volume:              212          39          41                      516
Crit Moves:              ****        ****        ****                     ****
*********************************************************************************
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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #12 Lone Tree Way/Empire Avenue
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):          0.616
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         59              Level Of Service:                   B
********************************************************************************
Street Name:               Empire Avenue                  Lone Tree Way
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Split Phase      Split Phase       Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:         2  0  1  0  1    2  0  1  1  0    1  0  3  0  1    1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 22 May 2008 << 7:15 - 8:15 AM
Base Vol:       89    48    41   105    77   181   168   499    26    81   638    80
Growth 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
Initial Bse:    89    48    41   105    77   181   168   499    26    81   638    80
Added Vol:       0     0     0     0     0    57   124    81     0     0    35     0
PasserByVol:     0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:    89    48    41   105    77   238   292   580    26    81   673    80
User 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
PHF Adj:      0.90 0.90  0.90  0.90 0.90  0.90  0.90 0.90  0.90  0.90 0.90  0.90
PHF Volume:     99    53    46   117    86   264   324   644    29    90   748    89
Reduct Vol:      0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:    99    53    46   117    86   264   324   644    29    90   748    89
RTOR Reduct:     0     0    46     0     0     0     0     0    29     0     0    64
RTOR Vol:       99    53     0   117    86   264   324   644     0    90   748    25
PCE 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
MLF 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
FinalVolume:    99    53     0   117    86   264   324   644     0    90   748    25
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:   0.91 1.00  1.00  0.91 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:        2.00 1.00  1.00  2.00 1.00  1.00  1.00 3.00  1.00  1.00 2.00  1.00
Final Sat.:   3000 1650  1650  3000 1650  1650  1650 4950  1650  1650 3300  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.03 0.03  0.00  0.04 0.05  0.16  0.20 0.13  0.00  0.05 0.23  0.01
Crit Volume:    49                           264   324                    374
Crit Moves:   ****                          ****  ****                   ****
********************************************************************************
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                    Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
***************************************************************************
Intersection #13 Lone Tree Way/Deer Valley Road
***************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):        0.780
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        103                Level Of Service:                 C
***************************************************************************
Street Name:          Deer Valley Road                 Lone Tree Way
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:        2  0  1  1  0    1  0  1  1  0    1  0  2  0  1    1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 7:45 - 8:45 PM
Base Vol:     279  245   111   353  457    17    35  644   157   185  833   185
Growth 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
Initial Bse:  279  245   111   353  457    17    35  644   157   185  833   185
Added Vol:     19    0    63     0    0     0     0   65     7    43  148     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  298  245   174   353  457    17    35  709   164   228  981   185
User 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
PHF Adj:     0.89 0.89  0.89  0.89 0.89  0.89  0.89 0.89  0.89  0.89 0.89  0.89
PHF Volume:   335  275   196   397  513    19    39  797   184   256 1102   208
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  335  275   196   397  513    19    39  797   184   256 1102   208
RTOR Reduct:    0    0     0     0    0     0     0    0   184     0    0   208
RTOR Vol:     335  275   196   397  513    19    39  797     0   256 1102     0
PCE 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
MLF 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
FinalVolume:  335  275   196   397  513    19    39  797     0   256 1102     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  0.91 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       2.00 1.17  0.83  1.00 1.93  0.07  1.00 2.00  1.00  1.00 2.00  1.00
Final Sat.:  3000 1930  1370  1650 3182   118  1650 3300  1650  1650 3300  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.11 0.14  0.14  0.24 0.16  0.16  0.02 0.24  0.00  0.16 0.33  0.00
Crit Volume:             235   397                     398         256
Crit Moves:             ****  ****                    ****        ****
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                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
*******************************************************************************
Intersection #14 Lone Tree Way/Hillcrest Avenue
*******************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):         0.548
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):     xxxxxx
Optimal Cycle:         50              Level Of Service:                  A
*******************************************************************************
Street Name:          Hillcrest Avenue                   Lone Tree Way
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Split Phase      Split Phase       Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:         1  0  1  1  0   1  1  1  0  1   1  0  2  0  1   1  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 7:45 - 8:45 AM
Base Vol:       36   53    13   279   85   269   177  495    18    24  862   160
Growth 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
Initial Bse:    36   53    13   279   85   269   177  495    18    24  862   160
Added Vol:       0    0     0   126    0    60    41   86     0     0  150    53
PasserByVol:     0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    36   53    13   405   85   329   218  581    18    24 1012   213
User 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
PHF Adj:      0.90 0.90  0.90  0.90 0.90  0.90  0.90 0.90  0.90  0.90 0.90  0.90
PHF Volume:     40   59    14   450   94   366   242  646    20    27 1124   237
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    40   59    14   450   94   366   242  646    20    27 1124   237
RTOR Reduct:     0    0     0     0    0   242     0    0    20     0    0   237
RTOR Vol:       40   59    14   450   94   123   242  646     0    27 1124     0
PCE 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
MLF 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
FinalVolume:    40   59    14   450   94   123   242  646     0    27 1124     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:   1.00 1.00  1.00  0.91 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:        1.00 1.61  0.39  2.00 1.00  1.00  1.00 2.00  1.00  1.00 3.00  1.00
Final Sat.:   1650 2650   650  3000 1650  1650  1650 3300  1650  1650 4950  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.02 0.02  0.02  0.15 0.06  0.07  0.15 0.20  0.00  0.02 0.23  0.00
Crit Volume:    40               225               242                   375
Crit Moves:   ****              ****              ****                  ****
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                       Level Of Service Computation Report
                    CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #15 Lone Tree Way/Vista Grande Drive
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.367
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         29                Level Of Service:                  A
********************************************************************************
Street Name:          Vista Grande Drive                    Lone Tree Way
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        1  0  0  1  0   1  0  0  1  0   1  0  2  1  0   1  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 8:00 - 9:00 PM
Base Vol:     39   14   123   24   16    41   20  693    30   59  967    37
Growth 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
Initial Bse:  39   14   123   24   16    41   20  693    30   59  967    37
Added Vol:     0    0     0    0    0     0    0  211     0    0  212     0
PasserByVol:   0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:  39   14   123   24   16    41   20  904    30   59 1179    37
User 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
PHF Adj:    0.93 0.93  0.93 0.93 0.93  0.93 0.93 0.93  0.93 0.93 0.93  0.93
PHF Volume:   42   15   132   26   17    44   22  972    32   63 1268    40
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  42   15   132   26   17    44   22  972    32   63 1268    40
RTOR Reduct:   0    0     0    0    0     0    0    0     0    0    0     0
RTOR Vol:     42   15   132   26   17    44   22  972    32   63 1268    40
PCE 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
MLF 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
FinalVolume:  42   15   132   26   17    44   22  972    32   63 1268    40
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:      1.00 0.10  0.90 1.00 0.28  0.72 1.00 2.90  0.10 1.00 2.91  0.09
Final Sat.: 1720  176  1544 1720  483  1237 1720 4994   166 1720 5003   157
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.02 0.09  0.09 0.02 0.04  0.04 0.01 0.19  0.19 0.04 0.25  0.25
Crit Volume:      147         26               22                          436
Crit Moves:       ****       ****             ****                        ****
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                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
*******************************************************************************
Intersection #16 Country Hills Drive/Hillcrest Avenue
*******************************************************************************
Cycle (sec):          100                 Critical Vol./Cap.(X):         0.527
Loss Time (sec):        0 (Y+R=4.0 sec)   Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         48                 Level Of Service:                  A
*******************************************************************************
Street Name:          Hillcrest Avenue                Country Hills Drive
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Protected        Protected       Split Phase      Split Phase
Rights:            Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:         1  0  1  1  0   1  0  1  1  0   1  0  0  1  0   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 7:45 - 8:45 AM
Base Vol:      70  297    31    63  439    26    44   77   143    84   93   117
Growth 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
Initial Bse:   70  297    31    63  439    26    44   77   143    84   93   117
Added Vol:      0   87     0    15  184     0     0    0     0     0    0    45
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   70  384    31    78  623    26    44   77   143    84   93   162
User Adj:    0.83 0.83  0.83  0.83 0.83  0.83  0.83 0.83  0.83  0.83 0.83  0.83
PHF Adj:     0.83 0.83  0.83  0.83 0.83  0.83  0.83 0.83  0.83  0.83 0.83  0.83
PHF Volume:    70  384    31    78  623    26    44   77   143    84   93   162
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   70  384    31    78  623    26    44   77   143    84   93   162
RTOR Reduct:    0    0     0     0    0     0     0    0     0     0    0     0
RTOR Vol:      70  384    31    78  623    26    44   77   143    84   93   162
PCE 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
MLF 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
FinalVolume:   70  384    31    78  623    26    44   77   143    84   93   162
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.85  0.15  1.00 1.92  0.08  1.00 0.35  0.65  1.00 0.36  0.64
Final Sat.:  1650 3053   247  1650 3168   132  1650  578  1073  1650  602  1048
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.04 0.13  0.13  0.05 0.20  0.20  0.03 0.13  0.13  0.05 0.15  0.15
Crit Volume:   70                    325              220                    255
Crit Moves:  ****                   ****             ****                   ****
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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
*********************************************************************************
Intersection #18 Laurell/Hillcrest
*********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.409
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         31                Level Of Service:                  A
*********************************************************************************
Street Name:          Hillcrest Avenue                    Laurel Road
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected         Permitted        Permitted
Rights:           Ignore           Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:        1  0  2  0  1    1  0  1  1  0    1  0  0  1  0    1  0  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 7:45 - 8:45 AM
Base Vol:      67   372    25    74   377    80   150    50   100    48    67   155
Growth 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
Initial Bse:   67   372    25    74   377    80   150    50   100    48    67   155
Added Vol:      0   132     0     0   199     0     0     0     0     0     0     0
PasserByVol:    0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:   67   504    25    74   576    80   150    50   100    48    67   155
User 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
PHF Adj:     0.89  0.89  0.89  0.89  0.89  0.89  0.89  0.89  0.89  0.89  0.89  0.89
PHF Volume:    75   566    28    83   647    90   169    56   112    54    75   174
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   75   566    28    83   647    90   169    56   112    54    75   174
RTOR Reduct:    0     0     0     0     0     0     0     0     0     0     0    83
RTOR Vol:      75   566    28    83   647    90   169    56   112    54    75    91
PCE 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
MLF 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
FinalVolume:   75   566    28    83   647    90   169    56   112    54    75    91
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720  1720  1720  1720  1720  1720  1720  1720  1720  1720  1720  1720
Adjustment:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:       1.00  2.00  1.00  1.00  1.76  0.24  1.00  0.33  0.67  1.00  1.00  1.00
Final Sat.:  1720  3440  1720  1720  3020   420  1720   573  1147  1720  1720  1720
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.04  0.16  0.02  0.05  0.21  0.21  0.10  0.10  0.10  0.03  0.04  0.05
Crit Volume:   75                            369   169                          91
Crit Moves:  ****                           ****  ****                        ****
*********************************************************************************
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                   Level Of Service Computation Report
               CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #8 Lone Tree Way/Canada Valley Road
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.728
Loss Time (sec):        0 (Y+R=4.0 sec) Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         84               Level Of Service:                  C
********************************************************************************
Street Name:            Canada Valley Road                  Lone Tree Way
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Protected        Protected        Protected        Protected
Rights:            Include          Include          Include          Include
Min. Green:      0    0     0    0    0     0    0    0     0    0    0     0
Lanes:         2  0  0  1  1   1  0  1  0  1   1  0  3  0  1   2  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 5:00 - 6:00 PM
Base Vol:       84   55   173  175   56    22   54 1354    55  329  942   253
Growth 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
Initial Bse:    84   55   173  175   56    22   54 1354    55  329  942   253
Added Vol:      26    0    89  130    0    40   68  232    45  151  314   221
PasserByVol:     0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:   110   55   262  305   56    62  122 1586   100  480 1256   474
User 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
PHF Adj:      0.96 0.96  0.96 0.96 0.96  0.96 0.96 0.96  0.96 0.96 0.96  0.96
PHF Volume:    115   57   273  318   58    65  127 1652   104  500 1308   494
Reduct Vol:      0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   115   57   273  318   58    65  127 1652   104  500 1308   494
RTOR Reduct:     0    0   273    0    0    65    0    0    63    0    0   318
RTOR Vol:      115   57     0  318   58     0  127 1652    41  500 1308   176
PCE 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
MLF 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
FinalVolume:   115   57     0  318   58     0  127 1652    41  500 1308   176
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650  1650
Adjustment:   0.91 1.00  0.91 1.00 1.00  1.00 1.00 1.00  1.00 0.91 1.00  1.00
Lanes:        2.00 1.00  1.00 1.00 1.00  1.00 1.00 3.00  1.00 2.00 3.00  1.00
Final Sat.:   3000 1650  1500 1650 1650  1650 1650 4950  1650 3000 4950  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.04 0.03  0.00 0.19 0.04  0.00 0.08 0.33  0.02 0.17 0.26  0.11
Crit Volume:         57        318                   551        250
Crit Moves:        ****       ****                  ****       ****
********************************************************************************
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                      Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #9 Lone Tree Way/SB SR 4 Bypass Ramps
********************************************************************************
Cycle (sec):         100             Critical Vol./Cap.(X):          0.808
Loss Time (sec):       0 (Y+R=4.0 sec)  Average Delay (sec/veh):    xxxxxx
Optimal Cycle:       119             Level Of Service:                  D
********************************************************************************
Street Name:        SB SR 4 Bypass Ramps                 Lone Tree Way
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        0  0  0  0  0    1  1  0  0  1    0  0  3  0  1    2  0  3  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 4:30 - 5:30 PM
Base Vol:       0    0     0  416   10   361    0 1169   541   98 1153     0
Growth 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
Initial Bse:    0    0     0  416   10   361    0 1169   541   98 1153     0
Added Vol:      0    0     0    0    0   263    0  350   101    0  423     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:    0    0     0  416   10   624    0 1519   642   98 1576     0
User 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
PHF Adj:     0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
PHF Volume:     0    0     0  438   11   657    0 1599   676  103 1659     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0    0     0  438   11   657    0 1599   676  103 1659     0
RTOR Reduct:    0    0     0    0    0     0    0    0     0    0    0     0
RTOR Vol:       0    0     0  438   11   657    0 1599   676  103 1659     0
PCE 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
MLF 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
FinalVolume:    0    0     0  438   11   657    0 1599   676  103 1659     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:  1.00 1.00  1.00 0.91 1.00  1.00 1.00 1.00  1.00 0.91 1.00  1.00
Lanes:       0.00 0.00  0.00 1.95 0.05  1.00 0.00 3.00  1.00 2.00 3.00  0.00
Final Sat.:     0    0     0 3054   81  1720    0 5160  1720 3127 5160     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.14 0.13  0.38 0.00 0.31  0.39 0.03 0.32  0.00
Crit Volume:    0                       657               676   52
Crit Moves:                            ****              ****  ****
********************************************************************************
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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #10 Lone Tree Way/NB SR 4 Bypass Ramps
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):          0.575
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):     xxxxxx
Optimal Cycle:         54              Level Of Service:                   A
********************************************************************************
Street Name:         NB SR 4 Bypass Ramps               Lone Tree Way
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        1  1  0  0  1   0  0  0  0  0   0  0  3  0  1   1  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 May 2008 << 4:45 - 5:45 PM
Base Vol:     437   43   137    0    0     0    0 1404   264   21  831   357
Growth 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
Initial Bse:  437   43   137    0    0     0    0 1404   264   21  831   357
Added Vol:    155    0     0    0    0     0    0  186   164    0  268     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:  592   43   137    0    0     0    0 1590   428   21 1099   357
User 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
PHF Adj:     0.91 0.91  0.91 0.91 0.91  0.91 0.91 0.91  0.91 0.91 0.91  0.91
PHF Volume:   651   47   151    0    0     0    0 1747   470   23 1208   392
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  651   47   151    0    0     0    0 1747   470   23 1208   392
RTOR Reduct:    0    0    23    0    0     0    0    0   358    0    0     0
RTOR Vol:     651   47   127    0    0     0    0 1747   113   23 1208   392
PCE 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
MLF 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
FinalVolume:  651   47   127    0    0     0    0 1747   113   23 1208   392
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:  0.91 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       1.86 0.14  1.00 0.00 0.00  0.00 0.00 3.00  1.00 1.00 3.00  1.00
Final Sat.:  2915  233  1720    0    0     0    0 5160  1720 1720 5160  1720
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.22 0.20  0.07 0.00 0.00  0.00 0.00 0.34  0.07 0.01 0.23  0.23
Crit Volume:  349                   0                 582         23
Crit Moves:  ****                                    ****        ****
********************************************************************************
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                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #11 Lone Tree Way/Slatten Ranch Road
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.573
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):     xxxxxx
Optimal Cycle:         53               Level Of Service:                  A
********************************************************************************
Street Name:         Slatten Ranch Road                 Lone Tree Way
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        2  0  1  1  0   2  0  1  0  1   2  0  3  0  1   1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 22 May 2008 << 5:00 - 6:00 PM
Base Vol:     51   76   167  114   67   101  217  892   256  160  803    55
Growth 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
Initial Bse:  51   76   167  114   67   101  217  892   256  160  803    55
Added Vol:     0    0     0    0    0     0    0  186     0    0  268     0
PasserByVol:   0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:  51   76   167  114   67   101  217 1078   256  160 1071    55
User 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
PHF Adj:    0.94 0.94  0.94 0.94 0.94  0.94 0.94 0.94  0.94 0.94 0.94  0.94
PHF Volume:   54   81   178  121   71   107  231 1147   272  170 1139    59
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  54   81   178  121   71   107  231 1147   272  170 1139    59
RTOR Reduct:   0    0     0    0    0   107    0    0    30    0    0    59
RTOR Vol:     54   81   178  121   71     0  231 1147   242  170 1139     0
PCE 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
MLF 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
FinalVolume:  54   81   178  121   71     0  231 1147   242  170 1139     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650  1650
Adjustment: 0.91 1.00  1.00 0.91 1.00  1.00 0.91 1.00  1.00 1.00 1.00  1.00
Lanes:      2.00 1.00  1.00 2.00 1.00  1.00 2.00 3.00  1.00 1.00 2.00  1.00
Final Sat.: 3000 1650  1650 3000 1650  1650 3000 4950  1650 1650 3300  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.02 0.05  0.11 0.04 0.04  0.00 0.08 0.23  0.15 0.10 0.35  0.00
Crit Volume:            178        71         115                   570
Crit Moves:             ****       ****       ****                  ****
********************************************************************************
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                  Level Of Service Computation Report
               CCTALOS Method (Future Volume Alternative)
***************************************************************************
Intersection #12 Lone Tree Way/Empire Avenue
***************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):        0.702
Loss Time (sec):        0 (Y+R=4.0 sec) Average Delay (sec/veh):     xxxxxx
Optimal Cycle:         76               Level Of Service:                 C
***************************************************************************
Street Name:             Empire Avenue                  Lone Tree Way
Approach:      North Bound     South Bound      East Bound      West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase     Split Phase       Protected       Protected
Rights:          Include         Include          Include         Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        2  0  1  0  1   2  0  1  1  0   1  0  3  0  1   1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 22 May 2008 << 5:00 - 6:00 PM
Base Vol:     76   46    36  231  115   176  230  759   112   53  702   129
Growth 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
Initial Bse:  76   46    36  231  115   176  230  759   112   53  702   129
Added Vol:     0    0     0    0    0   164  116   70     0    0  104     0
PasserByVol:   0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:  76   46    36  231  115   340  346  829   112   53  806   129
User 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
PHF Adj:    0.98 0.98  0.98 0.98 0.98  0.98 0.98 0.98  0.98 0.98 0.98  0.98
PHF Volume:   78   47    37  236  117   347  353  846   114   54  822   132
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  78   47    37  236  117   347  353  846   114   54  822   132
RTOR Reduct:   0    0    37    0    0     0    0    0    43    0    0   130
RTOR Vol:     78   47     0  236  117   347  353  846    72   54  822     2
PCE 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
MLF 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
FinalVolume:  78   47     0  236  117   347  353  846    72   54  822     2
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650  1650
Adjustment: 0.91 1.00  1.00 0.91 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:      2.00 1.00  1.00 2.00 1.00  1.00 1.00 3.00  1.00 1.00 2.00  1.00
Final Sat.: 3000 1650  1650 3000 1650  1650 1650 4950  1650 1650 3300  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.03 0.03  0.00 0.08 0.07  0.21 0.21 0.17  0.04 0.03 0.25  0.00
Crit Volume:       47                   347  353                    411
Crit Moves:       ****                  **** ****                  ****
***************************************************************************
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                     Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #13 Lone Tree Way/Deer Valley Road
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):        0.746
Loss Time (sec):       0 (Y+R=4.0 sec)  Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        90                Level Of Service:                 C
********************************************************************************
Street Name:          Deer Valley Road                Lone Tree Way
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Protected        Protected        Protected        Protected
Rights:            Include          Include          Include          Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:         2  0  1  1  0    1  0  1  1  0    1  0  2  0  1    1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 5:00 - 6:00 PM
Base Vol:      192  365   168   168  191    14    87  780   147   151  497   154
Growth 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
Initial Bse:   192  365   168   168  191    14    87  780   147   151  497   154
Added Vol:      13    0    73     0    0     0     0  191    22    87  131     0
PasserByVol:     0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   205  365   241   168  191    14    87  971   169   238  628   154
User 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
PHF Adj:      0.97 0.97  0.97  0.97 0.97  0.97  0.97 0.97  0.97  0.97 0.97  0.97
PHF Volume:    211  376   248   173  197    14    90 1001   174   245  647   159
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   211  376   248   173  197    14    90 1001   174   245  647   159
RTOR Reduct:     0    0     0     0    0     0     0    0   116     0    0   159
RTOR Vol:      211  376   248   173  197    14    90 1001    58   245  647     0
PCE 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
MLF 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
FinalVolume:   211  376   248   173  197    14    90 1001    58   245  647     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:   0.91 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:        2.00 1.20  0.80  1.00 1.86  0.14  1.00 2.00  1.00  1.00 2.00  1.00
Final Sat.:   3000 1988  1312  1650 3075   225  1650 3300  1650  1650 3300  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.07 0.19  0.19  0.10 0.06  0.06  0.05 0.30  0.04  0.15 0.20  0.00
Crit Volume:              312   173                     501         245
Crit Moves:              ****  ****                    ****        ****
********************************************************************************
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                    Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
*******************************************************************************
Intersection #14 Lone Tree Way/Hillcrest Avenue
*******************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.655
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         66                Level Of Service:                  B
*******************************************************************************
Street Name:          Hillcrest Avenue                Lone Tree Way
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Split Phase      Split Phase       Protected        Protected
Rights:            Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:         1  0  1  1  0    1  1  1  0  1    1  0  2  0  1    1  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 4:15 - 5:15 PM
Base Vol:      17   87    26   423   77    97   131  915    22    43  720   229
Growth 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
Initial Bse:   17   87    26   423   77    97   131  915    22    43  720   229
Added Vol:      0    0     0   128    0    56   101  182     0     0  188   140
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   17   87    26   551   77   153   232 1097    22    43  908   369
User 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
PHF Adj:     0.88 0.88  0.88  0.88 0.88  0.88  0.88 0.88  0.88  0.88 0.88  0.88
PHF Volume:    19   99    30   626   88   174   264 1247    25    49 1032   419
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   19   99    30   626   88   174   264 1247    25    49 1032   419
RTOR Reduct:    0    0     0     0    0   174     0    0    19     0    0   344
RTOR Vol:      19   99    30   626   88     0   264 1247     6    49 1032    75
PCE 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
MLF 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
FinalVolume:   19   99    30   626   88     0   264 1247     6    49 1032    75
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  0.91 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.54  0.46  2.00 1.00  1.00  1.00 2.00  1.00  1.00 3.00  1.00
Final Sat.:  1650 2541   759  3000 1650  1650  1650 3300  1650  1650 4950  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.04  0.04  0.21 0.05  0.00  0.16 0.38  0.00  0.03 0.21  0.05
Crit Volume:              64   313                   623          49
Crit Moves:             ****  ****                  ****        ****
*******************************************************************************
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                    Level Of Service Computation Report
               CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #15 Lone Tree Way/Vista Grande Drive
********************************************************************************
Cycle (sec):         100               Critical Vol./Cap.(X):        0.502
Loss Time (sec):       0 (Y+R=4.0 sec) Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        37               Level Of Service:                 A
********************************************************************************
Street Name:         Vista Grande Drive                   Lone Tree Way
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:     0     0     0     0     0     0     0     0     0     0     0     0
Lanes:        1  0  0  1  0    1  0  0  1  0    1  0  2  1  0    1  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 4:45 - 5:45 PM
Base Vol:      35    10   114    42     9    20    18  1282    44   121   931    24
Growth 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
Initial Bse:   35    10   114    42     9    20    18  1282    44   121   931    24
Added Vol:      0     0     0     0     0     0     0   328     0     0   331     0
PasserByVol:    0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:   35    10   114    42     9    20    18  1610    44   121  1262    24
User 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
PHF Adj:     0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97
PHF Volume:    36    10   118    43     9    21    19  1660    45   125  1301    25
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   36    10   118    43     9    21    19  1660    45   125  1301    25
RTOR Reduct:    0     0     0     0     0     0     0     0     0     0     0     0
RTOR Vol:      36    10   118    43     9    21    19  1660    45   125  1301    25
PCE 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
MLF 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
FinalVolume:   36    10   118    43     9    21    19  1660    45   125  1301    25
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720  1720  1720  1720  1720  1720  1720  1720  1720  1720  1720  1720
Adjustment:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:       1.00  0.08  0.92  1.00  0.31  0.69  1.00  2.92  0.08  1.00  2.94  0.06
Final Sat.:  1720   139  1581  1720   534  1186  1720  5023   137  1720  5064    96
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02  0.07  0.07  0.03  0.02  0.02  0.01  0.33  0.33  0.07  0.26  0.26
Crit Volume:        128         43                      568         125
Crit Moves:        ****        ****                    ****        ****
********************************************************************************
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                  Level Of Service Computation Report
               CCTALOS Method (Future Volume Alternative)
*********************************************************************************
Intersection #16 Country Hills Drive/Hillcrest Avenue
*********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.412
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         39               Level Of Service:                  A
*********************************************************************************
Street Name:          Hillcrest Avenue               Country Hills Drive
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  0  1  0    1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 5:00 - 6:00 PM
Base Vol:      73   281    49    89   376    63    42    51    82    34    50    45
Growth 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
Initial Bse:   73   281    49    89   376    63    42    51    82    34    50    45
Added Vol:      0   233     0    51   167     0     0     0     0     0     0    30
PasserByVol:    0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:   73   514    49   140   543    63    42    51    82    34    50    75
User Adj:    0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.92
PHF Adj:     0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.92
PHF Volume:    73   514    49   140   543    63    42    51    82    34    50    75
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   73   514    49   140   543    63    42    51    82    34    50    75
RTOR Reduct:    0     0     0     0     0     0     0     0     0     0     0     0
RTOR Vol:      73   514    49   140   543    63    42    51    82    34    50    75
PCE 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
MLF 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
FinalVolume:   73   514    49   140   543    63    42    51    82    34    50    75
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650  1650  1650  1650  1650  1650  1650  1650  1650  1650  1650  1650
Adjustment:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:       1.00  1.83  0.17  1.00  1.79  0.21  1.00  0.38  0.62  1.00  0.40  0.60
Final Sat.:  1650  3013   287  1650  2957   343  1650   633  1017  1650   660   990
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.04  0.17  0.17  0.08  0.18  0.18  0.03  0.08  0.08  0.02  0.08  0.08
Crit Volume:        282         140                           133         125
Crit Moves:        ****        ****                          ****        ****
*********************************************************************************
```

```
---------------------------------------------------------------------------------
---------------------------------------------------------------------------------
                       Level Of Service Computation Report
                   CCTALOS Method (Future Volume Alternative)
*********************************************************************************
Intersection #18 Laurell/Hillcrest
*********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.296
Loss Time (sec):        0 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         26               Level Of Service:                  A
*********************************************************************************
Street Name:          Hillcrest Avenue                   Laurel Road
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Protected        Protected         Permitted         Permitted
Rights:            Ignore           Include          Include           Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:         1  0  2  0  1    1  0  1  1  0    1  0  0  1  0    1  0  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 15 May 2008 << 5:00 - 6:00 PM
Base Vol:      27  302    39   162  459    50    17    7    22    35    9   133
Growth 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
Initial Bse:   27  302    39   162  459    50    17    7    22    35    9   133
Added Vol:      0  263     0     0  218     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   27  565    39   162  677    50    17    7    22    35    9   133
User Adj:    0.98 0.98  0.98  0.98 0.98  0.98  0.98 0.98  0.98  0.98 0.98  0.98
PHF Adj:     0.98 0.98  0.98  0.98 0.98  0.98  0.98 0.98  0.98  0.98 0.98  0.98
PHF Volume:    27  565    39   162  677    50    17    7    22    35    9   133
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   27  565    39   162  677    50    17    7    22    35    9   133
RTOR Reduct:    0    0     0     0    0     0     0    0     0     0    0   133
RTOR Vol:      27  565    39   162  677    50    17    7    22    35    9     0
PCE 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
MLF 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
FinalVolume:   27  565    39   162  677    50    17    7    22    35    9     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720  1720 1720  1720  1720 1720  1720  1720 1720  1720
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 2.00  1.00  1.00 1.86  0.14  1.00 0.24  0.76  1.00 1.00  1.00
Final Sat.:  1720 3440  1720  1720 3203   237  1720  415  1305  1720 1720  1720
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02 0.16  0.02  0.09 0.21  0.21  0.01 0.02  0.02  0.02 0.01  0.00
Crit Volume:       283         162                     29         35
Crit Moves:        ****        ****                  ****       ****
*********************************************************************************
```

Cumulative No Project

FEHR & PEERS
TRANSPORTATION CONSULTANTS

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
=========================================================================
Condition: Antioch Davidon 2025 No Project AM Peak Hour         10/24/07
=========================================================================
INTERSECTION     1 Canada Valley/Laurel Road
Count Date                    Time                Peak Hour M
-------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                        3-PHASE SIGNAL
-----------             0    0    0
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT     0 ---  0.0   0.0  0.0  0.0   0.0 ---    0  RIGHT
                                                         STREET NAME:
THRU   953 ---> 2.1  (NO. OF LANES)   2.0<---  649  THRU  Laurel Road

RIGHT  100 ---  1.1   1.0  0.0  1.0   1.0 ---  238  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                      SIG WARRANTS:
W + E                 120    0  229                        Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Canada Valley
=========================================================================
               ORIGINAL   ADJUSTED                 V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
-------------------------------------------------------------------------
NB  RIGHT (R)     229          0 *     1720     0.0000
    LEFT (L)      120        120       1720     0.0698     0.0698
-------------------------------------------------------------------------
EB  RIGHT (R)     100        100       1720     0.0581
    THRU (T)      953        953       3440     0.2770
    T + R                   1053       3440     0.3061     0.3061
-------------------------------------------------------------------------
WB  THRU (T)      649        649       3440     0.1887
    LEFT (L)      238        238       1720     0.1384     0.1384
=========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                         0.51
     INTERSECTION LEVEL OF SERVICE:                             A
=========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025NP.AMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 No Project AM Peak Hour        10/24/07
========================================================================
INTERSECTION     2 Country Hills Dr/Laurel Road
Count Date                    Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                     8-PHASE SIGNAL
-----------            60   30   80
                        |    |    |
             ^          |    |    |         ^
             |       <---    v   --->       | Split? N
LEFT    40 ---  1.0   1.1  1.1  1.0   1.1 ---   30  RIGHT
                                                          STREET NAME:
THRU   679 ---> 2.1  (NO. OF LANES)   2.1<---  633  THRU  Laurel Road

RIGHT  420 ---  1.1   1.0  1.1  1.1   1.0 ---   62  LEFT
             |       <---    ^   --->       |
             v          |    |    |         v
  N                     |    |    |                       SIG WARRANTS:
W + E                 160   20  217                         Urb=Y, Rur=Y
  S                   LEFT THRU RIGHT Split? N

               STREET NAME: Country Hills Dr
========================================================================
               ORIGINAL   ADJUSTED               V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO      V/C
------------------------------------------------------------------------
NB  RIGHT (R)     217        217       1650     0.1315
    THRU (T)       20         20       1650     0.0121
    LEFT (L)      160        160       1650     0.0970
    T + R                    237       1650     0.1436     0.1436
------------------------------------------------------------------------
SB  RIGHT (R)      60         60       1650     0.0364
    THRU (T)       30         30       1650     0.0182
    LEFT (L)       80         80       1650     0.0485     0.0485
    T + R                     90       1650     0.0545
------------------------------------------------------------------------
EB  RIGHT (R)     420        420       1650     0.2545
    THRU (T)      679        679       3300     0.2058
    LEFT (L)       40         40       1650     0.0242
    T + R                   1099       3300     0.3330     0.3330
------------------------------------------------------------------------
WB  RIGHT (R)      30         30       1650     0.0182
    THRU (T)      633        633       3300     0.1918
    LEFT (L)       62         62       1650     0.0376     0.0376
    T + R                    663       3300     0.2009
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                           0.56
     INTERSECTION LEVEL OF SERVICE:                              A
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025NP.AMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
=========================================================================
Condition: Antioch Davidon 2025 No Project AM Peak Hour         10/24/07
=========================================================================
INTERSECTION     3 SR 4 Bypass SB/Laurel Road
Count Date                   Time                Peak Hour
-------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                           2-PHASE SIGNAL
-----------           300    0  840
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT     0 ---  0.0   1.0  1.1  2.1   0.0 ---    0  RIGHT
                                                      STREET NAME:
THRU   914 ---> 2.1  (NO. OF LANES)   2.0<---  420  THRU  Laurel Road

RIGHT   46 ---  1.1   0.0  0.0  0.0   0.0 ---    0  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                         SIG WARRANTS:
W + E                   0    0    0                           Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: SR 4 Bypass SB
=========================================================================
               ORIGINAL   ADJUSTED              V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO      V/C
-------------------------------------------------------------------------
SB  RIGHT (R)     300        300       1800     0.1667
    THRU (T)        0          0       1800     0.0000
    LEFT (L)      840        840       3273     0.2566     0.2566
    T + L                    840       3273     0.2566
-------------------------------------------------------------------------
EB  RIGHT (R)      46         46       1800     0.0256
    THRU (T)      914        914       3600     0.2539
    T + R                    960       3600     0.2667     0.2667
-------------------------------------------------------------------------
WB  THRU (T)      420        420       3600     0.1167
=========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                          0.52
     INTERSECTION LEVEL OF SERVICE:                              A
=========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025NP.AMV,CAPE=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 No Project AM Peak Hour         10/24/07
========================================================================
INTERSECTION     4 SR 4 Bypass NB/Laurel Road
Count Date                    Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                       3-PHASE SIGNAL
-----------             0    0    0
                        |    |    |
             ^          |    |    |         ^
             |       <---    v   --->       | Split? N
LEFT   140 ---  1.0   0.0  0.0  0.0   1.0 ---  620  RIGHT
                                                      STREET NAME:
THRU  1615 ---> 2.0  (NO. OF LANES)   2.0<---  565  THRU  Laurel Road

RIGHT    0 ---  0.0   1.1  1.1  1.0   0.0 ---    0  LEFT
             |       <---    ^   --->       |
             v          |    |    |         v
  N                     |    |    |                   SIG WARRANTS:
W + E                   5    0  100                     Urb=N, Rur=B
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: SR 4 Bypass NB
========================================================================
               ORIGINAL   ADJUSTED                V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
NB  RIGHT (R)     100        100       1720     0.0581     0.0581
    THRU (T)        0          0       1720     0.0000
    LEFT (L)        5          5       1720     0.0029
    T + L                      5       1720     0.0029
------------------------------------------------------------------------
EB  THRU (T)     1615       1615       3440     0.4695     0.4695
    LEFT (L)      140        140       1720     0.0814
------------------------------------------------------------------------
WB  RIGHT (R)     620        620       1720     0.3605
    THRU (T)      565        565       3440     0.1642
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                         0.53
     INTERSECTION LEVEL OF SERVICE:                            A
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025NP.AMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 No Project AM Peak Hour        10/24/07
========================================================================
INTERSECTION     5 Slatten Ranch/Laurel Road
Count Date                    Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                           8-PHASE SIGNAL
-----------            40  180  130
                        |    |    |
             ^          |    |    |         ^
             |       <---    v   --->       | Split? N
LEFT   160 ---  1.0   1.1  2.1  1.0   1.1 ---  320  RIGHT
                                                          STREET NAME:
THRU   925 ---> 3.0  (NO. OF LANES)   3.1<---  975  THRU  Laurel Road

RIGHT  630 ---  1.0   2.0  2.1  1.1   1.0 ---  260  LEFT
             |       <---    ^   --->       |
             v          |    |    |         v
  N                     |    |    |                       SIG WARRANTS:
W + E                 170  250  160                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Slatten Ranch
========================================================================
               ORIGINAL   ADJUSTED                V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
NB  RIGHT (R)     160         160       1650     0.0970
    THRU (T)      250         250       3300     0.0758
    LEFT (L)      170         170       3000     0.0567
    T + R                     410       3300     0.1242     0.1242
------------------------------------------------------------------------
SB  RIGHT (R)      40          40       1650     0.0242
    THRU (T)      180         180       3300     0.0545
    LEFT (L)      130         130       1650     0.0788     0.0788
    T + R                     220       3300     0.0667
------------------------------------------------------------------------
EB  RIGHT (R)     630         537 *     1650     0.3255     0.3255
    THRU (T)      925         925       4950     0.1869
    LEFT (L)      160         160       1650     0.0970
------------------------------------------------------------------------
WB  RIGHT (R)     320         320       1650     0.1939
    THRU (T)      975         975       4950     0.1970
    LEFT (L)      260         260       1650     0.1576     0.1576
    T + R                    1295       4950     0.2616
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                          0.69
     INTERSECTION LEVEL OF SERVICE:                              B
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025NP.AMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 No Project AM Peak Hour         10/24/07
========================================================================
INTERSECTION     6 Live Oak Ave/Laurel Road
Count Date                  Time               Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                         3-PHASE SIGNAL
-----------           310    0   60
                        |    |    |
             ^          |    |    |         ^
             |       <---    v   --->       | Split? N
LEFT   290 ---  2.0   1.0  0.0  1.0   1.1 ---   90  RIGHT
                                                            STREET NAME:
THRU   925 ---> 3.0  (NO. OF LANES)   3.1<--- 1245  THRU   Laurel Road

RIGHT    0 ---  0.0   0.0  0.0  0.0   0.0 ---    0  LEFT
             |       <---    ^   --->       |
             v          |    |    |         v
  N                     |    |    |                         SIG WARRANTS:
W + E                   0    0    0                           Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Live Oak Ave
========================================================================
               ORIGINAL   ADJUSTED                 V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
SB  RIGHT (R)     310        150 *     1720     0.0872     0.0872
    LEFT (L)       60         60       1720     0.0349
------------------------------------------------------------------------
EB  THRU (T)      925        925       5160     0.1793
    LEFT (L)      290        290       3127     0.0927     0.0927
------------------------------------------------------------------------
WB  RIGHT (R)      90         90       1720     0.0523
    THRU (T)     1245       1245       5160     0.2413
    T + R                   1335       5160     0.2587     0.2587
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                         0.44
     INTERSECTION LEVEL OF SERVICE:                             A
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025NP.AMV,CAP=
```

CCTALOS Software ver. 2.35 by TJKM Transportation Consultants

Condition: Antioch Davidon 2025 No Project AM Peak Hour 10/24/07

```
INTERSECTION     7 Empire Ave/Laurel Road
Count Date                   Time                Peak Hour
-------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                       8-PHASE SIGNAL
-----------           345  310   40
                        |    |    |
             ^          |    |    |         ^
             |       <---    v   --->       | Split? N
LEFT   285 ---  2.0   1.0  2.0  1.0   1.0 ---  140  RIGHT
                                                          STREET NAME:
THRU   650 ---> 2.0  (NO. OF LANES)   2.0<---  850  THRU  Laurel Road

RIGHT   50 ---  1.0   1.0  2.1  1.1   1.0 ---   70  LEFT
             |       <---    ^   --->       |
             v          |    |    |         v
  N                     |    |    |                       SIG WARRANTS:
W + E                 140  220   10                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Empire Ave
```

	MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	10	10	1650	0.0061	
	THRU (T)	220	220	3300	0.0667	
	LEFT (L)	140	140	1650	0.0848	0.0848
	T + R		230	3300	0.0697	
SB	RIGHT (R)	345	188 *	1650	0.1139	0.1139
	THRU (T)	310	310	3300	0.0939	
	LEFT (L)	40	40	1650	0.0242	
EB	RIGHT (R)	50	0 *	1650	0.0000	
	THRU (T)	650	650	3300	0.1970	
	LEFT (L)	285	285	3000	0.0950	0.0950
WB	RIGHT (R)	140	100 *	1650	0.0606	
	THRU (T)	850	850	3300	0.2576	0.2576
	LEFT (L)	70	70	1650	0.0424	

TOTAL VOLUME-TO-CAPACITY RATIO: 0.55

INTERSECTION LEVEL OF SERVICE: A

* ADJUSTED FOR RIGHT TURN ON RED

INT=2025.INT,VOL=2025NP.AMV,CAP=

CCTALOS Software ver. 2.35 by TJKM Transportation Consultants

Condition: Antioch Davidon 2025 No Project AM Peak Hour 10/24/07

```
===============================================================================
INTERSECTION     8 Canada Valley/Lone Tree Way
Count Date                   Time                 Peak Hour
-------------------------------------------------------------------------------
CCTA METHOD          RIGHT THRU LEFT                          8-PHASE SIGNAL
-----------             26   10  328
                         |    |    |
             ^           |    |    |         ^
             |       <---    v    --->       | Split? N
LEFT    42 ---  2.0   1.1  1.1  1.0   1.1 ---  249  RIGHT
                                                              STREET NAME:
THRU   950 ---> 3.0  (NO. OF LANES)   3.1<--- 1460  THRU  Lone Tree Way

RIGHT   20 ---  1.0   1.0  1.0  1.0   2.0 ---  260  LEFT
             |       <---    ^    --->       |
             v           |    |    |         v
  N                      |    |    |                      SIG WARRANTS:
W + E                   50   10  160                        Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Canada Valley
```

	MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	160	17 *	1650	0.0103	0.0103
	THRU (T)	10	10	1650	0.0061	
	LEFT (L)	50	50	1650	0.0303	
SB	RIGHT (R)	26	26	1650	0.0158	
	THRU (T)	10	10	1650	0.0061	
	LEFT (L)	328	328	1650	0.1988	0.1988
	T + R		36	1650	0.0218	
EB	RIGHT (R)	20	0 *	1650	0.0000	
	THRU (T)	950	950	4950	0.1919	
	LEFT (L)	42	42	3000	0.0140	0.0140
WB	RIGHT (R)	249	249	1650	0.1509	
	THRU (T)	1460	1460	4950	0.2949	
	LEFT (L)	260	260	3000	0.0867	
	T + R		1709	4950	0.3453	0.3453

TOTAL VOLUME-TO-CAPACITY RATIO: 0.57

INTERSECTION LEVEL OF SERVICE: A

* ADJUSTED FOR RIGHT TURN ON RED

INT=2025.INT,VOL=2025NP.AMV,CAP=

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
=========================================================================
Condition: Antioch Davidon 2025 No Project AM Peak Hour         10/24/07
=========================================================================
INTERSECTION     9 SR 4 Bypass SB/Lone Tree Way
Count Date                  Time                Peak Hour
-------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                             3-PHASE SIGNAL
-----------           200    0  723
                        |    |    |
             ^          |    |    |         ^
             |       <---    v   --->       | Split? N
LEFT     0 ---  0.0   1.0  1.1  2.1   0.0 ---    0  RIGHT
                                                        STREET NAME:
THRU  1156 ---> 3.0  (NO. OF LANES)   3.0<--- 1769  THRU  Lone Tree Way

RIGHT  282 ---  1.0   0.0  0.0  0.0   2.0 ---  160  LEFT
             |       <---    ^   --->       |
             v          |    |    |         v
  N                     |    |    |                     SIG WARRANTS:
W + E                   0    0    0                       Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: SR 4 Bypass SB
=========================================================================
               ORIGINAL   ADJUSTED                 V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
-------------------------------------------------------------------------
SB  RIGHT (R)     200         200       1720     0.1163
    THRU (T)        0           0       1720     0.0000
    LEFT (L)      723         723       3127     0.2312     0.2312
    T + L                     723       3127     0.2312
-------------------------------------------------------------------------
EB  RIGHT (R)     282         282       1720     0.1640
    THRU (T)     1156        1156       5160     0.2240
-------------------------------------------------------------------------
WB  THRU (T)     1769        1769       5160     0.3428     0.3428
    LEFT (L)      160         160       3127     0.0512
=========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                          0.57
     INTERSECTION LEVEL OF SERVICE:                              A
=========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025NP.AMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 No Project AM Peak Hour        10/24/07
========================================================================
INTERSECTION    10 SR 4 Bypass NB/Lone Tree Way
Count Date                   Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                       3-PHASE SIGNAL
-----------             0    0    0
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT     0 ---  0.0   0.0  0.0  0.0   1.0 ---  714  RIGHT
                                                          STREET NAME:
THRU  1580 ---> 3.0  (NO. OF LANES)   3.0<--- 1655  THRU  Lone Tree Way

RIGHT  300 ---  1.0   2.0  1.0  1.0   2.0 ---   70  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                       SIG WARRANTS:
W + E                 274   10  250                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: SR 4 Bypass NB
========================================================================
               ORIGINAL   ADJUSTED                V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO      V/C
------------------------------------------------------------------------
NB  RIGHT (R)     250        211 *     1720     0.1227     0.1227
    THRU (T)       10         10       1720     0.0058
    LEFT (L)      274        274       3127     0.0876
------------------------------------------------------------------------
EB  RIGHT (R)     300        149 *     1720     0.0866
    THRU (T)     1580       1580       5160     0.3062
------------------------------------------------------------------------
WB  RIGHT (R)     714        714       1720     0.4151     0.4151
    THRU (T)     1655       1655       5160     0.3207
    LEFT (L)       70         70       3127     0.0224
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                         0.54
     INTERSECTION LEVEL OF SERVICE:                             A
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025NP.AMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
=========================================================================
Condition: Antioch Davidon 2025 No Project AM Peak Hour        10/24/07
=========================================================================
INTERSECTION    11 Slatten Ranch/Lone Tree Way
Count Date                   Time               Peak Hour
-------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                         8-PHASE SIGNAL
-----------           280  150   10
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT   460 ---  2.0   1.0  2.0  2.0   1.1 ---   50  RIGHT
                                                            STREET NAME:
THRU  1110 ---> 3.0  (NO. OF LANES)   3.1<--- 1690  THRU  Lone Tree Way

RIGHT  240 ---  1.0   2.0  2.1  1.1   1.0 ---   70  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                         SIG WARRANTS:
W + E                 500  500   30                           Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Slatten Ranch
=========================================================================
               ORIGINAL   ADJUSTED               V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO      V/C
-------------------------------------------------------------------------
NB  RIGHT (R)      30          30       1650     0.0182
    THRU (T)      500         500       3300     0.1515
    LEFT (L)      500         500       3000     0.1667     0.1667
    T + R                     530       3300     0.1606
-------------------------------------------------------------------------
SB  RIGHT (R)     280          27 *     1650     0.0164
    THRU (T)      150         150       3300     0.0455     0.0455
    LEFT (L)       10          10       3000     0.0033
-------------------------------------------------------------------------
EB  RIGHT (R)     240           0 *     1650     0.0000
    THRU (T)     1110        1110       4950     0.2242
    LEFT (L)      460         460       3000     0.1533     0.1533
-------------------------------------------------------------------------
WB  RIGHT (R)      50          50       1650     0.0303
    THRU (T)     1690        1690       4950     0.3414
    LEFT (L)       70          70       1650     0.0424
    T + R                    1740       4950     0.3515     0.3515
=========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                           0.72
     INTERSECTION LEVEL OF SERVICE:                               C
=========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025NP.AMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 No Project AM Peak Hour         10/24/07
========================================================================
INTERSECTION    12 Empire Ave/Lone Tree Way
Count Date                   Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                       8-PHASE SIGNAL
-----------           100   90   90
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT   220 ---  1.0   1.1  2.1  1.0   1.0 ---  340  RIGHT
                                                          STREET NAME:
THRU   680 ---> 3.0  (NO. OF LANES)   3.0<--- 1200  THRU  Lone Tree Way

RIGHT  260 ---  1.0   2.0  1.0  1.0   1.0 ---   30  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                       SIG WARRANTS:
W + E                 510  200   20                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Empire Ave
========================================================================
               ORIGINAL   ADJUSTED                V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO      V/C
------------------------------------------------------------------------
NB  RIGHT (R)      20          0 *     1650     0.0000
    THRU (T)      200        200       1650     0.1212
    LEFT (L)      510        510       3000     0.1700     0.1700
------------------------------------------------------------------------
SB  RIGHT (R)     100        100       1650     0.0606     0.0606
    THRU (T)       90         90       3300     0.0273
    LEFT (L)       90         90       1650     0.0545
    T + R                    190       3300     0.0576
------------------------------------------------------------------------
EB  RIGHT (R)     260          0 *     1650     0.0000
    THRU (T)      680        680       4950     0.1374
    LEFT (L)      220        220       1650     0.1333     0.1333
------------------------------------------------------------------------
WB  RIGHT (R)     340        250 *     1650     0.1515
    THRU (T)     1200       1200       4950     0.2424     0.2424
    LEFT (L)       30         30       1650     0.0182
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                         0.61
     INTERSECTION LEVEL OF SERVICE:                            B
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025NP.AMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 No Project AM Peak Hour        10/24/07
========================================================================
INTERSECTION    13 Deer Valley Rd/Lone Tree Way
Count Date                    Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                            8-PHASE SIGNAL
-----------           100  380  340
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT   110 ---  1.0   1.1  2.1  1.0   1.1 ---  360  RIGHT
                                                      STREET NAME:
THRU   700 ---> 3.1  (NO. OF LANES)   3.1<--- 1320  THRU  Lone Tree Way

RIGHT  160 ---  1.1   2.0  2.1  1.1   1.0 ---  200  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                   SIG WARRANTS:
W + E                 450  520  220                     Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Deer Valley Rd
========================================================================
               ORIGINAL   ADJUSTED                V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
NB  RIGHT (R)     220        220        1650     0.1333
    THRU (T)      520        520        3300     0.1576
    LEFT (L)      450        450        3000     0.1500
    T + R                    740        3300     0.2242     0.2242
------------------------------------------------------------------------
SB  RIGHT (R)     100        100        1650     0.0606
    THRU (T)      380        380        3300     0.1152
    LEFT (L)      340        340        1650     0.2061     0.2061
    T + R                    480        3300     0.1455
------------------------------------------------------------------------
EB  RIGHT (R)     160        160        1650     0.0970
    THRU (T)      700        700        4950     0.1414
    LEFT (L)      110        110        1650     0.0667     0.0667
    T + R                    860        4950     0.1737
------------------------------------------------------------------------
WB  RIGHT (R)     360        360        1650     0.2182
    THRU (T)     1320       1320        4950     0.2667
    LEFT (L)      200        200        1650     0.1212
    T + R                   1680        4950     0.3394     0.3394
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                          0.84
     INTERSECTION LEVEL OF SERVICE:                             D
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025NP.AMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
=========================================================================
Condition: Antioch Davidon 2025 No Project AM Peak Hour        10/24/07
=========================================================================
INTERSECTION    14 Hillcrest Ave/Lone Tree Way
Count Date                   Time                Peak Hour
-------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                           8-PHASE SIGNAL
-----------           464   40  380
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT   288 ---  1.0   1.0  2.1  2.1   1.0 ---  400  RIGHT
                                                          STREET NAME:
THRU   792 ---> 3.1  (NO. OF LANES)   3.0<--- 1256  THRU  Lone Tree Way

RIGHT   30 ---  1.1   1.0  2.1  1.1   1.0 ---   40  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                       SIG WARRANTS:
W + E                  80   70   80                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? Y

               STREET NAME: Hillcrest Ave
=========================================================================
               ORIGINAL   ADJUSTED              V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO      V/C
-------------------------------------------------------------------------
NB  RIGHT (R)      80          80       1650     0.0485     0.0485
    THRU (T)       70          70       3300     0.0212
    LEFT (L)       80          80       1650     0.0485
    T + R                     150       3300     0.0455
-------------------------------------------------------------------------
SB  RIGHT (R)     464         176 *     1650     0.1067
    THRU (T)       40          40       3300     0.0121
    LEFT (L)      380         380       3000     0.1267     0.1267
    T + L                     420       4650     0.0903
-------------------------------------------------------------------------
EB  RIGHT (R)      30          30       1650     0.0182
    THRU (T)      792         792       4950     0.1600
    LEFT (L)      288         288       1650     0.1745     0.1745
    T + R                     822       4950     0.1661
-------------------------------------------------------------------------
WB  RIGHT (R)     400         191 *     1650     0.1158
    THRU (T)     1256        1256       4950     0.2537     0.2537
    LEFT (L)       40          40       1650     0.0242
=========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                          0.60
     INTERSECTION LEVEL OF SERVICE:                             A
=========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025NP.AMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 No Project AM Peak Hour         10/24/07
========================================================================
INTERSECTION    15 Vista Grande Dr/Lone Tree Way
Count Date                   Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                          5-PHASE SIGNAL
-----------           60   20   70
                       |    |    |
             ^         |    |    |         ^
             |       <---   v   --->       | Split? N
LEFT   110 ---  1.0   1.1  1.1  1.0   1.0 ---  140  RIGHT
                                                          STREET NAME:
THRU   892 ---> 3.0  (NO. OF LANES)   3.0<--- 1316  THRU  Lone Tree Way

RIGHT  220 ---  1.0   1.0  1.0  1.0   1.0 ---  170  LEFT
             |       <---   ^   --->       |
             v         |    |    |         v
  N                    |    |    |                        SIG WARRANTS:
W + E                 300   20  130                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Vista Grande Dr
========================================================================
               ORIGINAL   ADJUSTED                V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
NB  RIGHT (R)     130           0 *     1650     0.0000
    THRU (T)       20          20       1650     0.0121
    LEFT (L)      300         300       1650     0.1818     0.1818
------------------------------------------------------------------------
SB  RIGHT (R)      60          60       1650     0.0364
    THRU (T)       20          20       1650     0.0121
    LEFT (L)       70          70       1650     0.0424
    T + R                      80       1650     0.0485     0.0485
------------------------------------------------------------------------
EB  RIGHT (R)     220           0 *     1650     0.0000
    THRU (T)      892         892       4950     0.1802
    LEFT (L)      110         110       1650     0.0667     0.0667
------------------------------------------------------------------------
WB  RIGHT (R)     140          70 *     1650     0.0424
    THRU (T)     1316        1316       4950     0.2659     0.2659
    LEFT (L)      170         170       1650     0.1030
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                          0.56
     INTERSECTION LEVEL OF SERVICE:                              A
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025NP.AMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 No Project AM Peak Hour        10/24/07
========================================================================
INTERSECTION    16 Hillcrest/Country Hills
Count Date                   Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                       8-PHASE SIGNAL
-----------            30  734   80
                        |   |   |
             ^          |   |   |         ^
             |       <---   v   --->      | Split? N
LEFT    70 ---  1.0   1.1  2.1  1.0   1.1 ---   60  RIGHT
                                                          STREET NAME:
THRU    40 ---> 1.0  (NO. OF LANES)   1.1<---   60  THRU  Country Hills

RIGHT   50 ---  1.0   1.0  2.1  1.1   1.0 ---  110  LEFT
             |       <---   ^   --->      |
             v          |   |   |         v
  N                     |   |   |                         SIG WARRANTS:
W + E                 100  708  150                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Hillcrest
========================================================================
               ORIGINAL   ADJUSTED                  V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
NB  RIGHT (R)     150        150       1650     0.0909
    THRU (T)      708        708       3300     0.2145
    LEFT (L)      100        100       1650     0.0606
    T + R                    858       3300     0.2600     0.2600
------------------------------------------------------------------------
SB  RIGHT (R)      30         30       1650     0.0182
    THRU (T)      734        734       3300     0.2224
    LEFT (L)       80         80       1650     0.0485     0.0485
    T + R                    764       3300     0.2315
------------------------------------------------------------------------
EB  RIGHT (R)      50          0 *     1650     0.0000
    THRU (T)       40         40       1650     0.0242
    LEFT (L)       70         70       1650     0.0424     0.0424
------------------------------------------------------------------------
WB  RIGHT (R)      60         60       1650     0.0364
    THRU (T)       60         60       1650     0.0364
    LEFT (L)      110        110       1650     0.0667
    T + R                    120       1650     0.0727     0.0727
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                          0.42
     INTERSECTION LEVEL OF SERVICE:                              A
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025NP.AMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
=========================================================================
Condition: Antioch Davidon 2025 No Project AM Peak Hour         10/24/07
=========================================================================
INTERSECTION    18 Hillcrest/Laurel
Count Date                   Time                Peak Hour
-------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                       8-PHASE SIGNAL
-----------           120  860  315
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT   170 ---  1.0   1.1  2.1  1.0   1.0 ---  195  RIGHT
                                                          STREET NAME:
THRU    90 ---> 1.1  (NO. OF LANES)   1.0<---  100  THRU  Laurel

RIGHT  110 ---  1.1   1.0  2.1  1.1   1.0 ---  254  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                       SIG WARRANTS:
W + E                  90  900  358                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Hillcrest
=========================================================================
               ORIGINAL   ADJUSTED                  V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
-------------------------------------------------------------------------
NB  RIGHT (R)     358         358        1650     0.2170
    THRU (T)      900         900        3300     0.2727
    LEFT (L)       90          90        1650     0.0545
    T + R                    1258        3300     0.3812     0.3812
-------------------------------------------------------------------------
SB  RIGHT (R)     120         120        1650     0.0727
    THRU (T)      860         860        3300     0.2606
    LEFT (L)      315         315        1650     0.1909     0.1909
    T + R                     980        3300     0.2970
-------------------------------------------------------------------------
EB  RIGHT (R)     110         110        1650     0.0667
    THRU (T)       90          90        1650     0.0545
    LEFT (L)      170         170        1650     0.1030
    T + R                     200        1650     0.1212     0.1212
-------------------------------------------------------------------------
WB  RIGHT (R)     195           0 *      1650     0.0000
    THRU (T)      100         100        1650     0.0606
    LEFT (L)      254         254        1650     0.1539     0.1539
=========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                           0.85
     INTERSECTION LEVEL OF SERVICE:                              D
=========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025NP.AMV,CAP=
```

CCTALOS Software ver. 2.35 by TJKM Transportation Consultants

Condition: Antioch Davidon 2025 No Project PM Peak Hour 10/24/07

INTERSECTION 1 Canada Valley/Laurel Road
Count Date Time Peak Hour

```
CCTA METHOD          RIGHT THRU LEFT                       3-PHASE SIGNAL
-----------              0    0    0
                         |    |    |
             ^           |    |    |         ^
             |       <---    v   --->        | Split? N
LEFT     0 ---  0.0   0.0  0.0  0.0   0.0 ---    0  RIGHT
                                                            STREET NAME:
THRU   566 ---> 2.1  (NO. OF LANES)   2.0<---  836  THRU   Laurel Road

RIGHT  150 ---  1.1   1.0  0.0  1.0   1.0 ---  421  LEFT
             |       <---    ^   --->        |
             v           |    |    |         v
  N                      |    |    |                        SIG WARRANTS:
W + E                   40    0  278                          Urb=Y, Rur=Y
  S                    LEFT THRU RIGHT Split? N

               STREET NAME: Canada Valley
```

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB RIGHT (R)	278	0 *	1720	0.0000	
LEFT (L)	40	40	1720	0.0233	0.0233
EB RIGHT (R)	150	150	1720	0.0872	
THRU (T)	566	566	3440	0.1645	
T + R		716	3440	0.2081	0.2081
WB THRU (T)	836	836	3440	0.2430	
LEFT (L)	421	421	1720	0.2448	0.2448

TOTAL VOLUME-TO-CAPACITY RATIO: 0.48
INTERSECTION LEVEL OF SERVICE: A

* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025NP.PMV,CAP=

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
=========================================================================
Condition: Antioch Davidon 2025 No Project PM Peak Hour        10/24/07
=========================================================================
INTERSECTION     2 Country Hills Dr/Laurel Road
Count Date                   Time              Peak Hour
-------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                        8-PHASE SIGNAL
-----------            40   20   50
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT    60 ---  1.0   1.1  1.1  1.0   1.1 ---  100  RIGHT
                                                           STREET NAME:
THRU   636 ---> 2.1  (NO. OF LANES)   2.1<--- 1078  THRU  Laurel Road

RIGHT  120 ---  1.1   1.0  1.1  1.1   1.0 ---  182  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                        SIG WARRANTS:
W + E                  90    0   95                          Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Country Hills Dr
=========================================================================
```

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB RIGHT (R)	95	95	1650	0.0576	
THRU (T)	0	0	1650	0.0000	
LEFT (L)	90	90	1650	0.0545	0.0545
T + R		95	1650	0.0576	
SB RIGHT (R)	40	40	1650	0.0242	
THRU (T)	20	20	1650	0.0121	
LEFT (L)	50	50	1650	0.0303	
T + R		60	1650	0.0364	0.0364
EB RIGHT (R)	120	120	1650	0.0727	
THRU (T)	636	636	3300	0.1927	
LEFT (L)	60	60	1650	0.0364	0.0364
T + R		756	3300	0.2291	
WB RIGHT (R)	100	100	1650	0.0606	
THRU (T)	1078	1078	3300	0.3267	
LEFT (L)	182	182	1650	0.1103	
T + R		1178	3300	0.3570	0.3570

```
=========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                              0.48
     INTERSECTION LEVEL OF SERVICE:                                  A
=========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025NP.PMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
=========================================================================
Condition: Antioch Davidon 2025 No Project PM Peak Hour        10/24/07
=========================================================================
INTERSECTION     3 SR 4 Bypass SB/Laurel Road
Count Date                    Time                Peak Hour
-------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                           2-PHASE SIGNAL
-----------           471    0  720
                         |    |    |
             ^           |    |    |         ^
             |       <---    v   --->       | Split? N
LEFT     0 ---  0.0   1.0  1.1  2.1   0.0 ---    0  RIGHT
                                                      STREET NAME:
THRU   770 ---> 2.1  (NO. OF LANES)   2.0<---  890  THRU  Laurel Road

RIGHT   11 ---  1.1   0.0  0.0  0.0   0.0 ---    0  LEFT
             |       <---    ^   --->       |
             v           |    |    |         v
  N                      |    |    |                      SIG WARRANTS:
W + E                    0    0    0                        Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: SR 4 Bypass SB
=========================================================================
               ORIGINAL   ADJUSTED                V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
-------------------------------------------------------------------------
SB  RIGHT (R)     471         471       1800     0.2617     0.2617
    THRU (T)        0           0       1800     0.0000
    LEFT (L)      720         720       3273     0.2200
    T + L                     720       3273     0.2200
-------------------------------------------------------------------------
EB  RIGHT (R)      11          11       1800     0.0061
    THRU (T)      770         770       3600     0.2139
    T + R                     781       3600     0.2169
-------------------------------------------------------------------------
WB  THRU (T)      890         890       3600     0.2472     0.2472
=========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                           0.51
     INTERSECTION LEVEL OF SERVICE:                              A
=========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025NP.PMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 No Project PM Peak Hour        10/24/07
========================================================================
INTERSECTION     4 SR 4 Bypass NB/Laurel Road
Count Date                    Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                       3-PHASE SIGNAL
-----------             0    0    0
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT   150 ---  1.0   0.0  0.0  0.0   1.0 ---  730  RIGHT
                                                          STREET NAME:
THRU  1340 ---> 2.0  (NO. OF LANES)   2.0<---  959  THRU  Laurel Road

RIGHT    0 ---  0.0   1.1  1.1  1.0   0.0 ---    0  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                       SIG WARRANTS:
W + E                  41    0  210                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: SR 4 Bypass NB
========================================================================
               ORIGINAL   ADJUSTED                V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
NB  RIGHT (R)     210        210       1720     0.1221     0.1221
    THRU (T)        0          0       1720     0.0000
    LEFT (L)       41         41       1720     0.0238
    T + L                     41       1720     0.0238
------------------------------------------------------------------------
EB  THRU (T)     1340       1340       3440     0.3895
    LEFT (L)      150        150       1720     0.0872     0.0872
------------------------------------------------------------------------
WB  RIGHT (R)     730        730       1720     0.4244     0.4244
    THRU (T)      959        959       3440     0.2788
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                         0.63
     INTERSECTION LEVEL OF SERVICE:                             B
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025NP.PMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 No Project PM Peak Hour         10/24/07
========================================================================
INTERSECTION     5 Slatten Ranch/Laurel Road
Count Date                  Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                       8-PHASE SIGNAL
-----------           110  410  230
                        |   |   |
             ^          |   |   |         ^
             |       <---   v   --->      | Split? N
LEFT   100 ---  1.0   1.1  2.1  1.0   1.1 ---  220  RIGHT
                                                          STREET NAME:
THRU  1160 ---> 3.0  (NO. OF LANES)   3.1<---  969  THRU  Laurel Road

RIGHT  290 ---  1.0   2.0  2.1  1.1   1.0 ---  260  LEFT
             |       <---   ^   --->      |
             v          |   |   |         v
  N                     |   |   |                         SIG WARRANTS:
W + E                 610  270  290                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Slatten Ranch
```

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB RIGHT (R)	290	290	1650	0.1758	
THRU (T)	270	270	3300	0.0818	
LEFT (L)	610	610	3000	0.2033	0.2033
T + R		560	3300	0.1697	
SB RIGHT (R)	110	110	1650	0.0667	
THRU (T)	410	410	3300	0.1242	
LEFT (L)	230	230	1650	0.1394	
T + R		520	3300	0.1576	0.1576
EB RIGHT (R)	290	0 *	1650	0.0000	
THRU (T)	1160	1160	4950	0.2343	0.2343
LEFT (L)	100	100	1650	0.0606	
WB RIGHT (R)	220	220	1650	0.1333	
THRU (T)	969	969	4950	0.1958	
LEFT (L)	260	260	1650	0.1576	0.1576
T + R		1189	4950	0.2402	

TOTAL VOLUME-TO-CAPACITY RATIO: 0.75

INTERSECTION LEVEL OF SERVICE: C

* ADJUSTED FOR RIGHT TURN ON RED

INT=2025.INT,VOL=2025NP.PMV,CAP=

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
==========================================================================
Condition: Antioch Davidon 2025 No Project PM Peak Hour        10/24/07
==========================================================================
INTERSECTION     6 Live Oak Ave/Laurel Road
Count Date                  Time                Peak Hour
--------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                           3-PHASE SIGNAL
-----------           290    0  130
                        |    |    |
             ^          |    |    |         ^
             |       <---    v   --->       | Split? N
LEFT   340 ---  2.0   1.0  0.0  1.0   1.1 ---   50  RIGHT
                                                              STREET NAME:
THRU  1340 ---> 3.0  (NO. OF LANES)   3.1<--- 1159  THRU  Laurel Road

RIGHT    0 ---  0.0   0.0  0.0  0.0   0.0 ---    0  LEFT
             |       <---    ^   --->       |
             v          |    |    |         v
  N                     |    |    |                       SIG WARRANTS:
W + E                   0    0    0                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Live Oak Ave
==========================================================================
               ORIGINAL   ADJUSTED                V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
--------------------------------------------------------------------------
SB  RIGHT (R)     290        103 *     1720     0.0599
    LEFT (L)      130        130       1720     0.0756     0.0756
--------------------------------------------------------------------------
EB  THRU (T)     1340       1340       5160     0.2597
    LEFT (L)      340        340       3127     0.1087     0.1087
--------------------------------------------------------------------------
WB  RIGHT (R)      50         50       1720     0.0291
    THRU (T)     1159       1159       5160     0.2246
    T + R                   1209       5160     0.2343     0.2343
==========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                         0.42
     INTERSECTION LEVEL OF SERVICE:                             A
==========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025NP.PMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
==============================================================================
Condition: Antioch Davidon 2025 No Project PM Peak Hour         10/24/07
==============================================================================
INTERSECTION     7 Empire Ave/Laurel Road
Count Date                    Time                Peak Hour
------------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                        8-PHASE SIGNAL
-----------           413  300   60
                        |    |    |
             ^          |    |    |         ^
             |       <---    v   --->       | Split? N
LEFT   420 ---  2.0   1.0  2.0  1.0   1.0 ---   50  RIGHT
                                                           STREET NAME:
THRU   890 ---> 2.0  (NO. OF LANES)   2.0<---  686  THRU   Laurel Road

RIGHT  160 ---  1.0   1.0  2.1  1.1   1.0 ---   50  LEFT
             |       <---    ^   --->       |
             v          |    |    |         v
  N                     |    |    |                        SIG WARRANTS:
W + E                 110  360   60                          Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Empire Ave
==============================================================================
```

	MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	60	60	1650	0.0364	
	THRU (T)	360	360	3300	0.1091	
	LEFT (L)	110	110	1650	0.0667	0.0667
	T + R		420	3300	0.1273	
SB	RIGHT (R)	413	182 *	1650	0.1103	0.1103
	THRU (T)	300	300	3300	0.0909	
	LEFT (L)	60	60	1650	0.0364	
EB	RIGHT (R)	160	50 *	1650	0.0303	
	THRU (T)	890	890	3300	0.2697	
	LEFT (L)	420	420	3000	0.1400	0.1400
WB	RIGHT (R)	50	0 *	1650	0.0000	
	THRU (T)	686	686	3300	0.2079	0.2079
	LEFT (L)	50	50	1650	0.0303	

```
==============================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                            0.52
     INTERSECTION LEVEL OF SERVICE:                                A
==============================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025NP.PMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 No Project PM Peak Hour        10/24/07
========================================================================
INTERSECTION     8 Canada Valley/Lone Tree Way
Count Date                   Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                           8-PHASE SIGNAL
-----------           84   20  229
                       |    |    |
             ^         |    |    |         ^
             |       <---   v   --->       | Split? N
LEFT    69 ---  2.0   1.1  1.1  1.0   1.1 ---  464  RIGHT
                                                              STREET NAME:
THRU  1710 ---> 3.0  (NO. OF LANES)   3.1<--- 1090  THRU    Lone Tree Way

RIGHT   60 ---  1.0   1.0  1.0  1.0   2.0 ---  530  LEFT
             |       <---   ^   --->       |
             v         |    |    |         v
  N                    |    |    |                            SIG WARRANTS:
W + E                 220   20  360                             Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Canada Valley
========================================================================
               ORIGINAL   ADJUSTED               V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO      V/C
------------------------------------------------------------------------
NB  RIGHT (R)     360         69 *      1650     0.0418
    THRU (T)       20         20        1650     0.0121
    LEFT (L)      220        220        1650     0.1333     0.1333
------------------------------------------------------------------------
SB  RIGHT (R)      84         84        1650     0.0509
    THRU (T)       20         20        1650     0.0121
    LEFT (L)      229        229        1650     0.1388
    T + R                    104        1650     0.0630     0.0630
------------------------------------------------------------------------
EB  RIGHT (R)      60          0 *      1650     0.0000
    THRU (T)     1710       1710        4950     0.3455     0.3455
    LEFT (L)       69         69        3000     0.0230
------------------------------------------------------------------------
WB  RIGHT (R)     464        464        1650     0.2812
    THRU (T)     1090       1090        4950     0.2202
    LEFT (L)      530        530        3000     0.1767     0.1767
    T + R                   1554        4950     0.3139
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                          0.72
     INTERSECTION LEVEL OF SERVICE:                              C
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025NP.PMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 No Project PM Peak Hour        10/24/07
========================================================================
INTERSECTION     9 SR 4 Bypass SB/Lone Tree Way
Count Date                  Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                        3-PHASE SIGNAL
-----------           240    0  849
                        |    |   |
             ^          |    |   |         ^
             |       <---    v   --->      | Split? N
LEFT     0 ---  0.0   1.0  1.1  2.1   0.0 ---    0  RIGHT
                                                        STREET NAME:
THRU  2051 ---> 3.0  (NO. OF LANES)   3.0<--- 1844  THRU  Lone Tree Way

RIGHT  368 ---  1.0   0.0  0.0  0.0   2.0 ---  380  LEFT
             |       <---    ^   --->      |
             v          |    |   |         v
  N                     |    |   |                      SIG WARRANTS:
W + E                   0    0    0                       Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: SR 4 Bypass SB
========================================================================
               ORIGINAL   ADJUSTED                 V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
SB  RIGHT (R)     240         240       1720     0.1395
    THRU (T)        0           0       1720     0.0000
    LEFT (L)      849         849       3127     0.2715     0.2715
    T + L                     849       3127     0.2715
------------------------------------------------------------------------
EB  RIGHT (R)     368         368       1720     0.2140
    THRU (T)     2051        2051       5160     0.3975     0.3975
------------------------------------------------------------------------
WB  THRU (T)     1844        1844       5160     0.3574
    LEFT (L)      380         380       3127     0.1215     0.1215
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                          0.79
     INTERSECTION LEVEL OF SERVICE:                              C
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025NP.PMV,CAP=
```

CCTALOS Software ver. 2.35 by TJKM Transportation Consultants

Condition: Antioch Davidon 2025 No Project PM Peak Hour 10/24/07

INTERSECTION 10 SR 4 Bypass NB/Lone Tree Way

Count Date Time Peak Hour

```
CCTA METHOD         RIGHT THRU LEFT                   3-PHASE SIGNAL
-----------             0    0    0
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->     | Split? N
LEFT     0 ---  0.0   0.0  0.0  0.0   1.0 ---  711  RIGHT
                                                      STREET NAME:
THRU  2620 ---> 3.0  (NO. OF LANES)   3.0<--- 1695  THRU  Lone Tree Way

RIGHT  280 ---  1.0   2.0  1.0  1.0   2.0 ---   60  LEFT
             |       <---    ^    --->     |
             v          |    |    |         v
  N                     |    |    |                   SIG WARRANTS:
W + E                 530   50  340                     Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: SR 4 Bypass NB
```

	MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	340	307 *	1720	0.1785	0.1785
	THRU (T)	50	50	1720	0.0291	
	LEFT (L)	530	530	3127	0.1695	
EB	RIGHT (R)	280	0 *	1720	0.0000	
	THRU (T)	2620	2620	5160	0.5078	0.5078
WB	RIGHT (R)	711	711	1720	0.4134	
	THRU (T)	1695	1695	5160	0.3285	
	LEFT (L)	60	60	3127	0.0192	0.0192

TOTAL VOLUME-TO-CAPACITY RATIO: 0.71

INTERSECTION LEVEL OF SERVICE: C

* ADJUSTED FOR RIGHT TURN ON RED

INT=2025.INT,VOL=2025NP.PMV,CAP=

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 No Project PM Peak Hour         10/24/07
========================================================================
INTERSECTION    11 Slatten Ranch/Lone Tree Way
Count Date                   Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                       8-PHASE SIGNAL
-----------           570  550   80
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT   470 ---  2.0   1.0  2.0  2.0   1.1 ---   60  RIGHT
                                                          STREET NAME:
THRU  1970 ---> 3.0  (NO. OF LANES)   3.1<--- 1476  THRU  Lone Tree Way

RIGHT  530 ---  1.0   2.0  2.1  1.1   1.0 ---   50  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                       SIG WARRANTS:
W + E                 400  370   80                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Slatten Ranch
========================================================================
               ORIGINAL   ADJUSTED                V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
NB  RIGHT (R)      80         80       1650     0.0485
    THRU (T)      370        370       3300     0.1121
    LEFT (L)      400        400       3000     0.1333     0.1333
    T + R                    450       3300     0.1364
------------------------------------------------------------------------
SB  RIGHT (R)     570        312 *     1650     0.1891     0.1891
    THRU (T)      550        550       3300     0.1667
    LEFT (L)       80         80       3000     0.0267
------------------------------------------------------------------------
EB  RIGHT (R)     530        310 *     1650     0.1879
    THRU (T)     1970       1970       4950     0.3980
    LEFT (L)      470        470       3000     0.1567     0.1567
------------------------------------------------------------------------
WB  RIGHT (R)      60         60       1650     0.0364
    THRU (T)     1476       1476       4950     0.2982
    LEFT (L)       50         50       1650     0.0303
    T + R                   1536       4950     0.3103     0.3103
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                         0.79
     INTERSECTION LEVEL OF SERVICE:                            C
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025NP.PMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
=========================================================================
Condition: Antioch Davidon 2025 No Project PM Peak Hour         10/24/07
=========================================================================
INTERSECTION    12 Empire Ave/Lone Tree Way
Count Date                   Time                Peak Hour
-------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                        8-PHASE SIGNAL
-----------           220  220  310
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT   160 ---  1.0   1.1  2.1  1.0   1.0 ---  160  RIGHT
                                                           STREET NAME:
THRU  1370 ---> 3.0  (NO. OF LANES)   3.0<---  926  THRU   Lone Tree Way

RIGHT  600 ---  1.0   2.0  1.0  1.0   1.0 ---   20  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                        SIG WARRANTS:
W + E                 440  120   40                          Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Empire Ave
=========================================================================
               ORIGINAL   ADJUSTED                V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
-------------------------------------------------------------------------
NB  RIGHT (R)      40         20 *      1650     0.0121
    THRU (T)      120        120        1650     0.0727
    LEFT (L)      440        440        3000     0.1467     0.1467
-------------------------------------------------------------------------
SB  RIGHT (R)     220        220        1650     0.1333     0.1333
    THRU (T)      220        220        3300     0.0667
    LEFT (L)      310        310        1650     0.1879
    T + R                    440        3300     0.1333
-------------------------------------------------------------------------
EB  RIGHT (R)     600        358 *      1650     0.2170
    THRU (T)     1370       1370        4950     0.2768     0.2768
    LEFT (L)      160        160        1650     0.0970
-------------------------------------------------------------------------
WB  RIGHT (R)     160          0 *      1650     0.0000
    THRU (T)      926        926        4950     0.1871
    LEFT (L)       20         20        1650     0.0121     0.0121
=========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                          0.57
     INTERSECTION LEVEL OF SERVICE:                             A
=========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025NP.PMV,CAP=
```

CCTALOS Software ver. 2.35 by TJKM Transportation Consultants

```
========================================================================
Condition: Antioch Davidon 2025 No Project PM Peak Hour        10/24/07
========================================================================
INTERSECTION    13 Deer Valley Rd/Lone Tree Way
Count Date                   Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                     8-PHASE SIGNAL
-----------           150  510  310
                        |   |   |
             ^          |   |   |         ^
             |       <---   v   --->      | Split? N
LEFT   320 ---  1.0   1.1  2.1  1.0   1.1 ---  160  RIGHT
                                                          STREET NAME:
THRU  1782 ---> 3.1  (NO. OF LANES)   3.1<--- 1400  THRU  Lone Tree Way

RIGHT  190 ---  1.1   2.0  2.1  1.1   1.0 ---  190  LEFT
             |       <---   ^   --->      |
             v          |   |   |         v
  N                     |   |   |                         SIG WARRANTS:
W + E                 260  400  180                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Deer Valley Rd
```

	MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	180	180	1650	0.1091	
	THRU (T)	400	400	3300	0.1212	
	LEFT (L)	260	260	3000	0.0867	
	T + R		580	3300	0.1758	0.1758
SB	RIGHT (R)	150	150	1650	0.0909	
	THRU (T)	510	510	3300	0.1545	
	LEFT (L)	310	310	1650	0.1879	0.1879
	T + R		660	3300	0.2000	
EB	RIGHT (R)	190	190	1650	0.1152	
	THRU (T)	1782	1782	4950	0.3600	
	LEFT (L)	320	320	1650	0.1939	
	T + R		1972	4950	0.3984	0.3984
WB	RIGHT (R)	160	160	1650	0.0970	
	THRU (T)	1400	1400	4950	0.2828	
	LEFT (L)	190	190	1650	0.1152	0.1152
	T + R		1560	4950	0.3152	

TOTAL VOLUME-TO-CAPACITY RATIO: 0.88

INTERSECTION LEVEL OF SERVICE: D

* ADJUSTED FOR RIGHT TURN ON RED

INT=2025.INT,VOL=2025NP.PMV,CAP=

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 No Project PM Peak Hour        10/24/07
========================================================================
INTERSECTION    14 Hillcrest Ave/Lone Tree Way
Count Date                   Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                       8-PHASE SIGNAL
-----------           446  120  580
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT   703 ---  1.0   1.0  2.1  2.1   1.0 ---  480  RIGHT
                                                          STREET NAME:
THRU  1589 ---> 3.1  (NO. OF LANES)   3.0<--- 1354  THRU  Lone Tree Way

RIGHT   80 ---  1.1   1.0  2.1  1.1   1.0 ---  100  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                       SIG WARRANTS:
W + E                  50   70   60                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? Y

               STREET NAME: Hillcrest Ave
========================================================================
               ORIGINAL   ADJUSTED                 V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
NB  RIGHT (R)      60          60       1650     0.0364
    THRU (T)       70          70       3300     0.0212
    LEFT (L)       50          50       1650     0.0303
    T + R                     130       3300     0.0394     0.0394
------------------------------------------------------------------------
SB  RIGHT (R)     446           0 *     1650     0.0000
    THRU (T)      120         120       3300     0.0364
    LEFT (L)      580         580       3000     0.1933     0.1933
    T + L                     700       4650     0.1505
------------------------------------------------------------------------
EB  RIGHT (R)      80          80       1650     0.0485
    THRU (T)     1589        1589       4950     0.3210
    LEFT (L)      703         703       1650     0.4261     0.4261
    T + R                    1669       4950     0.3372
------------------------------------------------------------------------
WB  RIGHT (R)     480         161 *     1650     0.0976
    THRU (T)     1354        1354       4950     0.2735     0.2735
    LEFT (L)      100         100       1650     0.0606
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                            0.93
     INTERSECTION LEVEL OF SERVICE:                                E
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025NP.PMV,CAPE=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
==========================================================================
Condition: Antioch Davidon 2025 No Project PM Peak Hour        10/24/07
==========================================================================
INTERSECTION    15 Vista Grande Dr/Lone Tree Way
Count Date                   Time                Peak Hour
--------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                         5-PHASE SIGNAL
-----------           170   40   70
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT   190 ---  1.0   1.1  1.1  1.0   1.0 ---   90  RIGHT
                                                            STREET NAME:
THRU  1649 ---> 3.0  (NO. OF LANES)   3.0<--- 1204  THRU  Lone Tree Way

RIGHT  390 ---  1.0   1.0  1.0  1.0   1.0 ---  300  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                         SIG WARRANTS:
W + E                 320   50  220                           Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Vista Grande Dr
```

	MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	220	0 *	1650	0.0000	
	THRU (T)	50	50	1650	0.0303	
	LEFT (L)	320	320	1650	0.1939	0.1939
SB	RIGHT (R)	170	170	1650	0.1030	
	THRU (T)	40	40	1650	0.0242	
	LEFT (L)	70	70	1650	0.0424	
	T + R		210	1650	0.1273	0.1273
EB	RIGHT (R)	390	70 *	1650	0.0424	
	THRU (T)	1649	1649	4950	0.3331	0.3331
	LEFT (L)	190	190	1650	0.1152	
WB	RIGHT (R)	90	20 *	1650	0.0121	
	THRU (T)	1204	1204	4950	0.2432	
	LEFT (L)	300	300	1650	0.1818	0.1818

TOTAL VOLUME-TO-CAPACITY RATIO: 0.84

INTERSECTION LEVEL OF SERVICE: D

* ADJUSTED FOR RIGHT TURN ON RED

INT=2025.INT,VOL=2025NP.PMV,CAP=

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 No Project PM Peak Hour        10/24/07
========================================================================
INTERSECTION    16 Hillcrest/Country Hills
Count Date                   Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                         8-PHASE SIGNAL
-----------            80  916  110
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT    70 ---  1.0   1.1  2.1  1.0   1.1 ---   90  RIGHT
                                                            STREET NAME:
THRU    20 ---> 1.0  (NO. OF LANES)   1.1<---   50  THRU  Country Hills

RIGHT  100 ---  1.0   1.0  2.1  1.1   1.0 ---  120  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                         SIG WARRANTS:
W + E                 100 1053   70                           Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Hillcrest
========================================================================
               ORIGINAL   ADJUSTED                 V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
NB  RIGHT (R)      70         70       1650     0.0424
    THRU (T)     1053       1053       3300     0.3191
    LEFT (L)      100        100       1650     0.0606
    T + R                   1123       3300     0.3403     0.3403
------------------------------------------------------------------------
SB  RIGHT (R)      80         80       1650     0.0485
    THRU (T)      916        916       3300     0.2776
    LEFT (L)      110        110       1650     0.0667     0.0667
    T + R                    996       3300     0.3018
------------------------------------------------------------------------
EB  RIGHT (R)     100          0 *     1650     0.0000
    THRU (T)       20         20       1650     0.0121
    LEFT (L)       70         70       1650     0.0424     0.0424
------------------------------------------------------------------------
WB  RIGHT (R)      90         90       1650     0.0545
    THRU (T)       50         50       1650     0.0303
    LEFT (L)      120        120       1650     0.0727
    T + R                    140       1650     0.0848     0.0848
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                          0.53
     INTERSECTION LEVEL OF SERVICE:                             A
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025NP.PMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 No Project PM Peak Hour        10/24/07
========================================================================
INTERSECTION    18 Hillcrest/Laurel
Count Date                      Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                             8-PHASE SIGNAL
-----------           220  910  273
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT   140 ---  1.0   1.1  2.1  1.0   1.0 ---  240  RIGHT
                                                      STREET NAME:
THRU    80 ---> 1.1  (NO. OF LANES)   1.0<---  120  THRU  Laurel

RIGHT  110 ---  1.1   1.0  2.1  1.1   1.0 ---  346  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                     SIG WARRANTS:
W + E                  90  970  283                       Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Hillcrest
========================================================================
               ORIGINAL   ADJUSTED                  V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
NB  RIGHT (R)     283         283        1650     0.1715
    THRU (T)      970         970        3300     0.2939
    LEFT (L)       90          90        1650     0.0545
    T + R                    1253        3300     0.3797     0.3797
------------------------------------------------------------------------
SB  RIGHT (R)     220         220        1650     0.1333
    THRU (T)      910         910        3300     0.2758
    LEFT (L)      273         273        1650     0.1655     0.1655
    T + R                    1130        3300     0.3424
------------------------------------------------------------------------
EB  RIGHT (R)     110         110        1650     0.0667
    THRU (T)       80          80        1650     0.0485
    LEFT (L)      140         140        1650     0.0848
    T + R                     190        1650     0.1152     0.1152
------------------------------------------------------------------------
WB  RIGHT (R)     240           0 *      1650     0.0000
    THRU (T)      120         120        1650     0.0727
    LEFT (L)      346         346        1650     0.2097     0.2097
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                           0.87
     INTERSECTION LEVEL OF SERVICE:                              D
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025NP.PMV,CAP=
```

Cumulative With Project

FEHR & PEERS
TRANSPORTATION CONSULTANTS

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 With Project AM Peak Hour       10/24/07
========================================================================
INTERSECTION     1 Canada Valley/Laurel Road
Count Date                  Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                          3-PHASE SIGNAL
-----------             0    0    0
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT     0 ---  0.0   0.0  0.0  0.0   0.0 ---    0  RIGHT
                                                          STREET NAME:
THRU   960 ---> 2.1  (NO. OF LANES)   2.0<---  670  THRU  Laurel Road

RIGHT  100 ---  1.1   1.0  0.0  1.0   1.0 ---  260  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                       SIG WARRANTS:
W + E                 120    0  290                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Canada Valley
========================================================================
               ORIGINAL   ADJUSTED                V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
NB  RIGHT (R)     290          30 *     1720     0.0174
    LEFT (L)      120         120       1720     0.0698     0.0698
------------------------------------------------------------------------
EB  RIGHT (R)     100         100       1720     0.0581
    THRU (T)      960         960       3440     0.2791
    T + R                    1060       3440     0.3081     0.3081
------------------------------------------------------------------------
WB  THRU (T)      670         670       3440     0.1948
    LEFT (L)      260         260       1720     0.1512     0.1512
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                            0.53
     INTERSECTION LEVEL OF SERVICE:                               A
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025WP.AMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
=========================================================================
Condition: Antioch Davidon 2025 With Project AM Peak Hour       10/24/07
=========================================================================
INTERSECTION     2 Country Hills Dr/Laurel Road
Count Date                    Time                Peak Hour
-------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                         8-PHASE SIGNAL
-----------           60   30   80
                       |    |    |
             ^         |    |    |         ^
             |       <---   v   --->       | Split? N
LEFT    40 ---  1.0   1.1  1.1  1.0   1.1 ---   30  RIGHT
                                                          STREET NAME:
THRU   760 ---> 2.1  (NO. OF LANES)   2.1<---  660  THRU  Laurel Road

RIGHT  420 ---  1.1   1.0  1.1  1.1   1.0 ---  100  LEFT
             |       <---   ^   --->       |
             v         |    |    |         v
  N                    |    |    |                        SIG WARRANTS:
W + E                 160   20  330                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Country Hills Dr
=========================================================================
               ORIGINAL   ADJUSTED                 V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
-------------------------------------------------------------------------
NB  RIGHT (R)     330        330       1650     0.2000
    THRU (T)       20         20       1650     0.0121
    LEFT (L)      160        160       1650     0.0970
    T + R                    350       1650     0.2121     0.2121
-------------------------------------------------------------------------
SB  RIGHT (R)      60         60       1650     0.0364
    THRU (T)       30         30       1650     0.0182
    LEFT (L)       80         80       1650     0.0485     0.0485
    T + R                     90       1650     0.0545
-------------------------------------------------------------------------
EB  RIGHT (R)     420        420       1650     0.2545
    THRU (T)      760        760       3300     0.2303
    LEFT (L)       40         40       1650     0.0242
    T + R                   1180       3300     0.3576     0.3576
-------------------------------------------------------------------------
WB  RIGHT (R)      30         30       1650     0.0182
    THRU (T)      660        660       3300     0.2000
    LEFT (L)      100        100       1650     0.0606     0.0606
    T + R                    690       3300     0.2091
=========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                         0.68
     INTERSECTION LEVEL OF SERVICE:                            B
=========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025WP.AMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
=========================================================================
Condition: Antioch Davidon 2025 With Project AM Peak Hour       10/24/07
=========================================================================
INTERSECTION     3 SR 4 Bypass SB/Laurel Road
Count Date                   Time                Peak Hour
-------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                         2-PHASE SIGNAL
-----------           340    0  840
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT     0 ---  0.0   1.0  1.1  2.1   0.0 ---    0  RIGHT
                                                            STREET NAME:
THRU  1080 ---> 2.1  (NO. OF LANES)   2.0<---  450  THRU  Laurel Road

RIGHT   90 ---  1.1   0.0  0.0  0.0   0.0 ---    0  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                         SIG WARRANTS:
W + E                   0    0    0                           Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: SR 4 Bypass SB
=========================================================================
               ORIGINAL   ADJUSTED               V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO      V/C
-------------------------------------------------------------------------
SB  RIGHT (R)     340        340       1800     0.1889
    THRU (T)        0          0       1800     0.0000
    LEFT (L)      840        840       3273     0.2566     0.2566
    T + L                    840       3273     0.2566
-------------------------------------------------------------------------
EB  RIGHT (R)      90         90       1800     0.0500
    THRU (T)     1080       1080       3600     0.3000
    T + R                   1170       3600     0.3250     0.3250
-------------------------------------------------------------------------
WB  THRU (T)      450        450       3600     0.1250
=========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                          0.58
     INTERSECTION LEVEL OF SERVICE:                             A
=========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025WP.AMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 With Project AM Peak Hour       10/24/07
========================================================================
INTERSECTION     4 SR 4 Bypass NB/Laurel Road
Count Date                  Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                            3-PHASE SIGNAL
-----------             0    0    0
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT   260 ---  1.0   0.0  0.0  0.0   1.0 ---  620  RIGHT
                                                      STREET NAME:
THRU  1660 ---> 2.0  (NO. OF LANES)   2.0<---  580  THRU  Laurel Road

RIGHT    0 ---  0.0   1.1  1.1  1.0   0.0 ---    0  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                       SIG WARRANTS:
W + E                  20    0  100                         Urb=N, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: SR 4 Bypass NB
========================================================================
               ORIGINAL   ADJUSTED                V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
NB  RIGHT (R)     100        100       1720     0.0581     0.0581
    THRU (T)        0          0       1720     0.0000
    LEFT (L)       20         20       1720     0.0116
    T + L                     20       1720     0.0116
------------------------------------------------------------------------
EB  THRU (T)     1660       1660       3440     0.4826
    LEFT (L)      260        260       1720     0.1512     0.1512
------------------------------------------------------------------------
WB  RIGHT (R)     620        620       1720     0.3605     0.3605
    THRU (T)      580        580       3440     0.1686
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                         0.57
     INTERSECTION LEVEL OF SERVICE:                             A
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025WP.AMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 With Project AM Peak Hour       10/24/07
========================================================================
INTERSECTION     5 Slatten Ranch/Laurel Road
Count Date                   Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                           8-PHASE SIGNAL
-----------            40  180  130
                        |   |   |
             ^          |   |   |         ^
             |       <---   v   --->      | Split? N
LEFT   160 ---  1.0   1.1  2.1  1.0   1.1 ---  320  RIGHT
                                                          STREET NAME:
THRU   970 ---> 3.0  (NO. OF LANES)   3.1<---  990  THRU  Laurel Road

RIGHT  630 ---  1.0   2.0  2.1  1.1   1.0 ---  260  LEFT
             |       <---   ^   --->      |
             v          |   |   |         v
  N                     |   |   |                         SIG WARRANTS:
W + E                 170  250  160                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Slatten Ranch
========================================================================
               ORIGINAL   ADJUSTED                 V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
NB  RIGHT (R)     160        160       1650     0.0970
    THRU (T)      250        250       3300     0.0758
    LEFT (L)      170        170       3000     0.0567
    T + R                    410       3300     0.1242     0.1242
------------------------------------------------------------------------
SB  RIGHT (R)      40         40       1650     0.0242
    THRU (T)      180        180       3300     0.0545
    LEFT (L)      130        130       1650     0.0788     0.0788
    T + R                    220       3300     0.0667
------------------------------------------------------------------------
EB  RIGHT (R)     630        537 *     1650     0.3255     0.3255
    THRU (T)      970        970       4950     0.1960
    LEFT (L)      160        160       1650     0.0970
------------------------------------------------------------------------
WB  RIGHT (R)     320        320       1650     0.1939
    THRU (T)      990        990       4950     0.2000
    LEFT (L)      260        260       1650     0.1576     0.1576
    T + R                   1310       4950     0.2646
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                             0.69
     INTERSECTION LEVEL OF SERVICE:                                 B
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025WP.AMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
=========================================================================
Condition: Antioch Davidon 2025 With Project AM Peak Hour       10/24/07
=========================================================================
INTERSECTION     6 Live Oak Ave/Laurel Road
Count Date                   Time                Peak Hour
-------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                       3-PHASE SIGNAL
-----------           310    0   60
                        |    |    |
             ^          |    |    |         ^
             |       <---    v   --->       | Split? N
LEFT   290 ---  2.0   1.0  0.0  1.0   1.1 ---   90  RIGHT
                                                          STREET NAME:
THRU   970 ---> 3.0  (NO. OF LANES)   3.1<--- 1260  THRU  Laurel Road

RIGHT    0 ---  0.0   0.0  0.0  0.0   0.0 ---    0  LEFT
             |       <---    ^   --->       |
             v          |    |    |         v
  N                     |    |    |                       SIG WARRANTS:
W + E                   0    0    0                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Live Oak Ave
```

	MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
SB	RIGHT (R)	310	150 *	1720	0.0872	0.0872
	LEFT (L)	60	60	1720	0.0349	
EB	THRU (T)	970	970	5160	0.1880	
	LEFT (L)	290	290	3127	0.0927	0.0927
WB	RIGHT (R)	90	90	1720	0.0523	
	THRU (T)	1260	1260	5160	0.2442	
	T + R		1350	5160	0.2616	0.2616

TOTAL VOLUME-TO-CAPACITY RATIO: 0.44

INTERSECTION LEVEL OF SERVICE: A

* ADJUSTED FOR RIGHT TURN ON RED

INT=2025.INT,VOL=2025WP.AMV,CAP=

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
==========================================================================
Condition: Antioch Davidon 2025 With Project AM Peak Hour       10/24/07
==========================================================================
INTERSECTION     7 Empire Ave/Laurel Road
Count Date                   Time                Peak Hour
--------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                         8-PHASE SIGNAL
-----------           350  310   40
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT   300 ---  2.0   1.0  2.0  1.0   1.0 ---  140  RIGHT
                                                            STREET NAME:
THRU   680 ---> 2.0  (NO. OF LANES)   2.0<---  860  THRU   Laurel Road

RIGHT   50 ---  1.0   1.0  2.1  1.1   1.0 ---   70  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                         SIG WARRANTS:
W + E                 140  220   10                           Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Empire Ave
==========================================================================
               ORIGINAL   ADJUSTED                V/C      CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
--------------------------------------------------------------------------
NB  RIGHT (R)      10          10       1650     0.0061
    THRU (T)      220         220       3300     0.0667
    LEFT (L)      140         140       1650     0.0848     0.0848
    T + R                     230       3300     0.0697
--------------------------------------------------------------------------
SB  RIGHT (R)     350         185 *     1650     0.1121     0.1121
    THRU (T)      310         310       3300     0.0939
    LEFT (L)       40          40       1650     0.0242
--------------------------------------------------------------------------
EB  RIGHT (R)      50           0 *     1650     0.0000
    THRU (T)      680         680       3300     0.2061
    LEFT (L)      300         300       3000     0.1000     0.1000
--------------------------------------------------------------------------
WB  RIGHT (R)     140         100 *     1650     0.0606
    THRU (T)      860         860       3300     0.2606     0.2606
    LEFT (L)       70          70       1650     0.0424
==========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                          0.56
     INTERSECTION LEVEL OF SERVICE:                             A
==========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025WP.AMV,CAP=
```

CCTALOS Software ver. 2.35 by TJKM Transportation Consultants

Condition: Antioch Davidon 2025 With Project AM Peak Hour   10/24/07

```
INTERSECTION     8 Canada Valley/Lone Tree Way
Count Date                   Time                Peak Hour
---------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                          8-PHASE SIGNAL
-----------            80   10  360
                        |    |    |
             ^          |    |    |         ^
             |       <---    v   --->       | Split? N
LEFT    60 ---  2.0   1.1  1.1  1.0   1.1 ---  260  RIGHT
                                                             STREET NAME:
THRU   950 ---> 3.0  (NO. OF LANES)   3.1<--- 1460  THRU   Lone Tree Way

RIGHT   20 ---  1.0   1.0  1.0  1.0   2.0 ---  260  LEFT
             |       <---    ^   --->       |
             v          |    |    |         v
  N                     |    |    |                          SIG WARRANTS:
W + E                  50   10  160                            Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Canada Valley
```

	MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	160	17 *	1650	0.0103	0.0103
	THRU (T)	10	10	1650	0.0061	
	LEFT (L)	50	50	1650	0.0303	
SB	RIGHT (R)	80	80	1650	0.0485	
	THRU (T)	10	10	1650	0.0061	
	LEFT (L)	360	360	1650	0.2182	0.2182
	T + R		90	1650	0.0545	
EB	RIGHT (R)	20	0 *	1650	0.0000	
	THRU (T)	950	950	4950	0.1919	
	LEFT (L)	60	60	3000	0.0200	0.0200
WB	RIGHT (R)	260	260	1650	0.1576	
	THRU (T)	1460	1460	4950	0.2949	
	LEFT (L)	260	260	3000	0.0867	
	T + R		1720	4950	0.3475	0.3475

TOTAL VOLUME-TO-CAPACITY RATIO: 0.60

INTERSECTION LEVEL OF SERVICE: A

* ADJUSTED FOR RIGHT TURN ON RED

INT=2025.INT,VOL=2025WP.AMV,CAP=

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 With Project AM Peak Hour       10/24/07
========================================================================
INTERSECTION     9 SR 4 Bypass SB/Lone Tree Way
Count Date                   Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                        3-PHASE SIGNAL
-----------           200    0  740
                        |   |   |
             ^          |   |   |         ^
             |        <---   v   --->      | Split? N
LEFT     0 ---  0.0   1.0  1.1  2.1   0.0 ---    0  RIGHT
                                                          STREET NAME:
THRU  1170 ---> 3.0  (NO. OF LANES)   3.0<--- 1780  THRU  Lone Tree Way

RIGHT  300 ---  1.0   0.0  0.0  0.0   2.0 ---  160  LEFT
             |        <---   ^   --->      |
             v          |   |   |         v
  N                     |   |   |                         SIG WARRANTS:
W + E                   0    0    0                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: SR 4 Bypass SB
========================================================================
               ORIGINAL   ADJUSTED                 V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
SB  RIGHT (R)     200         200       1720     0.1163
    THRU (T)        0           0       1720     0.0000
    LEFT (L)      740         740       3127     0.2366     0.2366
    T + L                     740       3127     0.2366
------------------------------------------------------------------------
EB  RIGHT (R)     300         300       1720     0.1744
    THRU (T)     1170        1170       5160     0.2267
------------------------------------------------------------------------
WB  THRU (T)     1780        1780       5160     0.3450     0.3450
    LEFT (L)      160         160       3127     0.0512
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                          0.58
     INTERSECTION LEVEL OF SERVICE:                              A
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025WP.AMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 With Project AM Peak Hour       10/24/07
========================================================================
INTERSECTION    10 SR 4 Bypass NB/Lone Tree Way
Count Date                   Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                       3-PHASE SIGNAL
-----------             0    0    0
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT     0 ---  0.0   0.0  0.0  0.0   1.0 ---  720  RIGHT
                                                          STREET NAME:
THRU  1610 ---> 3.0  (NO. OF LANES)   3.0<--- 1660  THRU  Lone Tree Way

RIGHT  300 ---  1.0   2.0  1.0  1.0   2.0 ---   70  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                       SIG WARRANTS:
W + E                 280   10  250                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: SR 4 Bypass NB
========================================================================
               ORIGINAL   ADJUSTED                V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
NB  RIGHT (R)     250         211 *     1720     0.1227     0.1227
    THRU (T)       10          10       1720     0.0058
    LEFT (L)      280         280       3127     0.0895
------------------------------------------------------------------------
EB  RIGHT (R)     300         146 *     1720     0.0849
    THRU (T)     1610        1610       5160     0.3120
------------------------------------------------------------------------
WB  RIGHT (R)     720         720       1720     0.4186     0.4186
    THRU (T)     1660        1660       5160     0.3217
    LEFT (L)       70          70       3127     0.0224
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                          0.54
     INTERSECTION LEVEL OF SERVICE:                              A
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025WP.AMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 With Project AM Peak Hour       10/24/07
========================================================================
INTERSECTION    11 Slatten Ranch/Lone Tree Way
Count Date                   Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                     8-PHASE SIGNAL
-----------           280  150   10
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT   460 ---  2.0   1.0  2.0  2.0   1.1 ---   50  RIGHT
                                                        STREET NAME:
THRU  1140 ---> 3.0  (NO. OF LANES)   3.1<--- 1700  THRU  Lone Tree Way

RIGHT  240 ---  1.0   2.0  2.1  1.1   1.0 ---   70  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                     SIG WARRANTS:
W + E                 500  500   30                       Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Slatten Ranch
========================================================================
               ORIGINAL   ADJUSTED                V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
NB  RIGHT (R)      30         30       1650     0.0182
    THRU (T)      500        500       3300     0.1515
    LEFT (L)      500        500       3000     0.1667     0.1667
    T + R                    530       3300     0.1606
------------------------------------------------------------------------
SB  RIGHT (R)     280         27 *     1650     0.0164
    THRU (T)      150        150       3300     0.0455     0.0455
    LEFT (L)       10         10       3000     0.0033
------------------------------------------------------------------------
EB  RIGHT (R)     240          0 *     1650     0.0000
    THRU (T)     1140       1140       4950     0.2303
    LEFT (L)      460        460       3000     0.1533     0.1533
------------------------------------------------------------------------
WB  RIGHT (R)      50         50       1650     0.0303
    THRU (T)     1700       1700       4950     0.3434
    LEFT (L)       70         70       1650     0.0424
    T + R                   1750       4950     0.3535     0.3535
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                         0.72
     INTERSECTION LEVEL OF SERVICE:                             C
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025WP.AMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 With Project AM Peak Hour       10/24/07
========================================================================
INTERSECTION    12 Empire Ave/Lone Tree Way
Count Date                     Time               Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                       8-PHASE SIGNAL
-----------           100   90   90
                        |   |   |
             ^          |   |   |         ^
             |       <---   v   --->      | Split? N
LEFT   220 ---  1.0   1.1  2.1  1.0   1.0 ---  340  RIGHT
                                                          STREET NAME:
THRU   710 ---> 3.0  (NO. OF LANES)   3.0<--- 1210  THRU  Lone Tree Way

RIGHT  260 ---  1.0   2.0  1.0  1.0   1.0 ---   30  LEFT
             |       <---   ^   --->      |
             v          |   |   |         v
  N                     |   |   |                         SIG WARRANTS:
W + E                 510  200   20                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Empire Ave
```

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB RIGHT (R)	20	0 *	1650	0.0000	
THRU (T)	200	200	1650	0.1212	
LEFT (L)	510	510	3000	0.1700	0.1700
SB RIGHT (R)	100	100	1650	0.0606	0.0606
THRU (T)	90	90	3300	0.0273	
LEFT (L)	90	90	1650	0.0545	
T + R		190	3300	0.0576	
EB RIGHT (R)	260	0 *	1650	0.0000	
THRU (T)	710	710	4950	0.1434	
LEFT (L)	220	220	1650	0.1333	0.1333
WB RIGHT (R)	340	250 *	1650	0.1515	
THRU (T)	1210	1210	4950	0.2444	0.2444
LEFT (L)	30	30	1650	0.0182	

```
     TOTAL VOLUME-TO-CAPACITY RATIO:                          0.61
     INTERSECTION LEVEL OF SERVICE:                              B
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025WP.AMV,CAPP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 With Project AM Peak Hour      10/24/07
========================================================================
INTERSECTION    13 Deer Valley Rd/Lone Tree Way
Count Date                   Time               Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                         8-PHASE SIGNAL
-----------           100  380  340
                        |    |    |
             ^          |    |    |         ^
             |        <---   v   --->       | Split? N
LEFT   110 ---  1.0   1.1  2.1  1.0   1.1 ---  360  RIGHT
                                                        STREET NAME:
THRU   720 ---> 3.1  (NO. OF LANES)   3.1<--- 1380  THRU  Lone Tree Way

RIGHT  160 ---  1.1   2.0  2.1  1.1   1.0 ---  200  LEFT
             |        <---   ^   --->       |
             v          |    |    |         v
  N                     |    |    |                     SIG WARRANTS:
W + E                 450  520  220                       Urb=Y, Rur=Y
  S                   LEFT THRU RIGHT Split? N

               STREET NAME: Deer Valley Rd
========================================================================
               ORIGINAL   ADJUSTED               V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO      V/C
------------------------------------------------------------------------
NB  RIGHT (R)     220        220       1650     0.1333
    THRU (T)      520        520       3300     0.1576
    LEFT (L)      450        450       3000     0.1500
    T + R                    740       3300     0.2242     0.2242
------------------------------------------------------------------------
SB  RIGHT (R)     100        100       1650     0.0606
    THRU (T)      380        380       3300     0.1152
    LEFT (L)      340        340       1650     0.2061     0.2061
    T + R                    480       3300     0.1455
------------------------------------------------------------------------
EB  RIGHT (R)     160        160       1650     0.0970
    THRU (T)      720        720       4950     0.1455
    LEFT (L)      110        110       1650     0.0667     0.0667
    T + R                    880       4950     0.1778
------------------------------------------------------------------------
WB  RIGHT (R)     360        360       1650     0.2182
    THRU (T)     1380       1380       4950     0.2788
    LEFT (L)      200        200       1650     0.1212
    T + R                   1740       4950     0.3515     0.3515
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                         0.85
     INTERSECTION LEVEL OF SERVICE:                            D
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025WP.AMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 With Project AM Peak Hour       10/24/07
========================================================================
INTERSECTION    14 Hillcrest Ave/Lone Tree Way
Count Date                   Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                      8-PHASE SIGNAL
-----------           470   40  380
                        |    |    |
             ^          |    |    |         ^
             |       <---    v   --->       | Split? N
LEFT   290 ---  1.0   1.0  2.1  2.1   1.0 ---  400  RIGHT
                                                          STREET NAME:
THRU   810 ---> 3.1  (NO. OF LANES)   3.0<--- 1310  THRU  Lone Tree Way

RIGHT   30 ---  1.1   1.0  2.1  1.1   1.0 ---   40  LEFT
             |       <---    ^   --->       |
             v          |    |    |         v
  N                     |    |    |                       SIG WARRANTS:
W + E                  80   70   80                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? Y

               STREET NAME: Hillcrest Ave
```

	MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	80	80	1650	0.0485	0.0485
	THRU (T)	70	70	3300	0.0212	
	LEFT (L)	80	80	1650	0.0485	
	T + R		150	3300	0.0455	
SB	RIGHT (R)	470	180 *	1650	0.1091	
	THRU (T)	40	40	3300	0.0121	
	LEFT (L)	380	380	3000	0.1267	0.1267
	T + L		420	4650	0.0903	
EB	RIGHT (R)	30	30	1650	0.0182	
	THRU (T)	810	810	4950	0.1636	
	LEFT (L)	290	290	1650	0.1758	0.1758
	T + R		840	4950	0.1697	
WB	RIGHT (R)	400	191 *	1650	0.1158	
	THRU (T)	1310	1310	4950	0.2646	0.2646
	LEFT (L)	40	40	1650	0.0242	

```
     TOTAL VOLUME-TO-CAPACITY RATIO:                            0.62
     INTERSECTION LEVEL OF SERVICE:                                B
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025WP.AMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 With Project AM Peak Hour       10/24/07
========================================================================
INTERSECTION    15 Vista Grande Dr/Lone Tree Way
Count Date                   Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                       5-PHASE SIGNAL
-----------            60   20   70
                        |    |    |
             ^          |    |    |         ^
             |       <---    v   --->       | Split? N
LEFT   110 ---  1.0   1.1  1.1  1.0   1.0 ---  140  RIGHT
                                                          STREET NAME:
THRU   910 ---> 3.0  (NO. OF LANES)   3.0<--- 1370  THRU  Lone Tree Way

RIGHT  220 ---  1.0   1.0  1.0  1.0   1.0 ---  170  LEFT
             |       <---    ^   --->       |
             v          |    |    |         v
  N                     |    |    |                       SIG WARRANTS:
W + E                 300   20  130                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Vista Grande Dr
========================================================================
               ORIGINAL   ADJUSTED                 V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
NB  RIGHT (R)     130          0 *     1650     0.0000
    THRU (T)       20         20       1650     0.0121
    LEFT (L)      300        300       1650     0.1818     0.1818
------------------------------------------------------------------------
SB  RIGHT (R)      60         60       1650     0.0364
    THRU (T)       20         20       1650     0.0121
    LEFT (L)       70         70       1650     0.0424
    T + R                     80       1650     0.0485     0.0485
------------------------------------------------------------------------
EB  RIGHT (R)     220          0 *     1650     0.0000
    THRU (T)      910        910       4950     0.1838
    LEFT (L)      110        110       1650     0.0667     0.0667
------------------------------------------------------------------------
WB  RIGHT (R)     140         70 *     1650     0.0424
    THRU (T)     1370       1370       4950     0.2768     0.2768
    LEFT (L)      170        170       1650     0.1030
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                           0.57
     INTERSECTION LEVEL OF SERVICE:                               A
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025WP.AMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 With Project AM Peak Hour       10/24/07
========================================================================
INTERSECTION    16 Hillcrest/Country Hills
Count Date                   Time               Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                       8-PHASE SIGNAL
-----------            30  740   80
                        |   |   |
             ^          |   |   |         ^
             |       <---   v   --->      | Split? N
LEFT    70 ---  1.0   1.1  2.1  1.0   1.1 ---   60  RIGHT
                                                          STREET NAME:
THRU    40 ---> 1.0  (NO. OF LANES)   1.1<---   60  THRU  Country Hills

RIGHT   50 ---  1.0   1.0  2.1  1.1   1.0 ---  110  LEFT
             |       <---   ^   --->      |
             v          |   |   |         v
  N                     |   |   |                         SIG WARRANTS:
W + E                 100  710  150                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Hillcrest
========================================================================
               ORIGINAL   ADJUSTED                   V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
NB  RIGHT (R)     150        150       1650     0.0909
    THRU (T)      710        710       3300     0.2152
    LEFT (L)      100        100       1650     0.0606
    T + R                    860       3300     0.2606     0.2606
------------------------------------------------------------------------
SB  RIGHT (R)      30         30       1650     0.0182
    THRU (T)      740        740       3300     0.2242
    LEFT (L)       80         80       1650     0.0485     0.0485
    T + R                    770       3300     0.2333
------------------------------------------------------------------------
EB  RIGHT (R)      50          0 *     1650     0.0000
    THRU (T)       40         40       1650     0.0242
    LEFT (L)       70         70       1650     0.0424     0.0424
------------------------------------------------------------------------
WB  RIGHT (R)      60         60       1650     0.0364
    THRU (T)       60         60       1650     0.0364
    LEFT (L)      110        110       1650     0.0667
    T + R                    120       1650     0.0727     0.0727
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                           0.42
     INTERSECTION LEVEL OF SERVICE:                              A
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025WP.AMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 With Project AM Peak Hour      10/24/07
========================================================================
INTERSECTION    18 Hillcrest/Laurel
Count Date                     Time                  Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                         8-PHASE SIGNAL
-----------           120  860  320
                        |    |    |
             ^          |    |    |         ^
             |       <---    v   --->       | Split? N
LEFT   170 ---  1.0   1.1  2.1  1.0   1.0 ---  210  RIGHT
                                                       STREET NAME:
THRU    80 ---> 1.1  (NO. OF LANES)   1.0<---  100  THRU  Laurel

RIGHT  110 ---  1.1   1.0  2.1  1.1   1.0 ---  260  LEFT
             |       <---    ^   --->       |
             v          |    |    |         v
  N                     |    |    |                     SIG WARRANTS:
W + E                  90  900  360                       Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Hillcrest
========================================================================
               ORIGINAL   ADJUSTED                V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
NB  RIGHT (R)     360        360       1650     0.2182
    THRU (T)      900        900       3300     0.2727
    LEFT (L)       90         90       1650     0.0545
    T + R                   1260       3300     0.3818     0.3818
------------------------------------------------------------------------
SB  RIGHT (R)     120        120       1650     0.0727
    THRU (T)      860        860       3300     0.2606
    LEFT (L)      320        320       1650     0.1939     0.1939
    T + R                    980       3300     0.2970
------------------------------------------------------------------------
EB  RIGHT (R)     110        110       1650     0.0667
    THRU (T)       80         80       1650     0.0485
    LEFT (L)      170        170       1650     0.1030
    T + R                    190       1650     0.1152     0.1152
------------------------------------------------------------------------
WB  RIGHT (R)     210          0 *     1650     0.0000
    THRU (T)      100        100       1650     0.0606
    LEFT (L)      260        260       1650     0.1576     0.1576
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                           0.85
     INTERSECTION LEVEL OF SERVICE:                              D
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025WP.AMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 With Project PM Peak Hour       10/24/07
========================================================================
INTERSECTION     1 Canada Valley/Laurel Road
Count Date                    Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                         3-PHASE SIGNAL
-----------             0    0    0
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT     0 ---  0.0   0.0  0.0  0.0   0.0 ---    0  RIGHT
                                                      STREET NAME:
THRU   590 ---> 2.1  (NO. OF LANES)   2.0<---  850  THRU  Laurel Road

RIGHT  150 ---  1.1   1.0  0.0  1.0   1.0 ---  490  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                     SIG WARRANTS:
W + E                  40    0  320                       Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Canada Valley
========================================================================
               ORIGINAL   ADJUSTED                V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
NB  RIGHT (R)     320          0 *     1720     0.0000
    LEFT (L)       40         40       1720     0.0233     0.0233
------------------------------------------------------------------------
EB  RIGHT (R)     150        150       1720     0.0872
    THRU (T)      590        590       3440     0.1715
    T + R                    740       3440     0.2151     0.2151
------------------------------------------------------------------------
WB  THRU (T)      850        850       3440     0.2471
    LEFT (L)      490        490       1720     0.2849     0.2849
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                         0.52
     INTERSECTION LEVEL OF SERVICE:                            A
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025WP.PMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
=========================================================================
Condition: Antioch Davidon 2025 With Project PM Peak Hour      10/24/07
=========================================================================
INTERSECTION     2 Country Hills Dr/Laurel Road
Count Date                   Time                Peak Hour
-------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                         8-PHASE SIGNAL
-----------            40   20   50
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT    60 ---  1.0   1.1  1.1  1.0   1.1 ---  100  RIGHT
                                                            STREET NAME:
THRU   690 ---> 2.1  (NO. OF LANES)   2.1<--- 1170  THRU  Laurel Road

RIGHT  120 ---  1.1   1.0  1.1  1.1   1.0 ---  310  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                         SIG WARRANTS:
W + E                  90    0  170                           Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Country Hills Dr
=========================================================================
               ORIGINAL   ADJUSTED                V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
-------------------------------------------------------------------------
NB  RIGHT (R)     170        170       1650     0.1030     0.1030
    THRU (T)        0          0       1650     0.0000
    LEFT (L)       90         90       1650     0.0545
    T + R                    170       1650     0.1030
-------------------------------------------------------------------------
SB  RIGHT (R)      40         40       1650     0.0242
    THRU (T)       20         20       1650     0.0121
    LEFT (L)       50         50       1650     0.0303     0.0303
    T + R                     60       1650     0.0364
-------------------------------------------------------------------------
EB  RIGHT (R)     120        120       1650     0.0727
    THRU (T)      690        690       3300     0.2091
    LEFT (L)       60         60       1650     0.0364
    T + R                    810       3300     0.2455     0.2455
-------------------------------------------------------------------------
WB  RIGHT (R)     100        100       1650     0.0606
    THRU (T)     1170       1170       3300     0.3545
    LEFT (L)      310        310       1650     0.1879     0.1879
    T + R                   1270       3300     0.3848
=========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                         0.57
     INTERSECTION LEVEL OF SERVICE:                            A
=========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025WP.PMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 With Project PM Peak Hour       10/24/07
========================================================================
INTERSECTION     3 SR 4 Bypass SB/Laurel Road
Count Date                   Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                     2-PHASE SIGNAL
-----------           590    0  720
                        |    |    |
             ^          |    |    |         ^
             |       <---    v   --->       | Split? N
LEFT     0 ---  0.0   1.0  1.1  2.1   0.0 ---    0  RIGHT
                                                          STREET NAME:
THRU   870 ---> 2.1  (NO. OF LANES)   2.0<---  990  THRU  Laurel Road

RIGHT   40 ---  1.1   0.0  0.0  0.0   0.0 ---    0  LEFT
             |       <---    ^   --->       |
             v          |    |    |         v
  N                     |    |    |                       SIG WARRANTS:
W + E                   0    0    0                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: SR 4 Bypass SB
========================================================================
               ORIGINAL   ADJUSTED              V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO      V/C
------------------------------------------------------------------------
SB  RIGHT (R)     590        590       1800     0.3278     0.3278
    THRU (T)        0          0       1800     0.0000
    LEFT (L)      720        720       3273     0.2200
    T + L                    720       3273     0.2200
------------------------------------------------------------------------
EB  RIGHT (R)      40         40       1800     0.0222
    THRU (T)      870        870       3600     0.2417
    T + R                    910       3600     0.2528
------------------------------------------------------------------------
WB  THRU (T)      990        990       3600     0.2750     0.2750
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                           0.60
     INTERSECTION LEVEL OF SERVICE:                               A
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025WP.PMV,CAP=
```

CCTALOS Software ver. 2.35 by TJKM Transportation Consultants

```
========================================================================
Condition: Antioch Davidon 2025 With Project PM Peak Hour       10/24/07
========================================================================
INTERSECTION     4 SR 4 Bypass NB/Laurel Road
Count Date                   Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                        3-PHASE SIGNAL
-----------             0    0    0
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT   220 ---  1.0   0.0  0.0  0.0   1.0 ---  730  RIGHT
                                                          STREET NAME:
THRU  1370 ---> 2.0  (NO. OF LANES)   2.0<--- 1010  THRU  Laurel Road

RIGHT    0 ---  0.0   1.1  1.1  1.0   0.0 ---    0  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                       SIG WARRANTS:
W + E                  90    0  210                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: SR 4 Bypass NB
========================================================================
```

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB RIGHT (R)	210	210	1720	0.1221	0.1221
THRU (T)	0	0	1720	0.0000	
LEFT (L)	90	90	1720	0.0523	
T + L		90	1720	0.0523	
EB THRU (T)	1370	1370	3440	0.3983	
LEFT (L)	220	220	1720	0.1279	0.1279
WB RIGHT (R)	730	730	1720	0.4244	0.4244
THRU (T)	1010	1010	3440	0.2936	

TOTAL VOLUME-TO-CAPACITY RATIO: 0.67

INTERSECTION LEVEL OF SERVICE: B

* ADJUSTED FOR RIGHT TURN ON RED

INT=2025.INT,VOL=2025WP.PMV,CAP=

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 With Project PM Peak Hour       10/24/07
========================================================================
INTERSECTION     5 Slatten Ranch/Laurel Road
Count Date                   Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                          8-PHASE SIGNAL
-----------           110  410  230
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT   100 ---  1.0   1.1  2.1  1.0   1.1 ---  220  RIGHT
                                                             STREET NAME:
THRU  1190 ---> 3.0  (NO. OF LANES)   3.1<--- 1020  THRU  Laurel Road

RIGHT  290 ---  1.0   2.0  2.1  1.1   1.0 ---  260  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                          SIG WARRANTS:
W + E                 610  270  290                            Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Slatten Ranch
========================================================================
               ORIGINAL   ADJUSTED                 V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
NB  RIGHT (R)     290        290       1650     0.1758
    THRU (T)      270        270       3300     0.0818
    LEFT (L)      610        610       3000     0.2033     0.2033
    T + R                    560       3300     0.1697
------------------------------------------------------------------------
SB  RIGHT (R)     110        110       1650     0.0667
    THRU (T)      410        410       3300     0.1242
    LEFT (L)      230        230       1650     0.1394
    T + R                    520       3300     0.1576     0.1576
------------------------------------------------------------------------
EB  RIGHT (R)     290          0 *     1650     0.0000
    THRU (T)     1190       1190       4950     0.2404     0.2404
    LEFT (L)      100        100       1650     0.0606
------------------------------------------------------------------------
WB  RIGHT (R)     220        220       1650     0.1333
    THRU (T)     1020       1020       4950     0.2061
    LEFT (L)      260        260       1650     0.1576     0.1576
    T + R                   1240       4950     0.2505
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                           0.76
     INTERSECTION LEVEL OF SERVICE:                               C
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025WP.PMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 With Project PM Peak Hour       10/24/07
========================================================================
INTERSECTION     6 Live Oak Ave/Laurel Road
Count Date                   Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                          3-PHASE SIGNAL
-----------           290    0  130
                        |    |    |
             ^          |    |    |         ^
             |       <---    v   --->       | Split? N
LEFT   340 ---  2.0   1.0  0.0  1.0   1.1 ---   50  RIGHT
                                                          STREET NAME:
THRU  1370 ---> 3.0  (NO. OF LANES)   3.1<--- 1210  THRU  Laurel Road

RIGHT    0 ---  0.0   0.0  0.0  0.0   0.0 ---    0  LEFT
             |       <---    ^   --->       |
             v          |    |    |         v
  N                     |    |    |                       SIG WARRANTS:
W + E                   0    0    0                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Live Oak Ave
```

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
SB RIGHT (R)	290	103 *	1720	0.0599	
LEFT (L)	130	130	1720	0.0756	0.0756
EB THRU (T)	1370	1370	5160	0.2655	
LEFT (L)	340	340	3127	0.1087	0.1087
WB RIGHT (R)	50	50	1720	0.0291	
THRU (T)	1210	1210	5160	0.2345	
T + R		1260	5160	0.2442	0.2442

TOTAL VOLUME-TO-CAPACITY RATIO: 0.43

INTERSECTION LEVEL OF SERVICE: A

* ADJUSTED FOR RIGHT TURN ON RED

INT=2025.INT,VOL=2025WP.PMV,CAP=

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 With Project PM Peak Hour       10/24/07
========================================================================
INTERSECTION     7 Empire Ave/Laurel Road
Count Date                   Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                       8-PHASE SIGNAL
-----------           430  300   60
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT   430 ---  2.0   1.0  2.0  1.0   1.0 ---   50  RIGHT
                                                          STREET NAME:
THRU   910 ---> 2.0  (NO. OF LANES)   2.0<---  720  THRU  Laurel Road

RIGHT  160 ---  1.0   1.0  2.1  1.1   1.0 ---   50  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                       SIG WARRANTS:
W + E                 110  360   60                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Empire Ave
========================================================================
               ORIGINAL   ADJUSTED                  V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
NB  RIGHT (R)      60          60       1650     0.0364
    THRU (T)      360         360       3300     0.1091
    LEFT (L)      110         110       1650     0.0667     0.0667
    T + R                     420       3300     0.1273
------------------------------------------------------------------------
SB  RIGHT (R)     430         194 *     1650     0.1176     0.1176
    THRU (T)      300         300       3300     0.0909
    LEFT (L)       60          60       1650     0.0364
------------------------------------------------------------------------
EB  RIGHT (R)     160          50 *     1650     0.0303
    THRU (T)      910         910       3300     0.2758
    LEFT (L)      430         430       3000     0.1433     0.1433
------------------------------------------------------------------------
WB  RIGHT (R)      50           0 *     1650     0.0000
    THRU (T)      720         720       3300     0.2182     0.2182
    LEFT (L)       50          50       1650     0.0303
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                          0.55
     INTERSECTION LEVEL OF SERVICE:                              A
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025WP.PMV,CAPd=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 With Project PM Peak Hour       10/24/07
========================================================================
INTERSECTION     8 Canada Valley/Lone Tree Way
Count Date                   Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                       8-PHASE SIGNAL
-----------           120   20  350
                        |    |   |
             ^          |    |   |         ^
             |        <---   v   --->      | Split? N
LEFT   130 ---  2.0   1.1  1.1  1.0   1.1 ---  500  RIGHT
                                                          STREET NAME:
THRU  1710 ---> 3.0  (NO. OF LANES)   3.1<--- 1090  THRU  Lone Tree Way

RIGHT   60 ---  1.0   1.0  1.0  1.0   2.0 ---  530  LEFT
             |        <---   ^   --->      |
             v          |    |   |         v
  N                     |    |   |                        SIG WARRANTS:
W + E                 220   20  360                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Canada Valley
========================================================================
               ORIGINAL   ADJUSTED                V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
NB  RIGHT (R)     360         69 *     1650     0.0418     0.0418
    THRU (T)       20         20       1650     0.0121
    LEFT (L)      220        220       1650     0.1333
------------------------------------------------------------------------
SB  RIGHT (R)     120        120       1650     0.0727
    THRU (T)       20         20       1650     0.0121
    LEFT (L)      350        350       1650     0.2121     0.2121
    T + R                    140       1650     0.0848
------------------------------------------------------------------------
EB  RIGHT (R)      60          0 *     1650     0.0000
    THRU (T)     1710       1710       4950     0.3455     0.3455
    LEFT (L)      130        130       3000     0.0433
------------------------------------------------------------------------
WB  RIGHT (R)     500        500       1650     0.3030
    THRU (T)     1090       1090       4950     0.2202
    LEFT (L)      530        530       3000     0.1767     0.1767
    T + R                   1590       4950     0.3212
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                         0.78
     INTERSECTION LEVEL OF SERVICE:                             C
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025WP.PMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 With Project PM Peak Hour       10/24/07
========================================================================
INTERSECTION     9 SR 4 Bypass SB/Lone Tree Way
Count Date                   Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                           3-PHASE SIGNAL
-----------           240    0  860
                        |    |    |
             ^          |    |    |         ^
             |       <---    v   --->       | Split? N
LEFT     0 ---  0.0   1.0  1.1  2.1   0.0 ---    0  RIGHT
                                                        STREET NAME:
THRU  2060 ---> 3.0  (NO. OF LANES)   3.0<--- 1880  THRU  Lone Tree Way

RIGHT  380 ---  1.0   0.0  0.0  0.0   2.0 ---  380  LEFT
             |       <---    ^   --->       |
             v          |    |    |         v
  N                     |    |    |                     SIG WARRANTS:
W + E                   0    0    0                       Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: SR 4 Bypass SB
========================================================================
               ORIGINAL   ADJUSTED                V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
SB  RIGHT (R)     240         240       1720     0.1395
    THRU (T)        0           0       1720     0.0000
    LEFT (L)      860         860       3127     0.2750     0.2750
    T + L                     860       3127     0.2750
------------------------------------------------------------------------
EB  RIGHT (R)     380         380       1720     0.2209
    THRU (T)     2060        2060       5160     0.3992     0.3992
------------------------------------------------------------------------
WB  THRU (T)     1880        1880       5160     0.3643
    LEFT (L)      380         380       3127     0.1215     0.1215
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                          0.80
     INTERSECTION LEVEL OF SERVICE:                              C
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025WP.PMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
=========================================================================
Condition: Antioch Davidon 2025 With Project PM Peak Hour       10/24/07
=========================================================================
INTERSECTION    10 SR 4 Bypass NB/Lone Tree Way
Count Date                   Time                Peak Hour
-------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                         3-PHASE SIGNAL
-----------             0    0    0
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT     0 ---  0.0   0.0  0.0  0.0   1.0 ---  730  RIGHT
                                                          STREET NAME:
THRU  2640 ---> 3.0  (NO. OF LANES)   3.0<--- 1710  THRU  Lone Tree Way

RIGHT  280 ---  1.0   2.0  1.0  1.0   2.0 ---   60  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                       SIG WARRANTS:
W + E                 550   50  340                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: SR 4 Bypass NB
=========================================================================
               ORIGINAL   ADJUSTED                 V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
-------------------------------------------------------------------------
NB  RIGHT (R)     340         307 *     1720     0.1785     0.1785
    THRU (T)       50          50       1720     0.0291
    LEFT (L)      550         550       3127     0.1759
-------------------------------------------------------------------------
EB  RIGHT (R)     280           0 *     1720     0.0000
    THRU (T)     2640        2640       5160     0.5116     0.5116
-------------------------------------------------------------------------
WB  RIGHT (R)     730         730       1720     0.4244
    THRU (T)     1710        1710       5160     0.3314
    LEFT (L)       60          60       3127     0.0192     0.0192
=========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                          0.71
     INTERSECTION LEVEL OF SERVICE:                             C
=========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025WP.PMV,CAP=
```

CCTALOS Software ver. 2.35 by TJKM Transportation Consultants

Condition: Antioch Davidon 2025 With Project PM Peak Hour   10/24/07

```
INTERSECTION    11 Slatten Ranch/Lone Tree Way
Count Date                   Time               Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                       8-PHASE SIGNAL
-----------           570  550   80
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT   470 ---  2.0   1.0  2.0  2.0   1.1 ---   60  RIGHT
                                                          STREET NAME:
THRU  1990 ---> 3.0  (NO. OF LANES)   3.1<--- 1510  THRU  Lone Tree Way

RIGHT  530 ---  1.0   2.0  2.1  1.1   1.0 ---   50  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                       SIG WARRANTS:
W + E                 400  370   80                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Slatten Ranch
```

	MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	80	80	1650	0.0485	
	THRU (T)	370	370	3300	0.1121	
	LEFT (L)	400	400	3000	0.1333	0.1333
	T + R		450	3300	0.1364	
SB	RIGHT (R)	570	312 *	1650	0.1891	0.1891
	THRU (T)	550	550	3300	0.1667	
	LEFT (L)	80	80	3000	0.0267	
EB	RIGHT (R)	530	310 *	1650	0.1879	
	THRU (T)	1990	1990	4950	0.4020	
	LEFT (L)	470	470	3000	0.1567	0.1567
WB	RIGHT (R)	60	60	1650	0.0364	
	THRU (T)	1510	1510	4950	0.3051	
	LEFT (L)	50	50	1650	0.0303	
	T + R		1570	4950	0.3172	0.3172

TOTAL VOLUME-TO-CAPACITY RATIO: 0.80

INTERSECTION LEVEL OF SERVICE: C

* ADJUSTED FOR RIGHT TURN ON RED

INT=2025.INT,VOL=2025WP.PMV,CAP=

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 With Project PM Peak Hour       10/24/07
========================================================================
INTERSECTION    12 Empire Ave/Lone Tree Way
Count Date                    Time               Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                        8-PHASE SIGNAL
-----------           220  220  310
                        |    |    |
             ^          |    |    |         ^
             |       <---    v   --->       | Split? N
LEFT   160 ---  1.0   1.1  2.1  1.0   1.0 ---  160  RIGHT
                                                          STREET NAME:
THRU  1390 ---> 3.0  (NO. OF LANES)   3.0<---  960  THRU  Lone Tree Way

RIGHT  600 ---  1.0   2.0  1.0  1.0   1.0 ---   20  LEFT
             |       <---    ^   --->       |
             v          |    |    |         v
  N                     |    |    |                       SIG WARRANTS:
W + E                 440  120   40                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Empire Ave
========================================================================
               ORIGINAL   ADJUSTED                V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
NB  RIGHT (R)      40          20 *     1650     0.0121
    THRU (T)      120         120       1650     0.0727
    LEFT (L)      440         440       3000     0.1467     0.1467
------------------------------------------------------------------------
SB  RIGHT (R)     220         220       1650     0.1333     0.1333
    THRU (T)      220         220       3300     0.0667
    LEFT (L)      310         310       1650     0.1879
    T + R                     440       3300     0.1333
------------------------------------------------------------------------
EB  RIGHT (R)     600         358 *     1650     0.2170
    THRU (T)     1390        1390       4950     0.2808     0.2808
    LEFT (L)      160         160       1650     0.0970
------------------------------------------------------------------------
WB  RIGHT (R)     160           0 *     1650     0.0000
    THRU (T)      960         960       4950     0.1939
    LEFT (L)       20          20       1650     0.0121     0.0121
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                          0.57
     INTERSECTION LEVEL OF SERVICE:                              A
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025WP.PMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 With Project PM Peak Hour       10/24/07
========================================================================
INTERSECTION    13 Deer Valley Rd/Lone Tree Way
Count Date                     Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                           8-PHASE SIGNAL
-----------           150  510  310
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT   320 ---  1.0   1.1  2.1  1.0   1.1 ---  160  RIGHT
                                                          STREET NAME:
THRU  1850 ---> 3.1  (NO. OF LANES)   3.1<--- 1440  THRU  Lone Tree Way

RIGHT  190 ---  1.1   2.0  2.1  1.1   1.0 ---  190  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                       SIG WARRANTS:
W + E                 260  400  180                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Deer Valley Rd
========================================================================
```

	MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	180	180	1650	0.1091	
	THRU (T)	400	400	3300	0.1212	
	LEFT (L)	260	260	3000	0.0867	
	T + R		580	3300	0.1758	0.1758
SB	RIGHT (R)	150	150	1650	0.0909	
	THRU (T)	510	510	3300	0.1545	
	LEFT (L)	310	310	1650	0.1879	0.1879
	T + R		660	3300	0.2000	
EB	RIGHT (R)	190	190	1650	0.1152	
	THRU (T)	1850	1850	4950	0.3737	
	LEFT (L)	320	320	1650	0.1939	
	T + R		2040	4950	0.4121	0.4121
WB	RIGHT (R)	160	160	1650	0.0970	
	THRU (T)	1440	1440	4950	0.2909	
	LEFT (L)	190	190	1650	0.1152	0.1152
	T + R		1600	4950	0.3232	

TOTAL VOLUME-TO-CAPACITY RATIO: 0.89

INTERSECTION LEVEL OF SERVICE: D

* ADJUSTED FOR RIGHT TURN ON RED

INT=2025.INT,VOL=2025WP.PMV,CAP=

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 With Project PM Peak Hour       10/24/07
========================================================================
INTERSECTION    14 Hillcrest Ave/Lone Tree Way
Count Date                   Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                       8-PHASE SIGNAL
-----------           450  120  580
                        |   |   |
             ^          |   |   |         ^
             |       <---   v   --->      | Split? N
LEFT   710 ---  1.0   1.0  2.1  2.1   1.0 ---  480  RIGHT
                                                          STREET NAME:
THRU  1650 ---> 3.1  (NO. OF LANES)   3.0<--- 1390  THRU  Lone Tree Way

RIGHT   80 ---  1.1   1.0  2.1  1.1   1.0 ---  100  LEFT
             |       <---   ^   --->      |
             v          |   |   |         v
  N                     |   |   |                         SIG WARRANTS:
W + E                  50   70   60                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? Y

               STREET NAME: Hillcrest Ave
========================================================================
               ORIGINAL   ADJUSTED                V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
NB  RIGHT (R)      60          60       1650     0.0364
    THRU (T)       70          70       3300     0.0212
    LEFT (L)       50          50       1650     0.0303
    T + R                     130       3300     0.0394     0.0394
------------------------------------------------------------------------
SB  RIGHT (R)     450           0 *     1650     0.0000
    THRU (T)      120         120       3300     0.0364
    LEFT (L)      580         580       3000     0.1933     0.1933
    T + L                     700       4650     0.1505
------------------------------------------------------------------------
EB  RIGHT (R)      80          80       1650     0.0485
    THRU (T)     1650        1650       4950     0.3333
    LEFT (L)      710         710       1650     0.4303     0.4303
    T + R                    1730       4950     0.3495
------------------------------------------------------------------------
WB  RIGHT (R)     480         161 *     1650     0.0976
    THRU (T)     1390        1390       4950     0.2808     0.2808
    LEFT (L)      100         100       1650     0.0606
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                            0.94
     INTERSECTION LEVEL OF SERVICE:                                E
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025WP.PMV,CAPA=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 With Project PM Peak Hour       10/24/07
========================================================================
INTERSECTION    15 Vista Grande Dr/Lone Tree Way
Count Date                    Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                       5-PHASE SIGNAL
-----------           170   40   70
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT   190 ---  1.0   1.1  1.1  1.0   1.0 ---   90  RIGHT
                                                          STREET NAME:
THRU  1710 ---> 3.0  (NO. OF LANES)   3.0<--- 1240  THRU  Lone Tree Way

RIGHT  390 ---  1.0   1.0  1.0  1.0   1.0 ---  300  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                       SIG WARRANTS:
W + E                 320   50  220                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Vista Grande Dr
========================================================================
               ORIGINAL   ADJUSTED                V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
NB  RIGHT (R)     220          0 *     1650     0.0000
    THRU (T)       50         50       1650     0.0303
    LEFT (L)      320        320       1650     0.1939     0.1939
------------------------------------------------------------------------
SB  RIGHT (R)     170        170       1650     0.1030
    THRU (T)       40         40       1650     0.0242
    LEFT (L)       70         70       1650     0.0424
    T + R                    210       1650     0.1273     0.1273
------------------------------------------------------------------------
EB  RIGHT (R)     390         70 *     1650     0.0424
    THRU (T)     1710       1710       4950     0.3455     0.3455
    LEFT (L)      190        190       1650     0.1152
------------------------------------------------------------------------
WB  RIGHT (R)      90         20 *     1650     0.0121
    THRU (T)     1240       1240       4950     0.2505
    LEFT (L)      300        300       1650     0.1818     0.1818
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                         0.85
     INTERSECTION LEVEL OF SERVICE:                            D
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025WP.PMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 With Project PM Peak Hour       10/24/07
========================================================================
INTERSECTION    16 Hillcrest/Country Hills
Count Date                   Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                       8-PHASE SIGNAL
-----------            80  920  110
                        |   |   |
             ^          |   |   |         ^
             |       <---   v   --->      | Split? N
LEFT    70 ---  1.0   1.1  2.1  1.0   1.1 ---   90  RIGHT
                                                          STREET NAME:
THRU    20 ---> 1.0  (NO. OF LANES)   1.1<---   50  THRU  Country Hills

RIGHT  100 ---  1.0   1.0  2.1  1.1   1.0 ---  120  LEFT
             |       <---   ^   --->      |
             v          |   |   |         v
  N                     |   |   |                         SIG WARRANTS:
W + E                 100 1060   70                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Hillcrest
========================================================================
               ORIGINAL   ADJUSTED                V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
NB  RIGHT (R)      70         70       1650     0.0424
    THRU (T)     1060       1060       3300     0.3212
    LEFT (L)      100        100       1650     0.0606
    T + R                   1130       3300     0.3424     0.3424
------------------------------------------------------------------------
SB  RIGHT (R)      80         80       1650     0.0485
    THRU (T)      920        920       3300     0.2788
    LEFT (L)      110        110       1650     0.0667     0.0667
    T + R                   1000       3300     0.3030
------------------------------------------------------------------------
EB  RIGHT (R)     100          0 *     1650     0.0000
    THRU (T)       20         20       1650     0.0121
    LEFT (L)       70         70       1650     0.0424     0.0424
------------------------------------------------------------------------
WB  RIGHT (R)      90         90       1650     0.0545
    THRU (T)       50         50       1650     0.0303
    LEFT (L)      120        120       1650     0.0727
    T + R                    140       1650     0.0848     0.0848
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                            0.54
     INTERSECTION LEVEL OF SERVICE:                                A
========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025WP.PMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
=========================================================================
Condition: Antioch Davidon 2025 With Project PM Peak Hour       10/24/07
=========================================================================
INTERSECTION    18 Hillcrest/Laurel
Count Date                    Time                Peak Hour
-------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                          8-PHASE SIGNAL
-----------           220  910  290
                        |    |    |
             ^          |    |    |         ^
             |       <---    v   --->       | Split? N
LEFT   140 ---  1.0   1.1  2.1  1.0   1.0 ---  250  RIGHT
                                                          STREET NAME:
THRU    80 ---> 1.1  (NO. OF LANES)   1.0<---  210  THRU  Laurel

RIGHT  110 ---  1.1   1.0  2.1  1.1   1.0 ---  350  LEFT
             |       <---    ^   --->       |
             v          |    |    |         v
  N                     |    |    |                       SIG WARRANTS:
W + E                  90  970  290                         Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Hillcrest
=========================================================================
               ORIGINAL   ADJUSTED               V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO      V/C
-------------------------------------------------------------------------
NB  RIGHT (R)     290         290       1650     0.1758
    THRU (T)      970         970       3300     0.2939
    LEFT (L)       90          90       1650     0.0545
    T + R                    1260       3300     0.3818     0.3818
-------------------------------------------------------------------------
SB  RIGHT (R)     220         220       1650     0.1333
    THRU (T)      910         910       3300     0.2758
    LEFT (L)      290         290       1650     0.1758     0.1758
    T + R                    1130       3300     0.3424
-------------------------------------------------------------------------
EB  RIGHT (R)     110         110       1650     0.0667
    THRU (T)       80          80       1650     0.0485
    LEFT (L)      140         140       1650     0.0848
    T + R                     190       1650     0.1152     0.1152
-------------------------------------------------------------------------
WB  RIGHT (R)     250           0 *     1650     0.0000
    THRU (T)      210         210       1650     0.1273
    LEFT (L)      350         350       1650     0.2121     0.2121
=========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                           0.88
     INTERSECTION LEVEL OF SERVICE:                              D
=========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025.INT,VOL=2025WP.PMV,CAPA=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
=========================================================================
Condition: Antioch Davidon 2025 AM Peak Hour Mitigated          10/24/07
=========================================================================
INTERSECTION    14 Hillcrest Ave/Lone Tree Way
Count Date                    Time                Peak Hour
-------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                          8-PHASE SIGNAL
-----------           470   40  380
                        |    |   |
             ^          |    |   |         ^
             |       <---    v   --->      | Split? N
LEFT   290 ---  2.0   1.0  1.0  2.0   1.0 ---  400  RIGHT
                                                             STREET NAME:
THRU   810 ---> 3.1  (NO. OF LANES)   3.0<--- 1310  THRU   Lone Tree Way

RIGHT   30 ---  1.1   1.0  2.1  1.1   1.0 ---   40  LEFT
             |       <---    ^   --->      |
             v          |    |   |         v
  N                     |    |   |                           SIG WARRANTS:
W + E                  80   70   80                            Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Hillcrest Ave
=========================================================================
               ORIGINAL   ADJUSTED                V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
-------------------------------------------------------------------------
NB  RIGHT (R)      80          80       1650     0.0485
    THRU (T)       70          70       3300     0.0212
    LEFT (L)       80          80       1650     0.0485     0.0485
    T + R                     150       3300     0.0455
-------------------------------------------------------------------------
SB  RIGHT (R)     470         311 *     1650     0.1885     0.1885
    THRU (T)       40          40       1650     0.0242
    LEFT (L)      380         380       3000     0.1267
-------------------------------------------------------------------------
EB  RIGHT (R)      30          30       1650     0.0182
    THRU (T)      810         810       4950     0.1636
    LEFT (L)      290         290       3000     0.0967     0.0967
    T + R                     840       4950     0.1697
-------------------------------------------------------------------------
WB  RIGHT (R)     400         191 *     1650     0.1158
    THRU (T)     1310        1310       4950     0.2646     0.2646
    LEFT (L)       40          40       1650     0.0242
=========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                          0.60
     INTERSECTION LEVEL OF SERVICE:                              A
=========================================================================
* ADJUSTED FOR RIGHT TURN ON RED
INT=2025MIT.INT,VOL=2025WP.AMV,CAP=
```

```
CCTALOS Software ver. 2.35 by TJKM Transportation Consultants
========================================================================
Condition: Antioch Davidon 2025 PM Peak Hour Mitigated          10/23/07
========================================================================
INTERSECTION    14 Hillcrest Ave/Lone Tree Way
Count Date                   Time                Peak Hour
------------------------------------------------------------------------
CCTA METHOD         RIGHT THRU LEFT                         8-PHASE SIGNAL
-----------           450  120  580
                        |    |    |
             ^          |    |    |         ^
             |       <---    v    --->      | Split? N
LEFT   710 ---  2.0   1.0  1.0  2.0   1.0 ---  480  RIGHT
                                                            STREET NAME:
THRU  1650 ---> 3.1  (NO. OF LANES)   3.0<--- 1390  THRU   Lone Tree Way

RIGHT   80 ---  1.1   1.0  2.1  1.1   1.0 ---  100  LEFT
             |       <---    ^    --->      |
             v          |    |    |         v
  N                     |    |    |                         SIG WARRANTS:
W + E                  50   70   60                           Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N

               STREET NAME: Hillcrest Ave
========================================================================
               ORIGINAL   ADJUSTED                V/C     CRITICAL
   MOVEMENT     VOLUME     VOLUME*   CAPACITY    RATIO       V/C
------------------------------------------------------------------------
NB  RIGHT (R)      60          60       1650     0.0364
    THRU (T)       70          70       3300     0.0212
    LEFT (L)       50          50       1650     0.0303
    T + R                     130       3300     0.0394     0.0394
------------------------------------------------------------------------
SB  RIGHT (R)     450          60 *     1650     0.0364
    THRU (T)      120         120       1650     0.0727
    LEFT (L)      580         580       3000     0.1933     0.1933
------------------------------------------------------------------------
EB  RIGHT (R)      80          80       1650     0.0485
    THRU (T)     1650        1650       4950     0.3333
    LEFT (L)      710         710       3000     0.2367     0.2367
    T + R                    1730       4950     0.3495
------------------------------------------------------------------------
WB  RIGHT (R)     480         161 *     1650     0.0976
    THRU (T)     1390        1390       4950     0.2808     0.2808
    LEFT (L)      100         100       1650     0.0606
========================================================================
     TOTAL VOLUME-TO-CAPACITY RATIO:                          0.75
     INTERSECTION LEVEL OF SERVICE:                              C
===================================================
```

APPENDIX D:

Lone Tree Way/Canada Valley Road

Queuing Reports

FEHR & PEERS
TRANSPORTATION CONSULTANTS

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	32	829	58	184	1117	187	40	39	34	211	34	38
v/c Ratio	0.30	0.26	0.06	0.57	0.32	0.16	0.23	0.36	0.30	0.76	0.11	0.13
Control Delay	53.3	8.3	2.9	68.6	6.6	1.1	62.0	31.8	18.3	57.4	43.6	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.3	8.3	2.9	68.6	6.6	1.1	62.0	31.8	18.3	57.4	43.6	12.4
Queue Length 50th (ft)	27	61	3	77	93	1	17	13	0	173	25	0
Queue Length 95th (ft)	m48	68	m11	119	150	10	37	52	35	244	52	30
Internal Link Dist (ft)		900			775			542			1064	
Turn Bay Length (ft)	300		120	300			150			170		
Base Capacity (vph)	123	3137	992	401	3447	1134	185	525	498	381	889	775
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.26	0.06	0.46	0.32	0.16	0.22	0.07	0.07	0.55	0.04	0.05

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	56	1410	57	343	981	264	88	122	115	182	58	23
v/c Ratio	0.41	0.53	0.07	0.68	0.32	0.25	0.29	0.58	0.44	0.79	0.19	0.08
Control Delay	58.9	22.9	15.3	69.7	8.6	1.4	58.6	33.5	8.8	69.4	42.9	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.9	22.9	15.3	69.7	8.6	1.4	58.6	33.5	8.8	69.4	42.9	13.4
Queue Length 50th (ft)	42	226	10	148	78	0	37	66	0	148	43	0
Queue Length 95th (ft)	m61	324	m23	159	162	21	64	115	51	#245	71	22
Internal Link Dist (ft)		905			760			542			1064	
Turn Bay Length (ft)	300		120	300			150			170		
Base Capacity (vph)	150	2671	834	532	3093	1044	363	508	521	259	645	554
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.53	0.07	0.64	0.32	0.25	0.24	0.24	0.22	0.70	0.09	0.04

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	32	829	58	184	1117	187	40	39	34	119	126	38
v/c Ratio	0.40	0.26	0.06	0.57	0.31	0.16	0.21	0.35	0.30	0.51	0.53	0.15
Control Delay	63.1	6.3	1.5	64.6	5.2	0.6	58.2	31.8	18.4	52.4	52.6	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.1	6.3	1.5	64.6	5.2	0.6	58.2	31.8	18.4	52.4	52.6	14.1
Queue Length 50th (ft)	28	49	3	67	87	1	17	13	0	98	105	0
Queue Length 95th (ft)	m50	43	m6	120	98	6	36	52	35	160	167	32
Internal Link Dist (ft)		900			775			542			1064	
Turn Bay Length (ft)	300		120	300			150			170		
Base Capacity (vph)	82	3217	1016	349	3605	1176	1003	488	464	491	499	490
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.26	0.06	0.53	0.31	0.16	0.04	0.08	0.07	0.24	0.25	0.08

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	56	1410	57	343	981	264	88	122	115	117	123	23
v/c Ratio	0.49	0.61	0.08	0.49	0.32	0.25	0.30	0.67	0.49	0.44	0.45	0.09
Control Delay	63.7	28.4	17.1	52.7	8.6	1.0	54.5	36.4	10.3	48.4	48.5	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.7	28.4	17.1	52.7	8.6	1.0	54.5	36.4	10.3	48.4	48.5	13.7
Queue Length 50th (ft)	43	226	10	128	72	0	36	66	0	97	103	0
Queue Length 95th (ft)	m63	#558	m23	150	179	13	60	132	58	134	140	22
Internal Link Dist (ft)		905			760			542			1064	
Turn Bay Length (ft)	300		120	300			150			170		
Base Capacity (vph)	123	2324	727	703	3107	1048	1003	508	521	491	504	472
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.61	0.08	0.49	0.32	0.25	0.09	0.24	0.22	0.24	0.24	0.05

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	32	1079	72	234	1243	187	84	118	102	211	34	38
v/c Ratio	0.36	0.36	0.08	0.62	0.36	0.17	0.30	0.62	0.55	0.77	0.12	0.14
Control Delay	57.9	9.6	3.8	73.6	6.9	1.5	61.1	15.6	11.4	59.4	43.8	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.9	9.6	3.8	73.6	6.9	1.5	61.1	15.6	11.4	59.4	43.8	12.4
Queue Length 50th (ft)	28	72	2	103	89	1	35	13	0	172	25	0
Queue Length 95th (ft)	m49	130	20	148	188	14	63	77	57	249	51	29
Internal Link Dist (ft)		900			775			542			1064	
Turn Bay Length (ft)	300		120	300			150			170		
Base Capacity (vph)	95	2965	940	418	3406	1122	283	533	523	354	817	715
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.36	0.08	0.56	0.36	0.17	0.30	0.22	0.20	0.60	0.04	0.05

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	56	1652	104	500	1308	264	115	167	163	182	58	23
v/c Ratio	0.41	0.67	0.13	0.76	0.42	0.25	0.34	0.65	0.50	0.90	0.20	0.09
Control Delay	55.2	22.7	13.3	70.2	10.4	2.9	58.3	28.7	7.5	96.9	44.5	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.2	22.7	13.3	70.2	10.4	2.9	58.3	28.7	7.5	96.9	44.5	13.7
Queue Length 50th (ft)	41	250	8	212	77	0	48	78	0	154	44	0
Queue Length 95th (ft)	m61	#488	m49	#295	272	m53	79	131	57	#292	71	22
Internal Link Dist (ft)		905			760			542			1064	
Turn Bay Length (ft)	300		120	300			150			170		
Base Capacity (vph)	150	2451	775	657	3104	1047	375	520	555	204	588	507
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.67	0.13	0.76	0.42	0.25	0.31	0.32	0.29	0.89	0.10	0.05

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	32	1079	72	234	1243	187	84	118	102	119	126	38
v/c Ratio	0.59	0.36	0.08	0.59	0.36	0.16	0.37	0.60	0.52	0.51	0.53	0.15
Control Delay	88.4	7.2	1.6	63.2	6.5	0.5	57.5	15.6	11.4	52.4	52.6	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.4	7.2	1.6	63.2	6.5	0.5	57.5	15.6	11.4	52.4	52.6	14.1
Queue Length 50th (ft)	28	67	2	86	103	0	35	13	0	98	105	0
Queue Length 95th (ft)	m#58	139	7	134	115	5	61	77	57	160	167	32
Internal Link Dist (ft)		900			775			542			1064	
Turn Bay Length (ft)	300		120	300			150			170		
Base Capacity (vph)	54	2988	946	395	3471	1137	1003	522	512	491	499	490
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.36	0.08	0.59	0.36	0.16	0.08	0.23	0.20	0.24	0.25	0.08

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	56	1652	104	500	1308	264	115	167	163	117	123	23
v/c Ratio	0.82	0.98	0.19	0.46	0.42	0.25	0.34	0.74	0.55	0.44	0.45	0.09
Control Delay	106.7	48.2	14.4	44.8	8.1	1.2	53.6	31.6	8.9	48.4	48.5	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	106.7	48.2	14.4	44.8	8.1	1.2	53.6	31.6	8.9	48.4	48.5	13.7
Queue Length 50th (ft)	47	293	14	194	86	0	47	78	0	97	103	0
Queue Length 95th (ft)	m#84	#742	m34	213	221	m8	74	154	68	134	140	22
Internal Link Dist (ft)		905			760			542			1064	
Turn Bay Length (ft)	300		120	300			150			170		
Base Capacity (vph)	68	1687	543	1094	3112	1038	1003	520	555	491	504	472
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.98	0.19	0.46	0.42	0.25	0.11	0.32	0.29	0.24	0.24	0.05

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	54	1079	72	234	1243	259	84	118	102	429	34	104
v/c Ratio	0.59	0.39	0.08	0.62	0.40	0.24	0.42	0.62	0.55	1.21	0.09	0.26
Control Delay	70.4	11.1	3.8	72.4	8.8	1.7	64.7	15.6	11.4	162.7	41.5	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.4	11.1	3.8	72.4	8.8	1.7	64.7	15.6	11.4	162.7	41.5	7.9
Queue Length 50th (ft)	47	72	2	105	105	1	35	13	0	~441	24	0
Queue Length 95th (ft)	m#90	128	20	146	197	26	63	77	57	#648	51	47
Internal Link Dist (ft)		900			775			542			1064	
Turn Bay Length (ft)	300		120	300			150			170		
Base Capacity (vph)	95	2736	871	418	3095	1065	211	533	523	354	817	752
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.39	0.08	0.56	0.40	0.24	0.40	0.22	0.20	1.21	0.04	0.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	127	1652	104	500	1308	494	115	167	163	318	58	65
v/c Ratio	0.85	0.68	0.13	0.76	0.44	0.44	0.34	0.65	0.50	1.56	0.20	0.22
Control Delay	84.8	22.7	13.3	67.2	12.4	3.5	58.2	28.7	7.5	311.5	44.5	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.8	22.7	13.3	67.2	12.4	3.5	58.2	28.7	7.5	311.5	44.5	9.3
Queue Length 50th (ft)	101	235	8	213	95	0	48	78	0	~378	44	0
Queue Length 95th (ft)	m#194	#487	m49	m272	m298	m95	79	131	57	#565	71	35
Internal Link Dist (ft)		905			760			542			1064	
Turn Bay Length (ft)	300		120	300			150			170		
Base Capacity (vph)	150	2446	773	656	2989	1113	379	520	555	204	588	536
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.68	0.13	0.76	0.44	0.44	0.30	0.32	0.29	1.56	0.10	0.12

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

APPENDIX D:

Vista Grande/Canada Valley/Pinnacle View Way

Signal Warrant Worksheet

Warrant 3B: Peak Hour Volume

The peak hour volume warrant is satisfied when the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour of the higher volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day falls above the curve in Figure 4-5 for the existing combination of approach lanes.

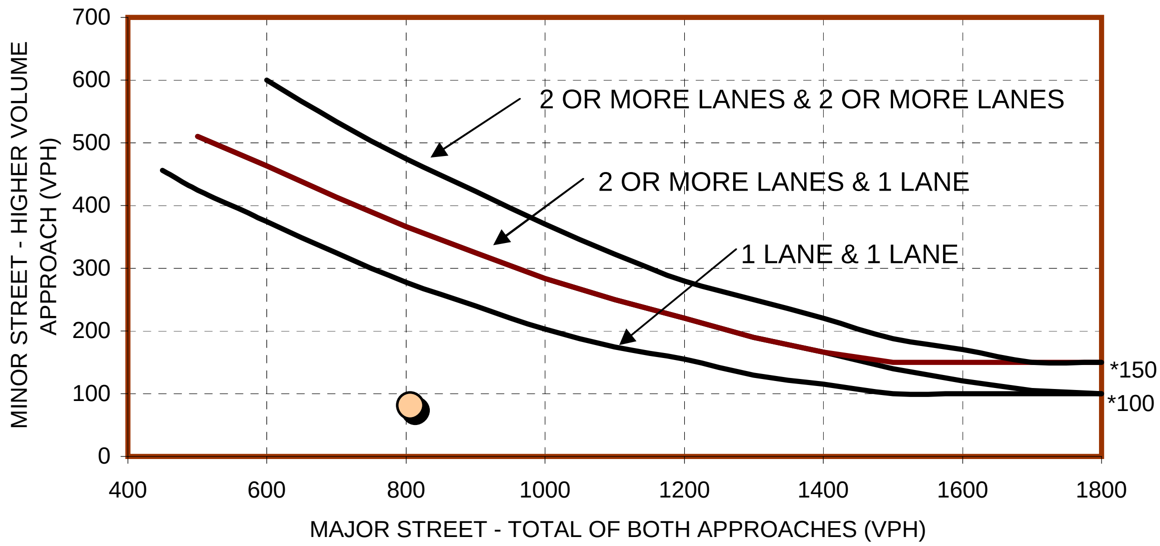
Analysis

	No of lanes
Major Street	1
Minor Street	1

Peak Hour

Time	Vehicles Per Hour	
	Major Street (Sum of both approaches)	Minor street (High volume approach)
8:00 AM	807	81

FIGURE 4C-3. PEAK HOUR VOLUME WARRANT



*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for minor street approach with one or lane.

Peak Hour

Warrant **NOT MET**

Warrant 3B: Peak Hour Volume

The peak hour volume warrant is satisfied when the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour of the higher volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day falls above the curve in Figure 4-5 for the existing combination of approach lanes.

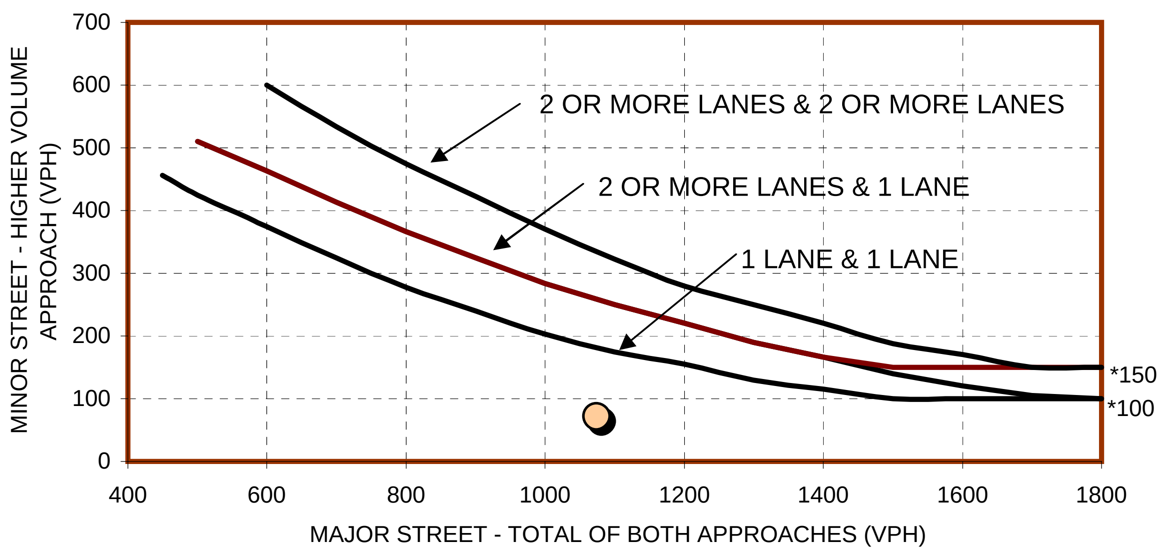
Analysis

	No of lanes
Major Street	1
Minor Street	1

Peak Hour

Time	Vehicles Per Hour	
	Major Street (Sum of both approaches)	Minor street (High volume approach)
5:00 PM	1,074	71

FIGURE 4C-3. PEAK HOUR VOLUME WARRANT



*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume foi minor street approach with one or lane.

Warrant **NOT MET**

Appendix B

Biological Assessment

BIOLOGICAL ASSESSMENT

DAVIDON SUBDIVISION 8846
ANTIOCH, CONTRA COSTA COUNTY
CALIFORNIA

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October 19, 2007

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SUMMARY

The Davidon Subdivision 8846 property, consisting of portions of the former R. Jacuzzi and V. Jacuzzi Ranch properties, contains approximately 171 acres of undeveloped land located north of Lone Tree Way, west of Neroly Road, and south of the Contra Costa Canal, south of Highway 4, within eastern Contra Costa County, California. The northern boundary is formed by lands of the approved Laurel Ranch subdivision (Bixby Company LLC), the eastern boundary is formed by lands owned by the State Route 4 Bypass Authority, the western boundary by an established residential subdivision, and the southern boundary is formed by the residential development of the Sand Creek Ranch (Shea Homes). Northeast of the project site is the old V. Jacuzzi homestead (owned by Deliza Ranch LLC).

Wildlife Research Associates conducted this revised biological assessment of the proposed project to assess the potential for the presence of special-status biological resources and to evaluate the potential biological constraints to the proposed project.

Habitats within the Davidon Subdivision 8846 property (the "subject property") have been altered as the result of cattle grazing, orchard removal, and annual disking of non-native grasslands and ruderal habitat.

A review of the California Natural Diversity Data Base (CNDDB 2007), revealed that a total of 6 special status vegetation communities, 31 special-status plant species and 45 special status animal species have been reported within the region of the study area. One special-status vegetation community, coastal and valley freshwater marsh, occurs within the project site on the southwestern portion of the site. Please refer to *Wetland Delineation, Southwest Corner of Rolling Hills Ranch* (Michael Wood Biological Consulting 2002) for further details.

None of the special-status plant species are considered to have any potential for occurrence within the study area, due to a lack of suitable habitat, or the fact that they would have been recognizable during previous surveys (Michael Brandman Associates 2003).

Several special status animal species either have potential to occur or occur on the property or adjacent lands. One California special concern species, the western burrowing owl (*Athene cunicularia hypugea*), is known to nest on the subject property (CNDDB 2007). One state-listed fully-protected bird species, the white-tailed kite (*Elanus caeruleus*) is known to nest on the Deliza Ranch parcel (CNDDB 2007). Two other bird species; loggerhead shrike (*Lanius ludovicianus*) and American kestrel *(Falco sparverius*) are also known to nest on the Deliza Ranch (CNDDB 2007) and are protected under Fish and Game Code Section 3503.5. Burrowing owls were also documented on the Deliza Ranch on lands that were acquired and mitigated for by the State Route 4 Bypass Authority for Segment 1 of the State Route 4 Bypass (Loewke 2003). Other raptor (birds of prey) species, including northern harrier (*Circus cyaneus*), and red-tailed hawk (*Buteo jamaicensis*) are considered to have a moderate potential to occur within the study area, based on the presence of suitable nesting habitat (grasslands and trees). Several passerine (perching bird) species, including western meadowlark (*Sturnella neglecta*), may be nesting on the site in the non-native grasslands.

Surveys were conducted in 2005 to identify the location and population of burrowing owls utilizing the site for nesting and foraging purposes. The surveys were followed by a CDFG-authorized banding of owls, which lead to the identification of 2 adult and 7 juvenile owls within the southwesterly corner of the site. Based on this documentation, the project sponsor, Davidon Homes, implemented mitigation for the loss of corresponding nesting and foraging habitat

through purchase of 19.5 burrowing owl conservation credits in the CDFG-approved Haera Wildlife Conservation Bank, operated by Wildlands, Inc. Owls were subsequently excluded from the southwesterly portion of the site in accordance with CDFG authorized procedures.

To avoid impacts to special-status nesting passerine and raptor species prior to project ground breaking, we recommend the following actions:

- Remove remaining suitable nesting habitat prior to the nesting season (February 1 through August 31).
- Conduct pre-construction surveys for nesting raptors and passerines. If any of the aforementioned species are present, construction shall be delayed until after the nesting season (February-August).

Please refer to the mitigation measures at the end of this document for more details.

1.0 INTRODUCTION

Wildlife Research Associates was contracted by Mr. Richard T. Loewke to prepare a biological assessment of the approximate 171-acre Davidon Subdivision 8846 property located in the eastern portion of the City of Antioch, Contra Costa County, California (Figure 1). The Davidon Subdivision property consists of undeveloped land, and is located north of Lone Tree Way, west of Neroly Road, south of the Contra Costa Canal and Highway 4, and west of the State Route 4 Bypass Segment 1. The northern boundary is formed by lands Laurel Ranch subdivision (Bixby Company LLC), the eastern boundary is formed by lands owned by the State Route 4 Bypass Authority. The southern boundary abuts the Sand Creek Ranch development, built in 2005 by Shea Homes. Additional residential development occurs on the western boundary along Canada Valley Road, and Segment 1 of the State Route 4 Bypass has recently been constructed adjoining the easterly boundary of the project.

This report presents the updated results of a reconnaissance-level survey of the study area, a discussion of the existing plant communities and wildlife habitats on-site, the potential for occurrence of special-status natural communities, and special-status plant and animal species on-site, and identifies potential impacts and mitigation measures.

1.1 Project Description

The Davidon Subdivision project study area (APN 053-060-023 and 053-072-013) includes the following proposed uses: (a) approximately 91 acres of residential lots, 27 acres of open space, 8 acres of community park, and 37 acres of major roads. An additional 7 acres are identified as remainder parcels.

2.0 METHODS AND LIMITATIONS

Information on special-status plant species was compiled through a review of the California Natural Diversity Data Base (CNDDB) (CNDDB 2007) for the Antioch North, Antioch South, Brentwood, and Jersey Island 7.5-minute U.S. Geological Survey (USGS) topographic quadrangles, the California Native Plant Society's (CNPS) Inventory of Rare and Endangered Vascular Plants of California (Skinner and Pavlik 1999), the California Department of Fish and Game’s (CDFG) Special Plants List (CDFG 2007a) and the USFWS list of special-status plants (USFWS 2007).

A list of special-status wildlife species known or expected to occur on the site was compiled through a review of the CNDDB (CNDDB 2007), the CDFG’s Special Animals List (CDFG 2007b), State and Federally Listed Endangered and Threatened Animals of California (CDFG 2007c) and the USFWS list of special-status animals (USFWS 2007).

A site visit was conducted on September 20, 2007 by Wildlife Research Associates ecologist Trish Tatarian. The reconnaissance-level site visit was intended only as an initial evaluation of on-site and adjacent habitat types. For the purposes of this report, the property consists of all lands within the property boundaries (approximately 171- acres) and will be referred to as the study area.

Focused surveys for western burrowing owl were conducted in 2005, 2006 and 2007 in the southwest corner of the project site (see below). Focused surveys for other special-status wildlife species were not conducted as part of this effort.

Reports reviewed for this project include the *Biological Resources Assessment, Laurel Ranch Subdivision, Contra Costa County, California* (Michael Brandman Associates 2003), *State Route 4 Bypass Project, Biological Assessment* (Wildlife Research Associates 2003), *Highway 4 Bypass Rare Plants* (Wood Biological Consulting 2003b), *Wetland Delineation, Southwest Corner of Rolling Hills Ranch* (Michael Wood Biological Consulting 2002), *Lindsey Basin: Biological Constraints Analysis* (Environmental Science Associates (ESA) 1994a), *State Route 4 Bypass Project, Final Environmental Impact Report* (ESA 1994b), *Habitat Assessment for California Red-legged Frog* (ESA) 1998a), the Draft EIR for *Future Urbanization Area #2 Specific Plan* (Mundie & Associates 1995), SR 4 Bypass Segment 1 Biological Assessment, as issued by the USFWS (USFWS 2005) and Section 1603 Agreement issued for Segment 1 of the SR 4 Bypass by the CDFG on May 10, 2005 (CDFG 2005).

3.0 EXISTING CONDITIONS

3.1 Setting

The study area is located within the San Francisco Bay/Delta Bioregion (Welsh 1994). This bioregion is located within central California and is located west of the interface of two significant freshwater systems, the Sacramento and San Joaquin Rivers. Habitats within this bioregion include both mesic (moist) habitats, such as freshwater marsh, and xeric (dry) habitats, such as open grasslands, and are typical of a Mediterranean climate. Annual winter precipitation averages 12 inches (Mundie and Associates 1995). The weather in the Antioch area is influenced by Mt. Diablo in the west, and the xeric regime is created by the adiabatic conditions influenced by the mountain.

Located approximately 11.5 miles northeast of Mt. Diablo, and approximately 2.7 miles south of the San Joaquin River, the study area is situated within the southeast corner of the City of Antioch in eastern Contra Costa County. The study area is located within Section 23, Township 2N and Range 2E on the Brentwood U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle map.

Approximately 171-acre**s** in size, the study area is, located south of the existing State Route 4 Highway, west of the new State Route 4 Bypass and north of Lone Tree Way. Ranging in elevations between 100 to 225 feet above sea level, the lands are comprised of south- and east-facing slopes. The central portion of the study area has been altered by off-road vehicle use. Historically, the Davidon Subdivision study area partially supported cattle grazing, orchards and row crops.

A small artificially created freshwater wetland occurs on the southwest corner of the study area. A temporary 48” reinforced concrete pipe outfall once lead onto the study area, conveying water from beneath Canada Valley Road (Michael Wood Biological Consulting 2002). This pipe has since been converted to carry storm water to the East Antioch Creek flood control channel.

3.2 Vegetation Communities

Although once supporting orchards in the eastern portion of the site, the dominant vegetation community on the site is non-native grassland and comprises approximately 171 acres. This community is typically composed of a dense to sparse cover of annual grasses, often associated with numerous species of annual and perennial forbs. These grasslands grow actively during winter and spring, remain dormant during summer and early fall, and persist only as seed until conditions are favorable for germination (Holland 1986). The presence of this assemblage of non-native, annual grasses originating in the Mediterranean region is a consequence of permanent alterations to the once widely distributed, pristine perennial grasslands of California. The conversion of native perennial grassland into non-native annual species has resulted from a combination of (1) invasion by alien plant species, (2) changes in the kinds of animals and their grazing patterns, (3) cultivation, and (4) fire regime (Heady 1988). Non-native grassland is generally found on fine-textured, clay-rich soils, which are moist to saturated during winter rains and dry during the summer and fall (Holland 1986). Scattered native wildflower species, representing remnants of the original vegetation, may also be common. Non-native annual grassland, such as found within the Rolling Hills Ranch study area, conforms to the California annual grassland series described in Sawyer and Keeler-Wolf (1995).

Non-native annual grasses of European origin make up the dominant species. On site, these include wild oats (*Avena fatua*), brome grasses (*Bromus* spp.), hare barley (*Hordeum murinum* ssp. *leporinum*), and annual ryegrass *(Lolium multiflorum*), among others. Common non-native forbs also detected include bristly ox-tongue (*Picris echiodides*), doveweed (*Eremocarpus setigerus*), yellow star thistle (*Centauria solstitialis*), hoary mustard (*Hirschfeldia incana*), prickly lettuce (*Lactuca serriola*), tarplant (*Hemizonia fitchii*), and curly dock (*Rumex crispus*), among others. Native forbs present within this community include common fiddleneck (*Amsinckia menziesii*), bellardia (*Bellardia trixago*) and bull thistle (*Cirsium vulgare*), species common in disturbed habitats.

Seasonal wetlands occurring on the site comprise of approximately 0.17 –acres and consist of annual and perennial native and non-native wetland associated plant species (Michael Wood Biological Consulting 2002). This vegetation community typically resembles a wetland community only following the wet season or when water is present. Please refer to the *Wetland Delineation, Southern Corner of Rolling Hills Ranch* (Wood Biological 2005) for further details. This wetland falls under the classification of coastal and valley freshwater marsh.

Species observed within the freshwater marsh on site included cattails (*Typha latifolia* and *T. angustifolia)*, as well as three-square (*Scirpus americanus*), toad rush (*Juncus bufonius*), umbrella sedge (*Cyperus eragrostis*) and loosestrife (*Lythrum hyssopifolia*) (Michael Wood Biological Consulting 2002).

3.3 Wildlife Habitats

Grassland habitat, including native and non-native grasslands, provides both primary habitat, such as nesting and foraging, and secondary habitat, such as a movement corridor. Reptiles, such as western fence lizard (*Sceloporus occidentalis*), can be found in this habitat, feeding on invertebrates found within and beneath debris. This habitat also attracts seed-eating and insect-eating species of birds and mammals. California quail (*Lophortyx californicus*), mourning dove (*Zenaidura macroura*), and meadowlark (*Sturnella neglecta*) are a few seed-eaters that nest and forage in grasslands. Insect-eaters such as scrub jay (*Aphelocoma coerulescens*) use the habitat for foraging only. Grasslands are important foraging grounds for aerial and ground foraging insect-eating bat species such as myotis (*Myotis* spp.) and pallid bat (*Antrozous pallidus*). A large number of other mammal species such as California vole (*Microtus californicus*), deer mouse (*Peromyscus maniculatus*), Botta's pocket gopher (*Thomomys bottae*), California ground squirrel (*Spermophilus beecheyi*) and California jackrabbit (*Lepus californicus*) also forage and nest within grasslands. Small rodents attract raptors (birds of prey) such as owls that hunt at night, as well as day-hunting raptors such as white-tailed kite (*Elanus leucureus*), and red-tailed hawk (*Buteo jamaicensis*), among others. On the project site, three different coyote (*Canis latrans*) have been observed.

Small, individual almond trees, remnants and volunteers from the previous orchards on site, once occurred throughout the grasslands areas. In 2006, many of these trees were removed with a subsequent removal follow-up in 2007.

The freshwater marsh on the site does not remain wet long enough to provide more than a few weeks of wildlife habitat. Nesting birds, such as red-winged blackbirds (*Agelaius phoeniceus*) may use the cattails for nesting and foraging. Mourning doves may use the adjacent areas for nesting.

3.4 Wildlife Movement Corridors

Wildlife movement includes migration (i.e., usually one way per season), inter-population movement (i.e., long-term genetic flow) and small travel pathways (i.e., daily movement corridors within an animal's territory). While small travel pathways usually facilitate movement for daily home range activities such as foraging or escape from predators, they also provide connection between outlying populations and the main corridor, permitting an increase in gene flow among populations.

These linkages among habitat types can extend for miles between primary habitat areas and occur on a large scale throughout California. Habitat linkages facilitate movement among populations located in discrete areas and populations located within larger habitat areas. The mosaic of habitats found within a large-scale landscape results in wildlife populations that consist of discrete sub-populations comprising a large single population, which is often referred to as a meta-population. Even where patches of pristine habitat are fragmented, such as occurs with coastal scrub, the movement between wildlife populations is facilitated through habitat linkages, migration corridors and movement corridors. Depending on the condition of the corridor, genetic flow between populations may be high in frequency, thus allowing high genetic diversity within the population, or may be low in frequency. Potentially low frequency genetic flow may lead to complete isolation, and if pressures are strong, potential extinction (McCullough 1996; Whittaker 1998).

The undeveloped nature of the Davidon Subdivision study area provides a limited movement corridor for common mammal species, such as coyote, within the local vicinity of the study area in eastern portion of East Antioch. Wildlife movement is limited in this area due to the increasing development, such as the residential development occurring on the western and southern borders of the study area, the residential development approved and planned immediately north of the study area, the commercial development along Lone Tree Way, and opening of the State Route 4 Bypass freeway along the entire easterly project boundary. The Antioch Creek may provide a suitable movement corridor for small to moderate sized animals; however, Antioch Creek does not connect to any other open space lands, and is separated from the project site by the new 6-lane freeway.

4.0 SPECIAL-STATUS SPECIES AND NATURAL COMMUNITIES

Certain plants and wildlife species are designated as having special status due to their overall rarity, endangerment, restricted distribution, and/or unique habitat requirements. In general, special-status is a combination of these factors that leads to the designation of a species as sensitive. The Federal Endangered Species Act (FESA), enacted by Congress in 1973, outlines the procedures whereby species are listed as endangered or threatened and established a program for the conservation of such species and the habitats in which they occur. Many individual states have enacted their own listing procedures to provide for the protection of additional locally sensitive biological resources. The California Endangered Species Act (CESA) of 1984 amends the California Fish and Game Code to protect species deemed to be locally endangered and essentially expands the number of species protected under the FESA.

The CDFG has also compiled a list of "Special Plants" (CDFG 2007a) and "Special Animals" (CDFG 2007b) which include California Special Concern species. These designations are given to plant species whose communities are seriously threatened, and to wildlife species whose breeding populations are in serious decline. Although these species may be abundant elsewhere they are considered to be at some risk of extinction in California. Although Special Concern species are afforded no official legal status under FESA or CESA, they may receive special consideration during the planning stages of certain development projects and adverse impacts may be deemed significant under the California Environmental Quality Act (CEQA).

4.1 Special-Status Vegetation Communities

Based on a review of the CNDDB(CNDDB 2007), a total of 6 special-status communities may have potential to occur within the region, including alkali meadow, alkali seep, cis-montane alkali marsh, coastal brackish marsh, coastal and valley freshwater marsh, and stabilized interior dunes. Only one of these communities occurs on the site, the coast and valley freshwater marsh.

4.2 Special-Status Plant Species

Special-status plant species include those listed as Endangered, Threatened, Rare or Candidates for listing by the USFWS (2007), the CDFG (2007a), the CNDDB (2007) and the CNPS (Skinner and Pavlik 1999). The CNPS listing is sanctioned by the CDFG and serves essentially as their list of "candidate" plant species.

Based on a review of the CNDDB (CNDDB 2007), and general and personal knowledge of the flora of eastern Contra Costa County, a total of 37 special-status plant species were reviewed, but only 14 were determined to have at least some potential for occurring in the study area based on the vegetation communities present (Appendix A). None of these target species were detected during the reconnaissance survey and none are considered to occur within the study area due to the highly disturbed nature of the site.

As discussed in the Draft EIR for *Future Urbanization Area #2 Specific Plan* (Mundie & Associates 1995) and the *Lindsey Basin Biological Constraints Analysis* (ESA 1994), five special-status plant species are identified as having some potential to occur within the study area. These include diamond-petaled California poppy (*Eschscholzia rhombipetala*), showy madia (*Madia radiata*), fragrant fritillary (*Fritillaria liliacea*), stinkbells (*Fritillaria agrestis*), and caper-fruited tropidocarpum (*Tropidocarpum capparideum*). In addition, 10 other species were evaluated for their potential to occur within the study area based on the habitat present. See Appendix A. None of these species are considered to have any potential to be present within the study area due to a lack of suitable habitat and the high level of disturbance.

The CNDDB records for the Antioch North, Antioch South, Brentwood, and Jersey Island quadrangles include several special-status plant species that are known to only occur within marsh habitat, including Delta tule pea (*Lathyrus jepsonii* var. *jepsonii*), Mason's lilaeopsis (*Lilaeopsis masonii*), soft bird's beak *(Cordylanthus mollis ssp. mollis*), and Suisun marsh aster (*Aster lentus*). However, these species are restricted to waterways of the Sacramento-San Joaquin Delta system, and none are considered to have any potential to occur within the study area. The isolated remnant freshwater marsh on site does not provide suitable habitat for these species. Two other special-status plant species, Antioch dunes evening primrose (*Oenothera deltoides* ssp. *howellii)* and Contra Costa wallflower (*Erysimum capitatum* ssp. *angustatum)* are also known from the sand dunes in the vicinity of Antioch. Neither of these species is considered to have any potential to occur within the study area due to lack of suitable habitat.

Below are descriptions of those species that are prominent in today's regulatory environment based on the location of the study area and the habitats present on the site.

Big tarplant (*Blepharizonia plumosa ssp. plumosae*) - a CNPS List B annual herb that occurs in valley/foothill grasslands on dry sites. This species may be extant in Alameda and possibly Contra Costa counties. This species blooms from July through October and was not observed on the site during the surveys conducted in 1995 and 2003 (Mundie and Associates 1995, Michael Brandman Associates 2003).

Diablo helianthella (*Helianthella castanea*) - a federal species of concern and a CNPS List 1B perennial herb that occurs in broadleaf upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, and Valley/foothill grassland. This species blooms April through June and was not observed during the surveys conducted in 1995 and 2003 (Mundie and Associates 1995, Michael Brandman Associates 2003).

Carquinez goldenbush (*Isocoma arguta*) - is a CNPS List 1B species that occurs in valley/foothill grasslands on alkaline soils. This species blooms August through December and was not observed during the surveys conducted in 1995 and 2003 (Mundie and Associates 1995, Michael Brandman Associates 2003).

Hoover's cryptantha (*Cryptantha hooveri*) - a CNPS List 1B species that occurs in valley/foothill grasslands. This species blooms April through May and was not observed during the surveys conducted in 1995 and 2003 (Mundie and Associates 1995, Michael Brandman Associates 2003).

Diamond-petaled California poppy (*Eschscholzia rhombipetala*) - a federal specie of concern and a CNPS List 1A annual herb that occurs in valley/foothill grassland on clay soils. This species blooms March through April and was not observed during the surveys conducted in 1995 and 2003 (Mundie and Associates 1995, Michael Brandman Associates 2003).

4.3 Special-Status Wildlife Species

Special-status animal species include those protected under FESA, CESA and Section 15380(d) of the California Environmental Quality Act (CEQA). The USFWS officially lists species as either Threatened (FT), Endangered (FE), or as candidates (FC) for listing. Additional species receive federal protection under the Bald Eagle Protection Act (e.g., bald eagle, golden eagle), and the Migratory Bird Treaty Act (MBTA). In addition, many other species are considered by the CDFG to be Special Concern species (CSC); these are listed in Remsen (1978), Williams (1986), and Jennings and Hayes (1994). Although such species are afforded no official legal status, they may receive special consideration during the planning stages of certain development projects. The CDFG further classifies some species under the following categories: "fully protected", "protected fur-bearer", "protected amphibian", and "protected reptile". The designation "protected" indicates that a species may not be taken or possessed except under special permit from the CDFG; "fully protected" indicates that a species can be taken for scientific purposes by permit only.

A total of 45 special-status animal species have potential to be present within the study area (CDFG 2007). A complete list of wildlife species, including their potential to occur within the study area, their legal status and habitat affinities, is included in Appendix B. Several special-status animal species have potential to occur within the Davidon Subdivision study area, including white-tailed kite (*Elanus leucurus*), American kestrel (*Falco sparverius*), loggerhead shrike (*Lanius ludovicianus*), and other passerine species. One species, the western burrowing owl (*Athene cunicularia hypugea*), is known to occur within the study area. Two species of concern, the loggerhead shrike and white-tailed kite, were observed nesting on the V. Jacuzzi property in 2005 (CNDDB 2007).

The following is a discussion of species that have either a low or moderate potential to occur within the study area, and/or are species that are prominent in today's regulatory environment. Special-status wildlife species associated with habitats not present within the study area, such as salt marsh habitat, vernal pools, interior dunes, and freshwater marshes, are not discussed in this report. These species include vernal pool fairy shrimp (*Branchinecta lynchi*), mid-valley fairy shrimp (*Branchinecta mesovalliensis*), San Joaquin dune beetle (*Coelus gracilis*), Antioch efferian robberfly (*Efferia antiochi*), red-headed sphecid wasp (*Eucceceris ruficeps*), curved-foot hygrotis beetle (*Hygrotus curvipes*), vernal pool tadpole shrimp (*Lepidurus packardi*), California linderiellla (*Linderiella occidentalis*), molestan blister beetle (*Lytta molesta*), Sacramento perch (*Archoplites interruptus*), delta smelt (*Hypomesus transpacificus*), western pond turtle (*Emys marmorata*), giant garter snake (*Thamnophis gigas*), saltmarsh common yellow-throat (*Geothlypis trichas sinuosa*), California black rail (*Laterallus jamaicensis coturniculus*), Suisun song sparrow (*Melospiza melodia maxillaris*), double-crested cormorant (*Phalacrocorax auritus*), and bank swallow (*Riparia riparia*).

4.2.1 Federal and State Threatened and Endangered Wildlife Species

San Joaquin kit fox (*Vulpes macrotis mutica*, SJKF), a federally listed Endangered and State listed Threatened species, are associated with open habitats, such as arid grasslands, alkali sinks, and open woodlands of the San Joaquin Valley and in surrounding foothills. Reports have shown that SJKF will use the edges of orchards for denning, while foraging in adjacent grassland areas. Kit fox are usually associated with loose textured soils that are suitable for excavating dens, with badgers and coyotes sometimes initiating the excavation. Dens have been found on flatter slopes, suggesting a preference for deep, friable soils. Den entrances are typically 5 to 10 inches in diameter, with three- to six-foot ramps formed from diggings, although dens in this species' northern range often lack ramps or other signs of use (Orloff, *et al*. 1986). Occurrences of populations of SJKF are thought to be related to the availability of denning sites, particularly natal denning sites, which are often moved several times throughout the season. Manmade features, such as culverts and roadbeds, are occasionally used for dens. San Joaquin kit fox prey includes kangaroo rats, black-tailed hare, and ground squirrels.

Study Area Occurrence. Ground squirrel burrows (approximately four inches in diameter extending 2.5 feet) were observed within the study area, which could provide potentially suitable denning habitat for San Joaquin kit fox. However, no occupied denning habitat occurs on the site. No scat, tracks or other sign were observed on site. The closest reported sightings of San Joaquin kit fox are located approximately nine miles to the west, at Black Diamond Mines (Bell 1992). Surveys conducted by H.T. Harvey in 1994 (Kaiser Site), by McGinnis in 1990 and 1991 (Lone Tree Valley) in areas east of the Black Diamond Mines produced negative results (H.T. Harvey and Associates 1997). However, construction and operation of Segment 1 of the Highway 4 Bypass freeway and residential and commercial buildings areas along Lone Tree Way precludes the presence of this species in this area. Therefore, no suitable habitat occurs within the study area for San Joaquin kit fox.

Swainson’s hawk (*Buteo swainsonii*, SH), State listed Threatened and protected under the Migratory Bird Treaty Act and California Fish and Game Code 3503.5, once found throughout the lowland basin of California, but are now restricted to portions of the Central Valley where suitable nesting and foraging habitat are still available. Swainson's hawks prefer to nest along the periphery of riparian systems, but will also use lone trees or groves of trees in agricultural fields (CDFG 1990). Valley oak (*Quercus lobata*), Fremont cottonwood (*Populus fremontii*), walnut (*Juglans hindsii*) and large willow (*Salix* sp.) are the tree species most commonly used. Swainson's hawks require large open grasslands with abundant prey, such as small mammals and insects. Over 85 % of SH territories in the Central Valley are in riparian systems adjacent to suitable foraging habitats (Barnes 1994).

Study Area Occurrence. This species has been reported nesting within two miles southeast of the Davidon Subdivision study area (CNDDB 2007). However, no suitable nesting trees occur in the study area.

The **California red-legged frog** (*Rana draytonii*, CRF) is listed by the USFWS as Threatened and is classified by the CDFG as a California Species of Special Concern. It breeds primarily in ponds, but will also breed in slow moving streams, or deep pools in intermittent streams. Inhabited ponds are typically permanent, at least three feet in depth, and contain emergent and shoreline vegetation. Sufficient pond depth and shoreline cover are both critical, because they provide means of escape from predators for the frogs. Non-breeding CRF have been found in both aquatic and upland habitats. The majority of individuals prefer dense, shrubby or emergent vegetation, closely associated with deep (>0.7 meters) still, or slow moving water. However, some individuals use habitats that are removed from aquatic habitats, seeking cover under coyote brush (*Baccharis pilularis*) and non-native grasslands (Fellers and Kleeman 2007, Tatarian 2005). Aestivation habitat can occur in areas up to 300 feet from a stream corridor or pond and includes natural features, such as boulders, rocks, trees, shrubs, and logs.

Study Area Occurrence: California red-legged frog is considered to have no potential to occur within the study area, based on the lack of suitable habitat on the site or within one mile of the site. No movement or dispersal corridors or hydrologic connection occurs between the project site and known locations of CRF.

The **California tiger salamander** (*Ambystoma californiense,* CTS) is federally listed Threatened, and a California Special Concern species. California tiger salamander inhabits grassland and oak savanna habitats in the valleys and low hills of central and coastal California. Habitat conversion has eliminated the species from much of its former range (Shaffer, *et al*. 1993; Fisher and Shaffer 1996). Adults spend most of their lives underground, typically in the burrows of ground squirrels and other animals (Stebbins and Cohen 1997, Jennings 1996). During winter rains between November and March, adults emerge from underground retreats to feed, court and breed (Loredo and Van Vuren 1996). Ponds must contain water for at least 3.5 months to allow CTS larvae to complete their development. Following transformation, juvenile salamanders seek refugia, typically mammal burrows, where they remain until the next winter rains (Stebbins 1985; Jennings 1996).

Study Area Occurrence: The California tiger salamander is considered to have no potential for occurrence within the study area due to the lack of suitable breeding habitat on the site, together with the site’s disconnection from known occurrences. The closest report sighting of CTS occurs approximately four miles southwest of the study area (CNDDB 2007). Residential and commercial development occurs between the study area and the reported sighting.

Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*, VELB), a federally-listed Threatened species, is a red and black wood-boring insect, occurs throughout the California Central Valley and foothills of the Coast Ranges and Sierras, between the elevations of 0 to 3,000 ft. The host plant, blue elderberry (*Sambucus mexicanus*), is typically associated with riparian habitats and adjacent upland habitats. The one- to two-year life cycle of the VELB is dominated by the larval stage of the insect, where it resides in the trunk and limbs of the blue elderberry. Emergence of adults occurs from late March through June, and evidence of occupancy in an elderberry is shown by the emergence hole of the adult. Today less than 4% of the historical 400,000 acres of riparian forest remain (USFWS 1990).

Study Area Occurrence: The VELB is considered to have no potential for occurrence within the study area due to the lack of suitable habitat on the site - no elderberry trees were observed on site.

4.2.2 Other Special-Status Wildlife Species

Bat Species (including pallid bat (*Antrozous pallidus*), small-footed myotis (*Myotis ciliolabrum*), long-eared myotis (*Myotis evotis*), fringed myotis (*Myotis thysanodes*), Yuma myotis (*Myotis yumanensis*), and long-legged myotis (*Myotis volans*)), are listed as federal Species of Concern and California Special Concern species. Of the 25 bat species in California, approximately 60% (15 species) use trees as an important part of their roosting habitat (Brown 1996). Species that use trees as well as other structures include pallid bat (*Antrozous pallidus*), western small-footed (*Myotis ciliolabrum*), western long-eared myotis (*Myotis evotis*), fringed bat (*Myotis thysanodes*), and long-legged bat (*Myotis volans*). Day roost selection is governed by several factors, such as temperature, roost configuration, lack of disturbance from people and predators, and proximity to foraging habitat and/or water (Brown 1996). Trees typically used by bats require structurally complex forests, heterogeneous age structure, large component of old trees (>25 inch DBH) and >40 feet in height), with emergent canopy or gap providing sun exposure and snags of various stages, although smaller trees with suitable cavities are also used.

Study Area Occurrence. No suitable roosting habitat occurs on the site for special status bat species.

The **western burrowing Owl** (BUOW) is a federal and California Special Concern species and is protected under the Migratory Bird Treaty Act. The BUOW is small, and long-legged, with dull brown plumage that is barred and spotted with white. Burrowing owls are typically observed on the ground, at or near a burrow, or on elevated areas, such as dirt mounds or fence posts that are used as observational or hunting perches. Three habitat characteristics that comprise burrowing owl habitat include openness (lack of canopy cover), short vegetation, and burrow availability. Suitable habitat may also include areas with trees and shrubs, as long as the canopy covers less than 30 percent of the ground surface (CDFG 1995, CBOC 1993). Vegetation height has been identified as a limiting factor in occupancy (Coulombe 1971, Wesseman 1985). Owls have been reported foraging up to one mile from breeding areas (Haug and Oliphant 1990). Long distance movement of BUOW of over 53 km has been reported for birds in Carrizo Plain, near Bakersfield (Rosier, et al 2006). Although similar movements have been reported for birds in Canada, movement was attributed to habitat fragmentation, not experienced on the Carrizo plain (Rosier, et al 2006).

Study Area Occurrence. This species has been observed in the southwestern corner of the study area since 2005 (CNDDB 2007). Please refer to Table 1 for a synopsis of the number of owls observed on the site.

Table: Number of BUOW observed in the southwestern portion of Park Ridge Estates

Date (Reference)	Number of BUOW	Banded	Exclusion Date
8/5/05 (1)	8	no	none
9/1 – 9/7/05 (2)	9	7	none
9/23 – 9/28/05 (3)	4	4	9/23 – 9/28/05
2/6/06 – 3/10/06 (4)	3	1	2/6 – 3/10/06
3/19/06 (5)	2	no	none
2/27/07 (5)	1	no	2/13/ - 3/15/07
9/20/07 (5)	1	no	none

Notes:

1 = Wildlife Research Associates 2005.

2 = Albion Environmental 2005a.

3 = Albion Environmental 2005b.

4 = Wildlife Research Associates 2006.

5 = Wildlife Research Associates 2007a.

In August 2005, 3 adults and 5 babies, with down on their heads, were observed on the site during focused surveys in the southwestern portion of the site (Wildlife Research Associates 2005). Focused surveys for BUOW were conducted only in this area and not of the entire site. In a follow-up survey in September, a total of 9 BUOW were observed in the southwestern portion (Albion 2005a). Of these 9, two adults were banded, and 5 of the 7 juveniles were banded (Albion 2005a) at the request of CDFG.

On February 6, 2006, three BUOW, of which one was banded, were observed in the southwestern portion of the site (Wildlife Research Associates 2006). Under coordination with CDFG, these owls were excluded and the burrows were collapsed. No additional surveys for BUOW on the rest of the site were conducted. No collapse of burrows were conducted in the northwestern portion of the site. In February of 2007, one BUOW was observed in the southwest area and was excluded. In September 2007, another owl was observed in a new set of burrows in the southwestern central portion of the site. This owl was not excluded, nor were the burrows collapsed.

In 2006, three pairs of BUOW were observed in the northwestern portion of the site. In 2007, 4 pairs were observed (CNDDB 2007). None of the BUOW appeared to be banded.

Previous Mitigation: As part of the exclusion and banding procedure conducted in 2005 on the Davidon project site, mitigation for the 1 pair and 1 unpaired resident owl was implemented in August of 2006. A Purchase Agreement was completed for 19.5 credits (acres of occupied habitat credit) purchased by Davidon for the Jacuzzi Ranch (Park Ridge) Project in Antioch in the

CDFG-approved Haera Conservation Bank, operated by Wildlands, Inc. Copies of the executed Agreement were provided by the project sponsor to the City of Antioch and CDFG. The 19.5 conservation bank credits correspond to the adopted CDFG policy (based on the Burrowing Owl Survey Protocol and Mitigation Guidelines report prepared in April of 1993 by the California Burrowing Owl Consortium) of requiring 1.5 times 6.5 acres (9.75 acres) of replacement occupied habitat for each pair or single adult bird affected (1.5 X 6.5 acres X 2 pair or single individuals = requirement for 19.5 acres of occupied replacement habitat).

Although 7 of the 9 BUOW were banded, which allowed for tracking of those individuals, only one owl was observed in February 2006 in the southwestern corner. After exclusion in 2006, subsequent sightings of them have not been reported on the Park Ridge project site or in the vicinity (Barclay, pers. comm. 2007). None of the BUOW observed on the Park Ridge Estate site after February 2006 appeared to be banded. As a result, it is unclear where those originally banded on the project site have moved to, and whether the birds subsequently observed on the project site have migrated from the Bypass right-of-way or another site for which mitigation have been provided. Additionally, due to their mobility and use of many different burrows within a complex, the number of birds currently using the southwestern and northwestern corners of the site is unknown.

Raptors (birds of prey) (including white-tailed kite (*Elanus leucurus*), American kestrel (*Falco americanus*), northern harrier (*Circus cyaneus*) and red-tailed hawk (*Buteo jamaicensis*)) are Protected under the Federal Migratory Bird treaty Act and Fish and Game Code 3503.5 and 3511. Nest structures for raptor species range from stick nests to ground nesting. Remnant orchard trees located individually throughout the study area once provided potential nesting habitat for a limited number of the raptor species listed above.

Study Area Occurrence. White tailed kite and kestrels were observed nesting on the Deliza Ranch property in 2005 (CNDDB 2007). There is a high likelihood that these birds may nest within the same area in the future. The remaining grasslands on the site provide nesting habitat for northern harrier.

Passerines (perching birds) (including loggerhead shrike (*Lanius ludovicianus*), Say's phoebe (*Sayornis saya*), mourning dove (*Zenaida macroura*) and ground-nesting species, such as western meadowlark, (*Sturnella neglecta*), and horned lark (*Eremophila alpestris actia*), are protected under the Federal Migratory Bird Treaty Act and Fish and Game Code 3503.5. Several of these species, including western meadowlark and horned lark, breed in open grasslands throughout the Central Valley and adjacent foothills and along the central and southern California coast region. These species typically prefer shorter, less dense grasses and areas with some bare ground. California horned lark often forms flocks in the summer and winter months, foraging and roosting in cultivated fields and along dirt roads and feeding on insects and seeds. Tree nesting species, such as loggerhead shrike and mourning dove, prefer densely vegetated, isolated trees and shrubs and occasionally man-made structures are typically used for nesting. Loggerhead shrikes feed on a variety of small prey, including arthropods, small mammals, amphibians, reptiles and birds (Yosef 1996). Since it lacks talons, it often impales prey on thorns or barbed wire. In California, the species does not migrate and is resident year-round. Pairs maintain territories during the breeding season and individuals maintain territories during the winter (Yosef 1996).

Study Area Occurrence. These passerines may nest throughout the study area in grasslands and in individual trees. Loggerhead shrikes once nested within almond trees, which are annually trimmed. Unless tree structures are removed completely, , there is a high likelihood this species will nest on the site. The willow trees located at the freshwater marsh may also provide nesting habitat for passerines.

5.0 IMPACTS AND MITIGATION MEASURES

This section summarizes the potential temporary biological impacts from construction activities within the study area. The analysis of these impacts is based on a single reconnaissance-level survey of the study area, focused BUOW surveys at the southwest corner of the project site, a review of existing databases and literature, and personal professional experience with biological resources of the region. Potential impacts to special-status biotic resources, namely to individual special-status animal species may occur from the proposed project. Mitigation for these biological impacts to avoid adverse effects on the environment, are provided below.

Assessing impacts and creating mitigation measures for western burrowing owl were based on the CDFG *Staff Report on Burrowing Mitigation* (CDFG 1995) which is based on the *Burrowing Owl Survey Protocol and Mitigation Guidelines* created by the California Burrowing Owl Consortium (CBOC 1993).

Impact 5.1. The **San Joaquin kit fox** has no potential for occurrence on-site, and based on the presumed presence of extremely low numbers in the region and the physical distance and urban separation of the site from known San Joaquin kit fox habitat, no suitable habitat for this species occurs on the study site. Although ground squirrel burrows, which could provide potentially suitable denning habitat, were observed on site, no burrows showed signs of San Joaquin kit fox activity (i.e., large dirt ramps from excavation, cleared vegetation, tracks, scat, etc). Therefore, construction within the grasslands would not result in any temporary direct or indirect impacts to San Joaquin kit fox individuals and/or habitat.

This is a less-than-significant impact. No mitigation measures are required.

Impact 5.2. The proposed project could result in disturbance of potential **raptor nesting** habitat on the adjacent Deliza Ranch lands and within the study area. Disturbance during the nesting season (February 1 through August 31) may result in the potential nest abandonment and mortality of young.

Mitigation Measure 5.2: To avoid "take" and/or further evaluate presence or absence of raptors, the following measures are recommended:

A. A pre-construction nesting bird survey of the individual trees and grasslands throughout the study area shall be performed by a qualified biologist. If no nesting birds are observed no further action is required and grading may occur within one week of the survey to prevent "take" of individual birds that may have begun nesting after the survey.

B. If birds are observed nesting on site after February 1 it should be assumed that they are nesting adjacent to the site. The CDFG Central Coast Regional office allows grading to occur if nesting birds are observed on site, providing that a 300-foot buffer zone is created around the observed nest to prevent disturbance and ultimately "take" of young.

Impact 5.3. The proposed project was found in 2005 to result in the removal of occupied **BUOW nesting** habitat within the non-native grasslands in the southwestern corner of the site. The habitat area was found to have been occupied in 2005 by one pair and one individual adult owl, along with dependent juvenile owls. Mitigation for this impact was implemented in 2006 through the purchase of credits in a CDFG-authorized mitigation bank correlating with 19.5 acres of occupied replacement habitat. Subsequent follow-up surveys conducted in 2006 and 2007 have identified burrow complexes in northwestern and southwestern areas of the site which appear to support a current population of owls. Disturbance to these areas during the nesting season (February 1 through August 31) may result in the potential nest abandonment and mortality of young, resulting in "take" of individuals.

Mitigation 5.3. Established procedures provide for mitigation of lost nesting BUOW habitat either on-site of off-site. Mitigation Measure No. 2 of the CDFG *Staff Report on Burrowing Owl Mitigation* (CDFG 1995) states the following:

> "To offset the loss of foraging and burrow habitat on the project site, a minimum of 6.5 acres of foraging habitat, (calculated on a 100-m (approx. 300 ft.) foraging radius around the burrow) per pair or unpaired resident bird, should be acquired and permanently protected. The protected lands should be adjacent to occupied burrowing owl habitat and at a location acceptable to the Department. *Protection of additional habitat acreage per pair or unpaired resident bird may be applicable in some instances.* The California Burrowing Owl Consortium has also developed mitigation guidelines (CBOC 1993) that can be incorporated by CEQA lead agencies and which are consistent with this staff report."

The California Burrowing Owl Consortium *Burrowing Owl Survey Protocol and Mitigation Guidelines* (CBOC 1993) state the following:

> "Off-site habitat must be suitable burrowing owl habitat, as defined in the *Burrowing Owl Survey Protocol,* and the site approved by CDFG. Land should be purchased and/or placed in a conservation easement in perpetuity and managed to maintain suitable habitat. Off-site mitigation should use one of the following ratios:
> 1. Replacement of occupied habitat with occupied habitat: 1.5 times 6.5 (9.75) acres per pair or single bird.
> 2. Replacement of occupied habitat with habitat contiguous to currently occupied habitat: 2 times 6.5 (13.0) acres per pair or single bird.
> 3. Replacement of occupied habitat with suitable unoccupied habitat: 3 times 6.5 (19.5) acres per pair or single bird."

Based on the foregoing, the project sponsor entered into discussions with the City of Antioch (Lead Agency under CEQA) and CDFG in 2005-2006 to consider the feasibility of using a minimum of 13 acres (6.5 acres X 2 pair or unpaired individual owls) of the on-site open space area as a protected mitigation site. Following review and comment from the City and CDFG staff, it was determined that a number of long-term operational constraints made the on-site mitigation option less desirable than an off-site option. As a result, 19.5 credits for occupied habitat within a CDFG-authorized mitigation bank at an off-site location were purchased (1.5 X 6.5 acres X 2 pair or unpaired individual owls) and reported as mitigation for loss of occupied nesting habitat identified in 2005-2006 in the southwestern corner. No exclusion or eradication effort was conducted of the potential habitat (ground squirrel burrows) subsequently identified in the NW corner of the entire site. As a result, these areas currently remain available for use by BUOW.

Impact 5.4. The proposed project could result in **"take" of individuals or pairs of BUOW nesting** within the Park Ridge Estates project site.

Mitigation 5.4. To avoid "take" of individual BUOW nesting on site, the following measures are recommended:

A. If ground disturbance must occur within the nesting season (February 1 to August 31), a pre-construction nesting burrowing owl survey following CDFG protocols should be performed by a qualified biologist prior to disturbance. Protocol surveys include conducting four crepuscular (early morning or late evening) surveys. If owls are found but no courtship behavior is observed then exclusion of the owls from the burrows may occur. Any early season active nests, as shown by courtship behavior or food transfers between adults, must not be disturbed until the young have fledged.

B. Ground squirrel burrows within the area of proposed ground disturbance will have exclusion devises put on them for 48 hours to ensure any owls have left the burrows before excavation.

C. All burrows with active nests with owls exhibiting courtship behavior or food transference shall be identified by flagging and be protected by a no disturbance buffer zone of 75 meters (approximately 250 feet). No further disturbance to these areas shall occur until the young have fledged and exclusion has been implemented.

D. Areas of bare ground or with grass less than six inches in height may attract burrowing owls during the winter season. If construction is to occur after a period of inactivity and soil is left barren, a burrowing owl habitat evaluation to determine occupancy of the site should be conducted prior to ground disturbance the following season.

Impact 5. 5. The proposed project could result in the removal of potential **passerine nesting** habitat in the non-native grasslands and trees along the southern and northern boundaries, although no focused surveys for nesting passerines have been conducted within the study area. Disturbance during the nesting season may result in the potential nest abandonment and mortality of young.

Mitigation Measure 5.5: The BUOW Conservation Area will provide nesting passerine habitat. To avoid "take" and/or further evaluate presence or absence of passerines, the following measures are recommended:

- Grading within the grasslands should be conducted outside the nesting season, which occurs between approximately February 1 and August 15.
- If grading before February 1 is infeasible and groundbreaking must occur within the breeding season, a pre-construction nesting bird survey of the grasslands and adjacent trees shall be performed by a qualified biologist. If no nesting birds are observed no further action is required and grading shall occur within one week of the survey to prevent "take" of individual birds that may have begun nesting after the survey.
- If birds are observed on site after February 1 it will be assumed that they are nesting on site or adjacent to the site and ground breaking will have to be delayed until after the young have fledged, as determined by bird surveys by a qualified biologist, or after the nesting season.
- The CDFG Central Coast Regional office does allow grading to occur if nesting birds are observed on site, providing that a 100 foot buffer zone is created around the

observed nest. Because nests may occur in the middle of the grading area, this method is not advised.

- Nesting bird surveys for raptors and passerines may occur at the same time, after February 1.

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Appendix C

Burrowing Owl Banding Report

ALBION ENVIRONMENTAL, INC.
NATURAL AND CULTURAL RESOURCES CONSULTANTS

1414 SOQUEL AVENUE, SUITE 205
SANTA CRUZ, CALIFORNIA 95062

TELEPHONE (831) 469-9128
FACSIMILE (831) 469-9137

September 12, 2005

Richard T. Loewke, AICP
Urban & Environmental Planning
55 Oak Trail Court
Alamo, CA 94507

Dear Mr. Loewke:

I am writing with a final report on burrowing owl (*Athene cunicularia*) banding at the Davidon site in Antioch. The Davidon site is located immediately east of Canada Valley Road approximately 0.4 miles north of Lone Tree Way in the City of Antioch, Contra Costa County. The site supports mixed herbaceous vegetation ranging up to 5 feet tall in places. Owls were using burrows on the east-facing slope of a small hill that extends east from Canada Valley Road just south of a short dead-end spur on the as-yet-to-be-constructed Jacuzzi Drive. I also observed owls roosting at burrows in a low ridge of rocky debris approximately 150 feet southeast of the small hill and at a small burrow complex on the opposite slope approximately 400 feet to the east.

I saw a total of 9 burrowing owls, 2 adults and 7 juveniles, when I briefly monitored their behavior and evaluated opportunities to capture them on August 29th and 30th . I did not observe the owls retreating down burrows, either voluntarily or when provoked, so there were no opportunities to capture them using one-way doors and enclosures. I also closely monitored the owls throughout the day on September 2 and did not see them retreat down burrows for extended periods. Based on their behavior I decided to capture them for banding using other raptor traps including a bow net, dho-gazza and bal-chatri.

We (myself or my employee Lindsay Harman) spent 4 evenings trapping - September 1, 2, 6 and 7, 2005. We captured and banded a total of 7 burrowing owls; 2 adults and 7 juveniles. Age was determined by molt and plumage condition. Below are the band numbers, ages and banding dates. Each captured owl was banded with a standard bird band issued by the U.S. Geological Survey Bird Banding Laboratory (i.e., federal band) and a red metal color band with alphanumeric code manufactured by Acraft Sign and Nameplate Company. The red color bands, which can be read with binoculars or spotting scope, enable individual identification without having the bird in the hand as is necessary to read the federal band number. Each owl was released immediately after it was banded and no owls were injured during trapping.

Federal Band No.	Color Band No. (type 1*)	Age	Date Banded
934-13876	Red VK	Juvenile	9/1/05
934-13877	Red WK	Juvenile	9/2/05
934-13878	Red XK	Adult	9/6/05
934-13879	Red YK	Juvenile	9/6/05
934-13880	Red AM	Juvenile	9/7/05
934-13881	Red BM	Juvenile	9/7/05
934-13882	Red CM	Adult	9/7/05

*Type 1 refers to the orientation of the characters on the color band, in this case side-by-side.

As required by my federal and state authorizations to capture and band burrowing owls I will be submitting these banding records to the Bird Banding Laboratory and to the Department of Fish and Game with my annual report of activities. I have also submitted a field observation form of my burrowing owl observations and bandings to the California Natural Diversity Database.

Thank you for asking me to band these burrowing owls. Please contact me if you have any questions about my report.

Sincerely,

Jack Barclay
Ornithologist, Vice-President
Master Banding Permit No. 23371
CDFG Burrowing Owl Research MOU June 9, 2000
CDFG Scientific Collecting Permit No. 004413

Appendix D

Burrowing Owl Survey Protocol & Mitigation Guidelines

BURROWING OWL SURVEY PROTOCOL AND MITIGATION GUIDELINES

Prepared by:

The California Burrowing Owl Consortium

April 1993

INTRODUCTION

The California Burrowing Owl Consortium developed the following Survey Protocol and Mitigation Guidelines to meet the need for uniform standards when surveying burrowing owl *(Speotyto cunicularia)* populations and evaluating impacts from development projects. The California Burrowing Owl Consortium is a group of biologists in the San Francisco Bay area who are interested in burrowing owl conservation. The following survey protocol and mitigation guidelines were prepared by the Consortium's Mitigation Committee. These procedures offer a decision-making process aimed at preserving burrowing owls in place with adequate habitat.

California's burrowing owl population is clearly in peril and if declines continue unchecked the species may qualify for listing. Because of the intense pressure for development of open, flat grasslands in California, resource managers frequently face conflicts between owls and development projects. Owls can be affected by disturbance and habitat loss, even though there may be no direct impacts to the birds themselves or their burrows. There is often inadequate information about the presence of owls on a project site until ground disturbance is imminent. When this occurs there is usually insufficient time to evaluate impacts to owls and their habitat. The absence of standardized field survey methods impairs adequate and consistent impact assessment during regulatory review processes, which in turn reduces the possibility of effective mitigation.

These guidelines are intended to provide a decision-making process that should be implemented wherever there is potential for an action or project to adversely affect burrowing owls or the resources that support them. The process begins with a four-step survey protocol to document the presence of burrowing owl habitat, and evaluate burrowing owl use of the project site and a surrounding buffer zone. When surveys confirm occupied habitat, the mitigation measures are followed to minimize impacts to burrowing owls, their burrows and foraging habitat on the site. These guidelines emphasize maintaining burrowing owls and their resources in place rather than minimizing impacts through displacement of owls to an alternate site.

Each project and situation is different and these procedures may not be applicable in some circumstances. Finally, these are not strict rules or requirements that must be applied in all situations. They are guidelines to consider when evaluating burrowing owls and their habitat, and they suggest options for burrowing owl conservation when land use decisions are made.

Section 1 describes the four phase Burrowing Owl Survey Protocol. Section 2 contains the Mitigation Guidelines. Section 3 contains a discussion of various laws and regulations that protect burrowing owls and a list of references cited in the text.

We have submitted these documents to the California Department of Fish and Game (CDFG) for review and comment. These are untested procedures and we ask for your comments on improving their usefulness.

SECTION 1 BURROWING OWL SURVEY PROTOCOL

PHASE I: HABITAT ASSESSMENT

The first step in the survey process is to assess the presence of burrowing owl habitat on the project site including a 150-meter (approx. 500 ft.) buffer zone around the project boundary (Thomsen 1971, Martin 1973).

Burrowing Owl Habitat Description
Burrowing owl habitat can be found in annual and perennial grasslands, deserts, and scrublands characterized by low-growing vegetation (Zarn 1974). Suitable owl habitat may also include trees and shrubs if the canopy covers less than 30 percent of the ground surface. Burrows are the essential component of burrowing owl habitat: both natural and artificial burrows provide protection, shelter, and nests for burrowing owls (Henny and Blus 1981). Burrowing owls typically use burrows made by fossorial mammals, such as ground squirrels or badgers, but also may use man-made structures, such as cement culverts; cement, asphalt, or wood debris piles; or openings beneath cement or asphalt pavement.

Occupied Burrowing Owl Habitat
Burrowing owls may use a site for breeding, wintering, foraging, and/or migration stopovers. Occupancy of suitable burrowing owl habitat can be verified at a site by an observation of at least one burrowing owl, or, alternatively, its molted feathers, cast pellets, prey remains, eggshell fragments, or excrement at or near a burrow entrance. Burrowing owls exhibit high site fidelity, reusing burrows year after year (Rich 1984, Feeney 1992). A site should be assumed occupied if at least one burrowing owl has been observed occupying a burrow there within the last three years (Rich 1984).

The Phase II burrow survey is required if burrowing owl habitat occurs on the site. If burrowing owl habitat is not present on the project site and buffer zone, the Phase II burrow survey is not necessary. A written report of the habitat assessment should be prepared (Phase IV), stating the reason(s) why the area is not burrowing owl habitat.

PHASE II: BURROW SURVEY

1. A survey for-burrows and owls should be conducted by walking through suitable habitat over the entire project site and in areas within 150 meters (approx 500 ft.) of the project impact zone. This 150-meter buffer zone is included to account for adjacent burrows and foraging habitat outside the project area and impacts from factors such as noise and vibration due to heavy equipment which could impact resources outside the project area.

2. Pedestrian survey transects should be spaced to allow 100 percent visual coverage of the ground surface. The distance between transect center lines should be no more than 30 meters (approx. 100 ft.), and should be reduced to account for differences in terrain, vegetation density, and ground surface visibility. To efficiently survey projects larger than 100 acres, it is recommended that two or more surveyors conduct concurrent surveys. Surveyors should maintain a minimum distance of 50 meters (approx. 160 ft.) from any owls or occupied burrows. It is important to minimize disturbance near occupied burrows during all seasons.

3. If burrows or burrowing owls are recorded on the site, a map should be prepared of the burrow concentration areas. A breeding season survey and census (Phase III) of burrowing owls is the next step required.

4. Prepare a report (Phase IV) of the burrow survey stating whether or not burrows are present.

5. A preconstruction survey may be required by project-specific mitigations no more than 30 days prior to ground disturbing activity.

PHASE III: BURROWING OWL SURVEYS, CENSUS AND MAPPING

If the project site contains burrows that could be used by burrowing owls, then survey efforts should be directed towards determining owl presence on the site. Surveys in the breeding season are required to describe if, when, and how the site is used by burrowing owls. If no owls are observed using the site during the breeding season, a winter survey is required.

Survey Methodology
A complete burrowing owl survey consists of four site visits. During the initial site visit examine burrows for owl sign and map the locations of occupied burrows. Subsequent observations should be conducted from as many fixed points as necessary to provide visual coverage of the site using spotting scopes or binoculars. It is important to minimize disturbance near occupied burrows during all seasons. Site visits must be repeated on four separate days. Conduct these visits from two hours before sunset to one hour after or from one hour before to two hours after sunrise. Surveys should be conducted during weather that is conducive to observing owls outside their burrows. Avoid surveys during heavy rain, high winds (> 20 mph), or dense fog.

Nesting Season Survey. The burrowing owl nesting season begins as early as February 1 and continues through August 31 (Thomsen 1971, Zam 1974). The timing of nesting activities may vary with latitude and climatic conditions. If possible, the nesting season survey should be conducted during the peak of the breeding season, between April 15 and July 15. Count and map all burrowing owl sightings, occupied burrows, and burrows with owl sign. Record numbers of pairs and juveniles, and behavior such as courtship and copulation. Map the approximate territory boundaries and foraging areas if known.

Survey for Winter Residents (non-breeding owls). Winter surveys should be conducted between December 1 and January 31, during the period when wintering owls are most likely to be present. Count and map all owl sightings, occupied burrows, and burrows with owl sign.

Surveys Outside the Winter and Nesting Seasons. Positive results, (i.e., owl sightings)- outside of the above survey periods would be adequate to determine presence of owls on site. However, results of these surveys may be inadequate for mitigation planning because the numbers of owls and their pattern of distribution may change during winter and nesting seasons. Negative results during surveys outside the above periods are not conclusive proof that owls do not use the site.

Preconstruction Survey. A preconstruction survey may be required by project-specific mitigations and should be conducted no more than 30 days prior to ground disturbing activity.

PHASE IV: RESOURCE SUMMARY, WRITTEN REPORT

A report should be prepared for CDFG that gives the results of each Phase of the survey protocol, as outlined below.

Phase I: Habitat Assessment

1. Date and time of visit(s) including weather and visibility conditions; methods of survey.

2. Site description including the following information: location, size, topography, vegetation communities, and animals observed during visit(s).

3. An assessment of habitat suitability for burrowing owls and explanation.

4. A map of the site.

Phase II: Burrow Survey

1. Date and time of visits including weather and visibility conditions; survey methods including transect spacing.

2. A more detailed site description should be made during this phase of the survey protocol including a partial plant list of primary vegetation, location of nearest freshwater (on or within one mile of site), animals observed during transects.

3. Results of survey transects including a map showing the location of concentrations of burrow(s) (natural or artificial) and owl(s), if present.

Phase III: Burrowing Owl Surveys, Census and Mapping

1. Date and time of visits including weather and visibility conditions; survey methods including transect spacing.

2. Report and map the location of all burrowing owls and owl sign. Burrows occupied by owl(s) should be mapped indicating the number of owls at each burrow. Tracks, feathers, pellets, or other items (prey remains, animal scat) at burrows should also be reported.

3. Behavior of owls during the surveys should be carefully recorded (from a distance) and reported. Describe and map areas used by owls during the surveys. Although not required, all behavior is valuable to document including feeding, resting, courtship, alarm, territorial, parental, or juvenile behavior.

4. Both winter and nesting season surveys should be summarized. If possible include information regarding productivity of pairs, seasonal pattern of use, and include a map of the colony showing territorial boundaries and home ranges.

5. The historical presence of burrowing owls on site should be documented, as well as the source of such information (local bird club, Audubon society, other biologists, etc.).

Burrowing: Owl Survey Protocol

April 1993

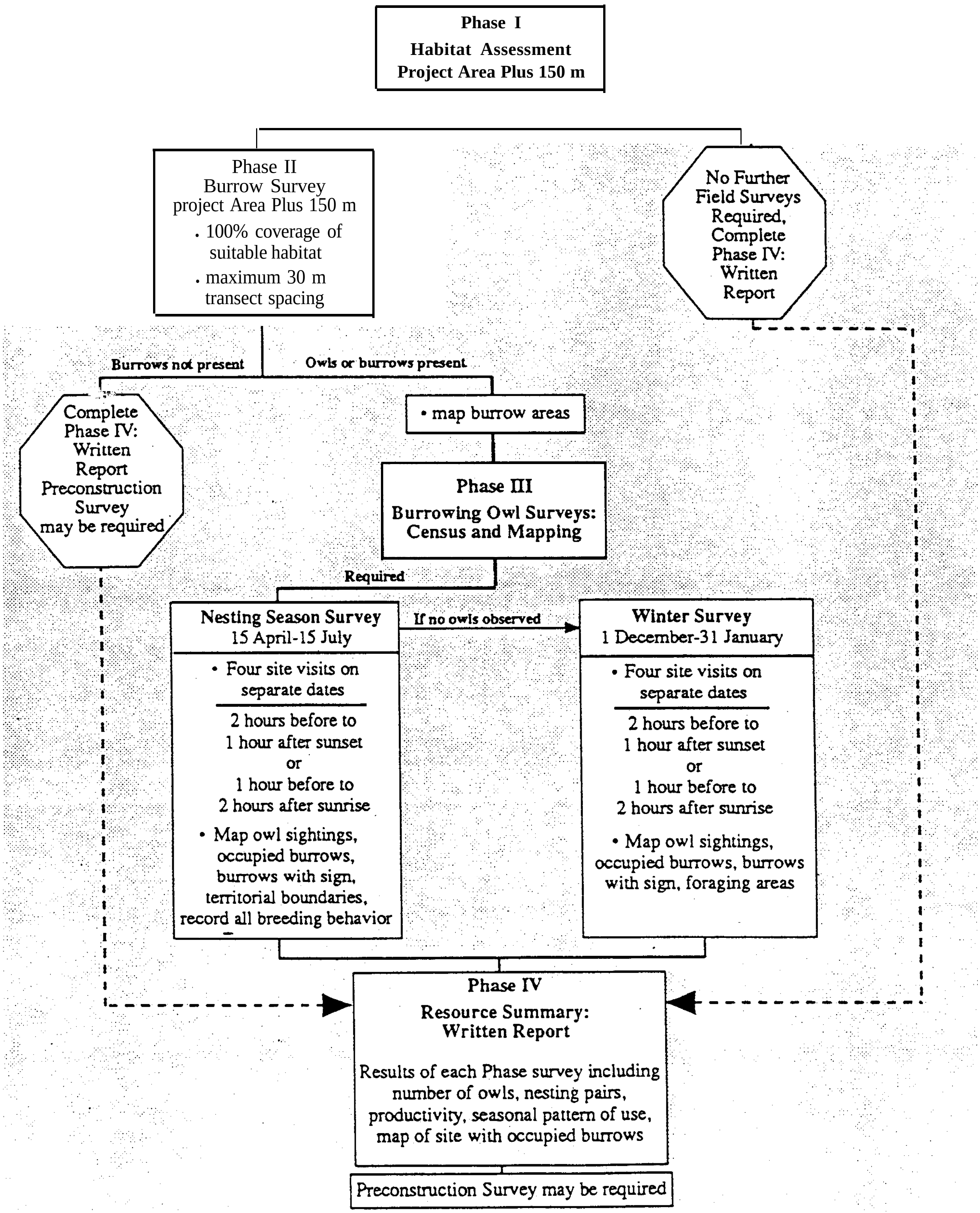

Figure 1.

SECTION 2 BURROWING OWL MITIGATION GUIDELINES

The objective of these mitigation guidelines is to minimize impacts to burrowing owls and the resources that support viable owl populations. These guidelines are intended to provide a decision-making process that should be implemented wherever there is potential for an action or project to adversely affect burrowing owls or their resources. The process begins with a four-step survey protocol (see *Burrowing Owl Survey Protocol)* to document the presence of burrowing owl habitat, and evaluate burrowing owl use of the project site and a surrounding buffer zone. When surveys confirm occupied habitat, the mitigation measures described below are followed to minimize impacts to burrowing owls, their burrows and foraging habitat on the site. These guidelines emphasize maintaining burrowing owls and their resources in place rather than minimizing impacts through displacement of owls to an alternate site.

Mitigation actions should be carried out prior to the burrowing owl breeding season, generally from February 1 through August 31 (Thomsen 1971, Zarn 1974). The timing of nesting activity may vary with latitude and climatic conditions. Project sites and buffer zones with suitable habitat should be resurveyed to ensure no burrowing owls have occupied them in the interim period between the initial surveys and ground disturbing activity. Repeat surveys should be conducted not more than 30 days prior to initial ground disturbing activity.

DEFINITION OF IMPACTS

1. Disturbance or harassment within 50 meters (approx. 160 ft.) of occupied burrows.

2. Destruction of burrows and burrow entrances. Burrows include structures such as culverts, concrete slabs and debris piles that provide shelter to burrowing owls.

3. Degradation of foraging habitat adjacent to occupied burrows.

GENERAL CONSIDERATIONS

1. Occupied burrows should not be disturbed during the nesting season, from February 1 through August 31, unless the Department of Fish and Game verifies that the birds have not begun egg-laying and incubation or that the juveniles from those burrows are foraging independently and capable of independent survival at an earlier date.

2. A minimum of 6.5 acres of foraging habitat, calculated on a 100-m (approx. 300 ft.) foraging radius around the natal burrow, should be maintained per pair (or unpaired resident single bird) contiguous with burrows occupied within the last three years (Rich 1984, Feeney 1992). Ideally, foraging habitat should be retained in a long-term conservation easement.

3. When destruction of occupied burrows is unavoidable, burrows should be enhanced (enlarged or cleared of debris) or created (by installing artificial burrows) in a ratio of 1:1 in adjacent suitable habitat that is contiguous with the foraging habitat of the affected owls.

4. If owls must be moved away from the disturbance area, passive relocation (see below) is preferable to trapping. A time period of at least one week is recommended to allow the owls to move and acclimate to alternate burrows.

5. The mitigation committee recommends monitoring the success of mitigation programs as required in Assembly Bill 3180. A monitoring plan should include mitigation success criteria and an annual report should be submitted to the California Department of Fish and Game.

AVOIDANCE

Avoid Occupied Burrows

No disturbance should occur within 50 m (approx. 160 ft.) of occupied burrows during the non-breeding Season of September 1 through January 31 or within 75 m (approx. 250 ft.) during the breeding Season of February 1 through August 31. Avoidance also requires that a minimum of 6.5 acres of foraging habitat be preserved contiguous with occupied burrow sites for each pair of breeding burrowing owls (with or without dependent young) or single unpaired resident bird (Figure 2).

MITIGATION FOR UNAVOIDABLE IMPACTS

On-site Mitigation

On-site passive relocation should be implemented if the above avoidance requirements cannot be met. Passive relocation is defined as encouraging owls to move from occupied burrows to alternate natural or artificial burrows that are beyond 50 m from the impact zone and that are within or contiguous to a minimum of 6.5 acres of foraging habitat for each pair of relocated owls (Figure 3). Relocation of owls should only be implemented during the non-breeding season. On-site habitat should be preserved in a conservation easement and managed to promote burrowing owl use of the site.

Owls should be excluded from burrows in the immediate impact zone and within a 50 m (approx. 160 ft.) buffer zone by installing one-way doors in burrow entrances: One-way doors should be left in place 48 hours to insure owls have left the burrow before excavation. One alternate natural or artificial burrow should be provided for each burrow that will be excavated in the project impact zone. The project area should be monitored daily for one week to confirm owl use of alternate burrows before excavating burrows in the immediate impact zone. Whenever possible, burrows should be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe or burlap bags should be inserted into the tunnels

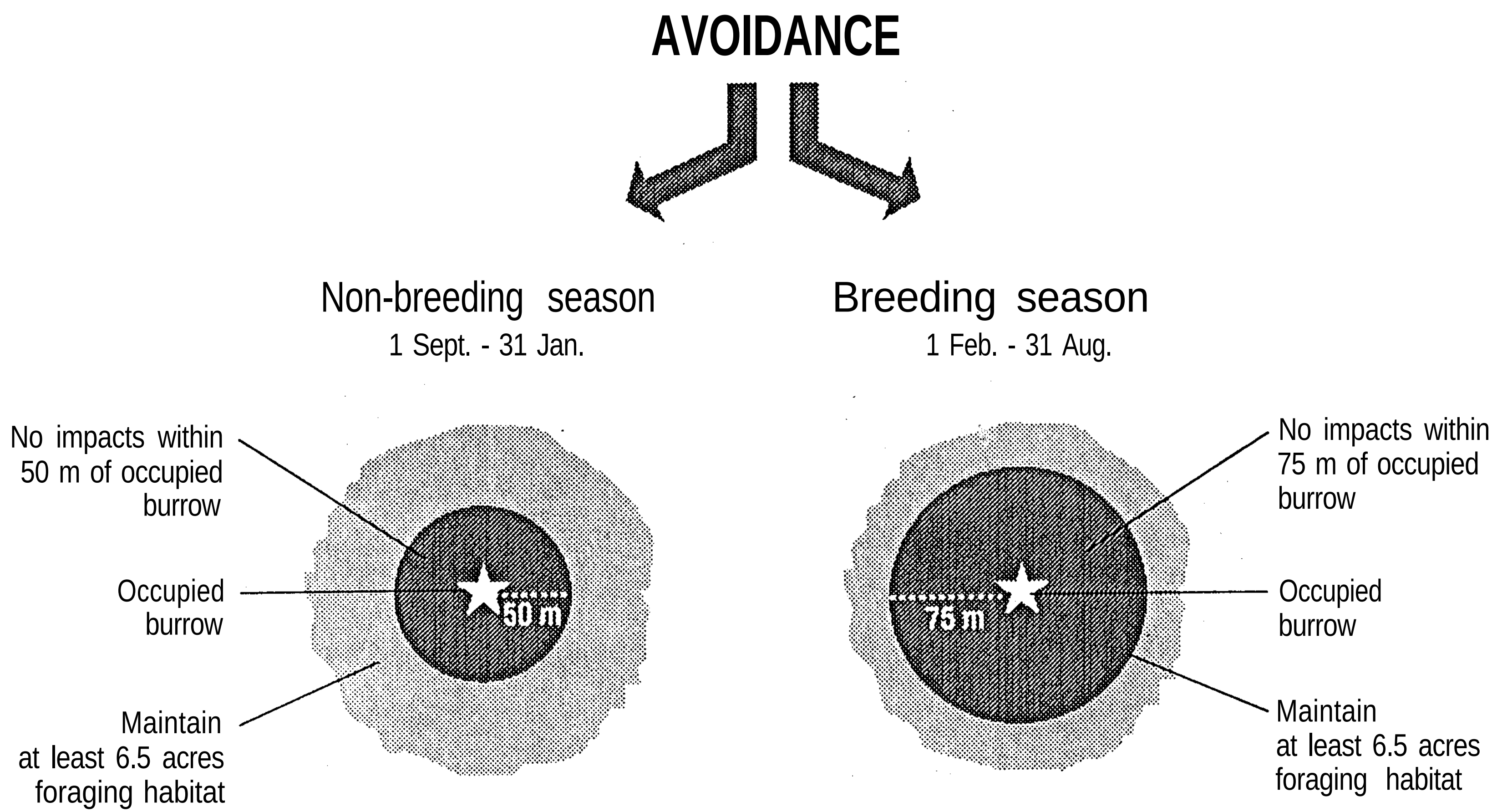

Figure 2. Burrowing owl mitigation guidelines.

ON-SITE MITIGATION
IF AVOIDANCE NOT MET

(More than 6.5 acres suitable habitat available)

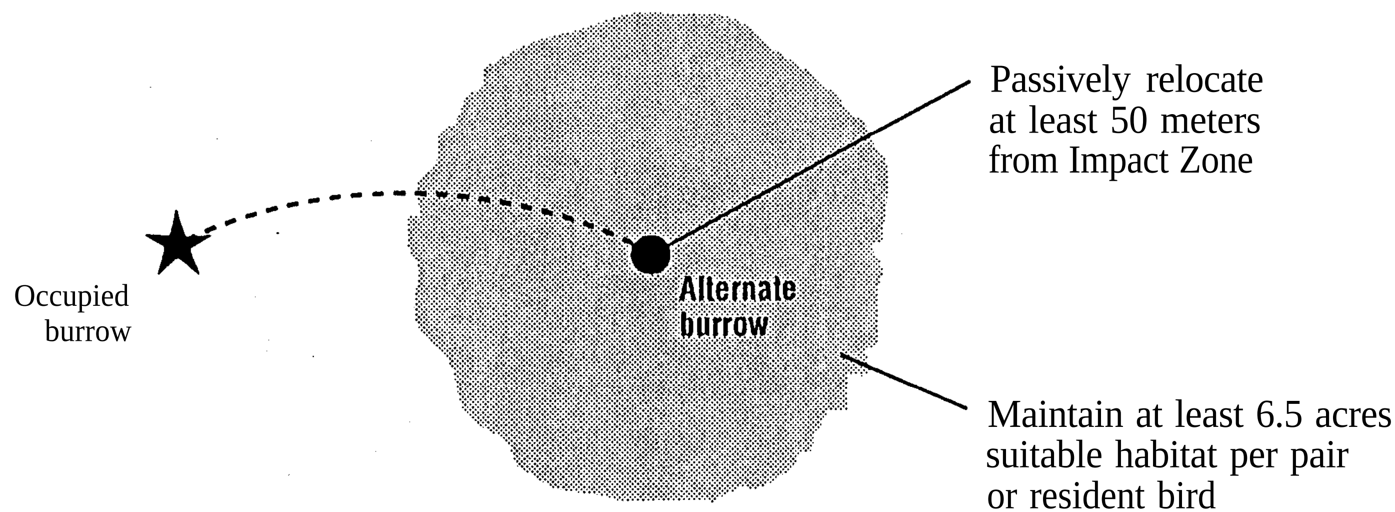

Figure 3. Burrowing owl mitigation guidelines.

during excavation to maintain an escape route for any animals inside the burrow.

Off-site Mitigation
If the project will reduce suitable habitat on-site below the threshold level of 6.5 acres per relocated pair or single bird, the habitat should be replaced off-site. Off-site habitat must be suitable burrowing owl habitat, as defined in the *Burrowing Owl Survey Protocol*, and the site approved by CDFG. Land should be purchased and/or placed in a conservation easement in perpetuity and managed to maintain suitable habitat. Off-site mitigation should use one of the following ratios:

1. Replacement of occupied habitat with occupied habitat: 1.5 times 6.5 (9.75) acres per pair or single bird.

2. Replacement of occupied habitat with habitat contiguous to currently occupied habitat: 2 times 6.5 (13.0) acres per pair or single bird.

3. Replacement of occupied habitat with suitable unoccupied habitat: 3 times 6.5 (19.5) acres per pair or single bird.

SECTION 3 LEGAL STATUS

The burrowing owl is a migratory bird species protected by international treaty under the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703-711). The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter, any migratory bird listed in 50 C.F.R. Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 C.F.R. 21). Sections 3503, 3503.5, and 3800 of the California Department of Fish and Game Code prohibit the take, possession, or destruction of birds, their nests or eggs. Implementation of the take provisions requires that project-related disturbance at active nesting territories be reduced or eliminated during critical phases of the nesting cycle (March 1 - August 15, annually). Disturbance that causes nest abandonment and/or loss of reproductive effort (e.g., killing or abandonment of eggs or young) or the loss of habitat upon which the birds depend is considered "taking" and is potentially punishable by fines and/or imprisonment. Such taking would also violate federal law protecting migratory birds (e.g., MBTA).

The burrowing owl is a Species of Special Concern to California because of declines of suitable habitat and both localized and statewide population declines. Guidelines for the Implementation of the California Environmental Quality Act (CEQA) provide that a species be considered as endangered or "rare" regardless of appearance on a formal list for the purposes of the CEQA (Guidelines, Section 15380, subsections b and d). The CEQA requires a mandatory findings of significance if impacts to threatened or endangered species are likely to occur (Sections 21001(c), 21083. Guidelines 15380, 15064, 15065). Avoidance or mitigation must be presented to reduce impacts to less than significant levels.

CEQA AND SUBDIVISION MAP ACT

CEQA Guidelines Section 15065 directs that a mandatory finding of significance is required for projects that have the potential to substantially degrade or reduce the habitat of, or restrict the range of a threatened or endangered species. CEQA requires agencies to implement feasible mitigation measures or feasible alternatives identified in EIR's for projects which will otherwise cause significant adverse impacts (Sections 21002, 21081, 21083; Guidelines, sections 15002, subd. (a)(3), 15021, subd. (a)(2), 15091, subd. (a).).

To be legally adequate, mitigation measures must be capable of "avoiding the impact altogether by not taking a certain action or parts of an action"; "minimizing impacts by limiting the degree or magnitude of the action and its implementation"; "rectifying the impact by repairing, rehabilitating or restoring the impacted environment"; "or reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action." (Guidelines, Section 15.370).

Section 66474 (e) of the Subdivision Map Act states "a legislative body of a city or county shall deny approval of a tentative map or parcel map for which a tentative map was not required, if it makes any of the following findings:... (e) that the design of the subdivision or the proposed improvements are likely to cause substantial environmental damage or substantially and avoidably injure fish and wildlife or their habitat". In recent court cases, the court upheld that Section 66474(e) provides for environmental impact review separate from and independent of the requirements of CEQA (Topanga Assn. for a Scenic Community v. County of Los Angeles, 263 Cal. Rptr. 214 (1989).). The finding in Section 66174 is in addition to the requirements for the preparation of an EIR or Negative Declaration.

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Thomsen, L. 1971. Behavior and ecology of burrowing owls on the Oakland Municipal Airport. Condor 73: 177-192.

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Appendix E

CDFG Staff Report on Burrowing Owl Mitigation

State of California

Memorandum

: "Div. Chiefs - IFD, BDD, NED, & WMD
Reg. Mgrs. - Regions 1, 2, 3, 4, & 5

Date : October 17, 1995

From : Department of Fish and Game

Subject : Staff Report on Burrowing Owl Mitigation

I am hereby transmitting the Staff Report on Burrowing Owl Mitigation for your use in reviewing projects (California Environmental Quality Act [CEQA] and others) which may affect burrowing owl habitat. The Staff Report has been developed during the last several months by the Environmental Services Division (ESD) in cooperation with the Wildlife Management Division (WMD) and regions 1, 2, and 4. It has been sent out for public review and redrafted as appropriate.

Either the mitigation measures in the staff report may be used or project specific measures may be developed. Alterative project specific measures proposed by the Department divisions/regions or by project sponsors will also be considered. However, such mitigation measures must be submitted to ESD for review. The review process will focus on the consistency of the proposed measure with Department, Fish and Game Commission, and legislative policy and with laws regarding raptor species. ESD will coordinate project specific mitigation measure review with WMD.

If you have any questions regarding the report, please contact Mr. Ron Rempel, Supervising Biologist, Environmental Services Division, telephone (916) 654-9980.

COPY Original signed by C.F Raysbrook

C. F. Raysbrook
Interim Director

Attachment

cc: Mr. Ron Rempel
Department of Fish and Game
Sacramento

STAFF REPORT ON BURROWING OWL MITIGATION

Introduction

The Legislature and the Fish and Game Commission have developed the policies, standards and regulatory mandates to protect native species of fish and wildlife. In order to determine how the Department of Fish and Game (Department) could judge the adequacy of mitigation measures designed to offset impacts to burrowing owls *(Speotyto cunicularia;* A.O.U. 1991) staff (WMD, ESD, and Regions) has prepared this report. To ensure compliance with legislative and commission policy, mitigation requirements which are consistent with this report should be incorporated into: (1) Department comments to Lead Agencies and project sponsors pursuant to the California Environmental Quality Act (CEQA); and (2) other authorizations the Department gives to project proponents for projects impacting burrowing owls.

This report is designed to provide the Department (including regional offices and divisions), CEQA Lead Agencies and project proponents the context in which the Environmental Services Division (ESD) will review proposed project specific mitigation measures. This report also includes preapproved mitigation measures which have been judged to be consistent with policies, standards and legal mandates of the Legislature,. the Fish and Game Commission and the Department's public trust responsibilities. Implementation of mitigation measures consistent with this report are intended to help achieve the conservation of burrowing owls and should compliment multi-species habitat conservation planning efforts currently underway. The *Burrowing Owl Survey Protocol and Mitigation Guidelines* developed by The California Burrowing Owl Consortium (CBOC 1993) were taken into consideration in the preparation of this staff report as were comments from other interested parties.

A range-wide conservation strategy for this species is needed. Any range-wide conservation strategy should establish criteria for avoiding the need to list the species pursuant to either the California or federal Endangered Species Acts through preservation of existing habitat, population expansion into former habitat, recruitment of young into the population, and other specific efforts.

California's burrowing owl population is clearly declining and, if declines continue, the species may qualify for listing. Because of the intense pressure for urban development within suitable burrowing owl nesting and foraging habitat (open, flat and gently rolling grasslands and grass/shrub lands) in California, conflicts between owls and development projects often occur. Owl survival can be adversely affected by disturbance and foraging habitat loss even when impacts to individual birds and nests/burrows are avoided. Adequate information about the presence of owls is often unavailable prior to project approval. Following project approval there is no legal mechanism through which to seek mitigation other than avoidance of occupied burrows or nests. The absence of standardized survey methods often impedes consistent impact assessment.

Burrowing Owl Habitat Description

Burrowing owl habitat can be found in annual and perennial grasslands, deserts, and arid scrublands characterized by low-growing vegetation (Zarn 1974). Suitable owl habitat may also include trees and shrubs if the canopy covers less than 30 percent of the ground surface. Burrows are the essential component of burrowing owl habitat. Both natural and artificial burrows provide protection, shelter, and nests for burrowing owls (Henny and Blus 1981). Burrowing owls typically use burrows made by fossorial mammals, such as ground squirrels or badgers, but also may use man-made structures such as cement culverts; cement, asphalt, or wood debris piles; or openings beneath cement or asphalt pavement.

Occupied Burrowing Owl Habitat

Burrowing owls may use a site for breeding, wintering, foraging, and/or migration stopovers. Occupancy of suitable burrowing owl habitat can be verified at a site by detecting a burrowing owl, its molted feathers, cast pellets, prey remains, eggshell fragments, or excrement at or near a burrow entrance. Burrowing owls exhibit high site fidelity, reusing burrows year after year (Rich 1984, Feeney 1992). A site should be assumed occupied if at least one burrowing owl has been observed occupying a burrow there within the last three years (Rich 1984).

CEQA Project Review

The measures included in this report are intended to provide a decision-making process that should be implemented whenever-there is potential for-an action or project to adversely affect burrowing owls. For projects subject to the California Environmental Quality Act (CEQA), the process begins by conducting surveys to determine if burrowing owls are foraging or nesting on or adjacent to the project site. If surveys confirm that the site is occupied habitat, mitigation measures to minimize impacts to burrowing owls, their burrows and foraging habitat should be incorporated into the CEQA document as enforceable conditions. The measures in this document are intended to conserve the species by protecting and maintaining viable' populations of the species throughout their range in California. This may often result in protecting and managing habitat for the species at sites away from rapidly urbanizing/developing areas. Projects and situations vary and mitigation measures should be adapted to fit specific circumstances.

Projects not subject to CEQA review may have to be handled separately since the legal authority the Department has with respect to burrowing owls in this type of situation is often limited. The burrowing owl is protected from "take" (Section 3503.5 of the Fish and Game Code) but unoccupied habitat is likely to be lost for activities not subject to CEQA.

Legal Status

The burrowing owl is a migratory species protected by international treaty under the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703-711). The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 C.F.R. Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 C.F.R. 21). Sections 3505, 3503.5, and 3800 of the California Department of Fish and Game Code prohibit the take, possession, or destruction of birds, their nests or eggs. To avoid violation of the take provisions of these laws generally requires that project-related disturbance at active nesting territories be reduced or eliminated during the nesting cycle (February 1 to August 31). Disturbance that causes nest abandonment and/or loss of reproductive effort (e.g., killing or abandonment of eggs or young) may be considered "take"' and is potentially punishable by fines and/or imprisonment.

The burrowing owl is a Species of Special Concern to California because of declines of suitable habitat and both localized and statewide population declines. Guidelines for the Implementation of the California Environmental Quality Act (CEQA) provide that a species be considered as endangered or "rare" regardless of appearance on a formal list for the purposes of the CEQA (Guidelines, Section 15380, subsections b and d). The CEQA requires a mandatory findings of significance if impacts to threatened or endangered species are likely to occur (Sections 21001 (c), 2103; Guidelines 15380, 15064, 15065). To be legally adequate, mitigation measures must be capable of "avoiding the impact altogether by not taking a certain action or parts of an action"; "minimizing impacts by limiting the degree or magnitude of the action and its implementation"; "rectifying the impact by repairing, rehabilitating or restoring the impacted environment"; "or reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action" (Guidelines, Section 15370). Avoidance or mitigation to reduce impacts to less than significant levels must be included in a project or the CEQA lead agency must make and justify findings of overriding considerations.

Impact Assessment

Habitat Assessment

The project site and a 150 meter (approximately 500 ft.) buffer (where possible and appropriate based on habitat) should be surveyed to assess the presence of burrowing owls and their habitat (Thomsen 1971, Martin 1973). If occupied habitat is detected on or adjacent to the site, measures to avoid, minimize, or mitigate the project's impacts to the species should be incorporated into the project, including burrow preconstruction surveys to ensure avoidance of direct take. It is also recommended that preconstruction surveys be conducted if the species was not detected but is likely to occur on the project site.

Burrowing Owl and Burrow Surveys

Burrowing owl and burrow surveys should be conducted during both the wintering and nesting seasons, unless the species is detected on the first survey. If possible, the winter survey should be conducted between December 1 and January 31 (when wintering owls are most likely to be present) and the nesting season survey should be conducted between April 15 and July 15 (the peak of the breeding season). Surveys conducted from two hours before sunset to one hour after, or from one hour before to two hours after sunrise, are also preferable.

Surveys should be conducted by walking suitable habitat on the entire project site and (where possible) in areas within 150 meters (approx. 500 ft.) of the project impact zone. The 150-meter buffer zone is surveyed to identify burrows and owls outside of the project area which may be impacted by factors -such as noise and vibration (heavy equipment, etc.) during project construction. Pedestrian survey transects should be spaced to allow 100 percent visual coverage of the ground surface. The distance between transect center lines should be no more than 30 meters (approx. 100 ft.) and should be reduced to account for differences in terrain, vegetation density, and ground surface visibility. To effectively survey large projects (100 acres or larger), two or more surveyors should be used to walk adjacent transects. To avoid impacts to owls from surveyors, owls and/or occupied burrows should be avoided by a minimum of 50 meters (approx. 160 ft.) wherever practical. Disturbance to occupied burrows should be avoided during all seasons.

Definition of Impacts

The following should be considered impacts to the species:

- Disturbance within 50 meters (approx. 160 ft.) Which may result in harassment of owls at occupied burrows;

- Destruction of natural and artificial burrows (culverts, concrete slabs and debris piles that provide shelter to burrowing owls); and

- Destruction and/or degradation of foraging habitat adjacent (within 100 m) of an occupied burrow(s).

Written Report

A report for the project should be prepared for the Department and copies should be submitted to the Regional contact and to the Wildlife Management Division Bird and Mammal Conservation Program. The report should include the following information:

- Date and time of visit(s) including name of the qualified biologist conducting surveys, weather and visibility conditions, and survey methodology;

- Description of the site including location, size, topography, vegetation communities, and animals observed during visit(s);

- Assessment of habitat suitability for burrowing owls;

- Map and photographs of the site;

- Results of transect surveys including a map showing the location of all burrow(s) (natural or artificial) and owl(s), including the numbers at each burrow if present and tracks, feathers, pellets, or other items (prey remains, animal scat);

- Behavior of owls during the surveys;

- Summary of both winter and nesting season surveys including any productivity information and a map showing territorial boundaries and home ranges; and

- Any historical information (Natural Diversity Database, Department regional files? Breeding Bird Survey data, American Birds records, Audubon Society, local bird club, other biologists, etc.) regarding the presence of burrowing owls on the site.

Mitigation

The objective of these measures is to avoid and minimize impacts to burrowing owls at a project site and preserve habitat that will support viable owls populations. If burrowing owls are detected using the project area, mitigation measures to minimize and offset the potential impacts should be included as enforceable measures during the CEQA process.

Mitigation actions should be carried out from September 1 to January 31 which is prior to the nesting season (Thomsen 1971, Zam 1974). Since the timing of nesting activity may vary with latitude and climatic conditions, this time frame should be adjusted accordingly. Preconstruction surveys of suitable habitat at the project site(s) and buffer zone(s) should be conducted within the 30 days prior to construction to ensure no additional, burrowing owls have established territories since the initial surveys. If ground disturbing activities are delayed or suspended for more than 30 days after the preconstruction survey, the site should be resurveyed.

Although the mitigation measures may be included as enforceable project conditions in the CEQA process, it may also be desirable to formalize them in a Memorandum of Understanding (MOU) between the Department and the project sponsor. An MOU is needed when lands (fee title or conservation easement) are being transferred to the Department.

Specific Mitigation Measures

1. Occupied burrows should not be disturbed during the nesting season (February 1 through August 3 1) unless a qualified biologist approved by the Department verifies through non-invasive methods that either: (1) the birds have not begun egg-laying and incubation; or (2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival.

2. To offset the loss of foraging and burrow habitat on the project site, a minimum of 6.5 acres of foraging habitat (calculated on a 100 m {approx. 300 ft.} foraging radius around the burrow) per pair or unpaired resident bird, should be acquired and permanently protected. The protected lands should be adjacent to occupied burrowing owl habitat and at a location acceptable to the Department. *Protection of additional habitat acreage per pair or unpaired resident bird may be applicable in some instances.* The CBOC has also developed mitigation guidelines (CBOC 1993) that can be incorporated by CEQA lead agencies and which are consistent with this staff report.

3. When destruction of occupied burrows is unavoidable, existing unsuitable burrows should be enhanced (enlarged or cleared of debris) or new burrows created (by installing artificial burrows) at a ratio of 2:1 on the protected lands site. One example of an artificial burrow design is provided in Attachment A.

4. If owls must be moved away from the disturbance area, passive relocation techniques (as described below) should be used rather than trapping. At least one or more weeks will be necessary to accomplish this and allow the owls to acclimate to alternate burrows.

5. The project sponsor should provide funding for long-term management and monitoring of the protected lands. The monitoring plan should include success criteria, remedial measures, and an annual report to the Department.

Impact Avoidance

If avoidance is the preferred method of dealing with potential project impacts, then no disturbance should occur within 50 meters (approx. 160 ft.) of occupied burrows during the nonbreeding season of September 1 through January 31 or within 75 meters (approx. 250 ft.) during the breeding season of February 1 through August 31. Avoidance also requires that a minimum of 6.5 acres of foraging habitat be *permanently* preserved contiguous with occupied burrow sites for each pair of breeding burrowing owls (with or without dependent young) or single unpaired resident bird. The configuration of the protected habitat should be approved by the Department.

Passive Relocation - With One-Way Doors

Owls should be excluded from burrows in the immediate impact zone and within a 50 meter (approx. 160 ft.) buffer zone by installing one-way doors in burrow entrances. One-way doors (e.g., modified dryer vents) should be left in place 48 hours to insure owls have left the burrow before excavation. Two natural or artificial burrows should be provided for each burrow in the project area that will be rendered biologically unsuitable. The project area should be *monitored daily for one* week to confirm owl use of burrows before excavating burrows in the immediate impact zone. Whenever possible, burrows should be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe should be inserted into the tunnels during excavation to maintain an escape route for any animals inside the burrow.

Passive Relocation - Without One-Way Doors

Two natural or artificial burrows should be provided for each burrow in the project area that will be rendered biologically unsuitable. The project area should be *monitored daily until the owls have relocated to the new burrows.* The formerly occupied burrows may then. be excavated. Whenever possible, burrows should be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe should be inserted into burrows during excavation to maintain an escape route for any animals inside the burrow.

Projects Not Subject to CEQA

The Department is often contacted regarding the presence of burrowing owls on construction sites, parking lots and other areas for which there is no CEQA action or for which the CEQA process has been completed. In these situations, the Department should seek to reach agreement with the project sponsor to implement the specific mitigation measures described above. If they are unwilling to do so, passive relocation without the aid of one-way doors is their only option based upon Fish and Game Code 3503.5.

Literature Cited

American Ornithologists Union (AOU). 1991. Thirty-eighth supplement to the AOU checklist of North American birds. *Auk* 108:750-754.

Feeney, L. 1992. Site fidelity in burrowing owls. Unpublished paper presented to Raptor Research Annual Meeting, November 1992. Seattle, Washington.

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Reproductive Success of Burrowing Owls Using Artificial Nest Burrows in Southeastern Idaho

by Bruce Olenick

Artificial nest burrows were implanted in southeastern Idaho f'or burrowing owls in the spring of 1986. These artificial burrows consisted of a 12" x 12" x 8" wood nesting chamber with rernovable top and a 6 foot corrugated and perforated plastic drainage pipe 6 inches in diameter (Fig. 1). Earlier investigators claimed that artificial burrows must provide a natural dirt floor to allow burrowing owls to modify the nesting tunnel and chamber. Contrary to this, the artificial burrow introduced here does not allow owls to modify the entrance or tunnel. The inability to change the physical dimensions of the burrow tunnel does not seem to reflect the owls' breeding success or deter them from using this burrow design.

In 1936, 22 artificial burrows were inhabited. Thirteen nesting attempts yielded an average clutch size of 8.3 eggs per breeding pair. Eight nests successfully hatched at least 1 nestling. In these nests, *67 of 75* eggs hatched (59.3%) and an estimated 61 nestlings (91.0%) fledged. An analysis of the egg laying and incubation periods showed that incubation commenced well after egg laying bega. Average clutch size at the start of incubation was 5.6 eggs. Most eggs tended to hatch synchronously in all successful nests.

Although the initial cost of constructing this burrow design may be slightly higher than a burrow consisting entirely of wood, the plastic pipe burrow offers the following advantages: (1) it lasts several field seasons without rotting or collapsing; (2) it may prevent or retard predation; (3) construction time is minimal; (4) it is easy to transport, especially over long distances; and (5) the flexible tunnel simplifies installation. The use of this artificial nest burrow design was highly successful and may prove to be a great resource technique for future management of this species.

For additional information on constructing this artificial nest burrow, contact Bruce Olenick, Department of Biology, Idaho State University, Pocatello, ID 83209.

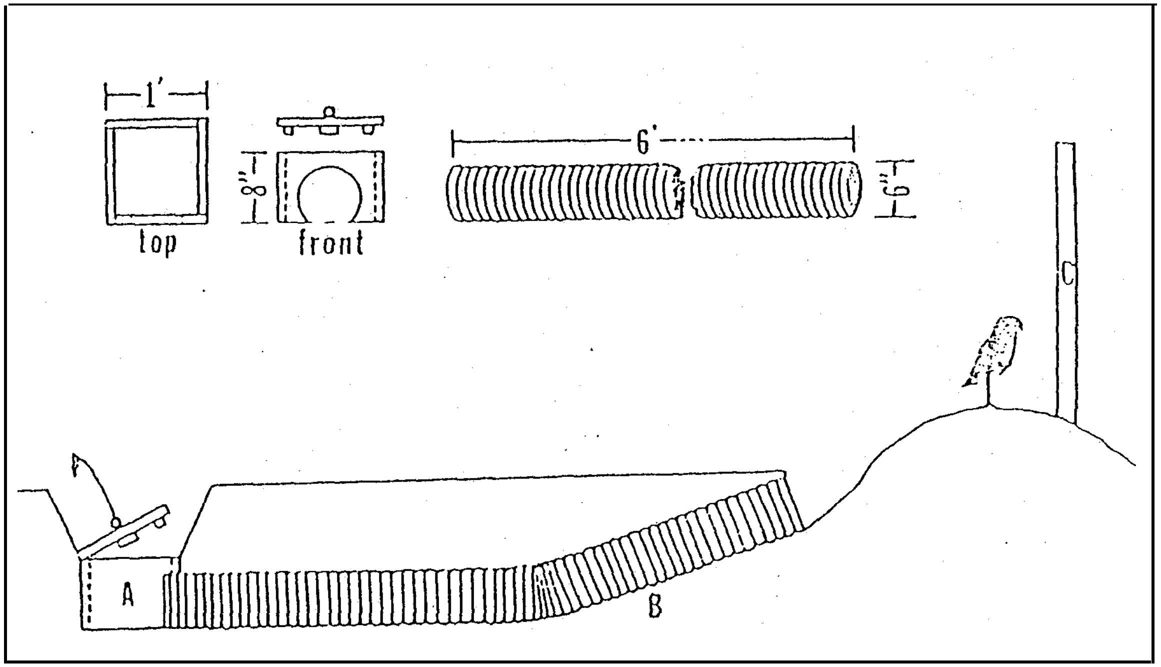


fig. 1 Artificial nest burrow design for burrowing owls Entire unit (including nest chamber) is buried 12" -- 18" below ground for maintaining thermal stability of the nest chamber. A= nest chamber, B = plastic pipe. C = perch.

ATTACHMENT A

Appendix F

Albion Report on Burrowing Owl Site Eviction

ALBION ENVIRONMENTAL, INC.
NATURAL AND CULTURAL RESOURCES CONSULTANTS

1414 SOQUEL AVENUE, SUITE 205
SANTA CRUZ, CALIFORNIA 95062

TELEPHONE (831) 469-9128
FACSIMILE (831) 469-9137

October 4, 2005

Jack Hall
Community Development Manager
Shea Homes
2580 Shea Center Drive
Livermore, CA. 94551

Summary report on burrowing owl eviction from the Davidon/Shea project site in Antioch, CA.

Dear Mr. Hall:

This is a summary report on the results of the burrowing owl (*Athene cunicularia*) passive relocation activities that Albion biologists Jack Barclay and Lindsay Harman carried out on the Davidon/Shea project site in Antioch on September 23, 26 and 28, 2005. The project site is located on the east side of Canada Valley Road approximately 0.4 miles north of Lone Tree Way in Antioch. The purpose of our work was to passively relocate burrowing owls from the Davidon/Shea project area to ensure no owls were present or harmed during initial grading. Prior to beginning the passive relocation we requested the limits of the work area be marked in the field so we could accurately determine the areas that needed to be treated with one-way door exclusion devices.

We observed four burrowing owls on the project area when we began passive relocation activities on September 23, 2005. We had previously documented 9 burrowing owls on the site and had captured and banded 7 of them between September 1-7. The owls had been using numerous burrows and roosts on the site but often they were on the rocky berm running through the center of the project area along the west side of the creek. This berm has many rock piles that provided shade and cover for the burrowing owls. The four burrowing owls flew to various burrow locations in the surrounding habitat as we surveyed the site and all four owls flew off the project area as we began installing one-way doors.

We walked the entire project area and installed one-way doors in all burrows and cavities potentially suitable for burrowing owl occupancy. We installed 41 one-way doors in 4 locations on the project area; on the hill in the northwest corner of the property, along the rocky berm parallel to the west side of creek, in a soil pile on the east side of the creek and on the slope at the northeast portion of the project site. We left all burrows outside the limits of grading open to help facilitate owls moving off of the project site. Leaving open burrows adjacent to the project area provided cover for the owls while they are transitioning to new burrow locations. Because of the close proximity of burrows we recommended that the work area be clearly marked or fenced to ensure ground disturbing activity stayed inside the marked limits of grading.

I returned to the site on September 26 to determine if owls had left the site. Grading was scheduled to begin if all one-way doors were still intact and owls were not observed using burrows on the project area. After inspecting the site I observed three owls still using the rocky berm in the center of the project area. As I approached they flew off the project area and I inspecting the area for available burrows. Owls were still roosting on the berm but only appeared to be using the rocks for shade or cover because I did not observe any new burrows or cavities and all the one-way doors were still intact. After the site was clear of owls and all cavities were inspected I began removing one-way doors in preparation for grading, which was to begin immediately. As I finished removing the one-way doors on the berm, one owl from off the site flew into the berm and disappeared down one of the burrows. Such activity is unusual and if I thought an owl might return to the berm immediately before it was to be graded I would not have removed the doors. After the owl disappeared, I immediately explained to the contractor that he should not grade that portion of the site. I reinstalled 9 one-way doors in the area where the owl disappeared and put flagging around this area to prevent any ground disturbance. I also explained to the contractor that these new one-way doors should be left in place for 48 hours and the area should be surveyed again on September 28. I monitored grading on the remaining portion of the site.

Jack and I returned on September 28, 2005 to inspect the work area and the one-way doors in the exclusion area (berm). We surveyed the berm, inspected each one-way door, looked for newly opened burrows, and checked for any newly created cavities. We did not observe any burrowing owls in the exclusion zone. After thoroughly inspecting the site we concluded that all suitable burrows and cavities were still closed and grading could begin in this area. We monitored grading of this remaining portion of the project area.

In summary, the eviction of burrowing owls from project area was successful, although it was delayed for 48 hours because one owl was very persistent at wanting to continue to use the rocky berm. After careful inspection of one-way doors, reinstalling one-way doors on the rocky berm and carefully monitoring the site prior to and during grading we concluded that burrowing owls had vacated the areas to be graded and no owls were harmed during the initial grading. Please contact me if you have any questions about this report.

Sincerely,

Lindsay Harman

Lindsay Harman
Wildlife Biologist

Appendix G

City Council RDA Allocation
Resolution No. 2004/118

STAFF REPORT TO THE RDA COMMITTEE FOR CONSIDERATION AT THE MEETING OF JUNE 28, 2004

Prepared by: Tina Wehrmeister, Senior Planner

Approved by: Joseph G. Brandt, Director of Community Development

Date: June 24, 2004

Subject: Davidon / Jacuzzi Property

PROJECT INFORMATION

Applicant: Davidon Homes

Owner: Tristar Land Investment Corporation

Location: 170 acres generally located west of the future State Route 4 Bypass and north of the McBail residential project being developed north of Lone Tree Way (a portion of the former Jacuzzi family properties – see Attachment A for vicinity map). (APN: 053-060-021, and portion of 053-072-013)

General Plan / Zoning: The site is part of the East Lone Tree Specific Plan (FUA 2) and is designated for low and medium low density residential with open space areas as shown in the Specific Plan (see Attachment B). The Specific Plan allows a maximum of four dwelling units per acre (6,000 square foot minimum lot area) for low-density areas and six dwelling units per acre (4,000 square foot minimum lot area) for medium low density areas.

The General Plan states that the project area should be developed consistent with the Low and/or Medium Density Residential land use category which allows four and six dwelling units to the acre respectively.

Requested Allocations: The applicant has amended the number of requested allocations from 579 to 562 and will discuss the yearly break down of allocations at the RDAC meeting. The site plan has not been amended. The lot reduction will be reflected in future entitlement applications.

PROJECT DESCRIPTION / BACKGROUND

The project consists of a mix of low and medium density residential lots with minimum lot sizes of 6,000 s.f. (8,217 s.f. average size) and 5,000 s.f. (6,566 s.f. average size) respectively. It should be noted that the 5,000 s.f. minimum lots exceed the minimum allowed by the Specific Plan which is 4,000 s.f. in Medium Low Density Areas. The applicant is proposing 27 acres of open space including trails with connections to the subdivision. In addition, an 8 acre neighborhood park is shown with five of the eight acres developed similar to other neighborhood parks. The Specific Plan envisioned a fully developed 8-acre neighborhood park at this location, but this type of detail will be resolved at the Tentative Map/Planned Development entitlement level.

The applicant was denied a request for 549 units in the first round of the RDA process last year. The 2003 plan included a third high school site. At that time, the Council felt that the applicant did not provide an acceptable level of community benefit noting that the project was not offering to front infrastructure costs for the employment / commercial portion of Future Urban Area 2 despite requirements contained in the specific plan; that the proposal did not provide a sufficient variety in product or street design; and that the applicant was not providing any other significant community benefit other than the high school site which was to be located on acreage previously slated for open space.

SURROUNDING LAND USES

The project is bounded by existing single family residential development on the west, the McBail single family residential development in construction to the south, the future State Route 4 Bypass on the east, and Laurel Rd and the proposed Bixby residential development to the north.

SITE PLANNING & DEVELOPMENT ISSUES

Open Space: The applicant shows the ridgeline open space area as was offered to the City as a gift from the Jacuzzi family. A copy of the agreement is attached (see Attachment C). The land was never officially accepted by the City. A condition of future entitlements for the project would require that the applicant take the necessary steps to annex the property into Lighting and Landscape District 10 to assure proper fire protection, access, public liability protection, and maintenance. The applicant would be required to install trails as shown on the plans and could, as a community benefit, provide such items as bench seating, look out areas, and waste receptacles.

Neighborhood Park: The East Lone Tree Specific Plan requires an eight acre active community park. Future entitlement plans would need to reflect this requirement. The plans currently show a five acre active park. The neighborhood park improvements would be eligible for reimbursement. As an additional community benefit, the applicant could offer to not request reimbursement, allowing the City to utilize the funds to improve other neighborhood parks.

Specific Plan Financing Requirements: The East Lone Tree Specific Plan and its corresponding Financial Plan intended that funding for major infrastructure links in the employment areas east of the State Route 4 Bypass be fronted by residential development on the west side of the Bypass with possible reimbursement, at Council's discretion, for some or all of those funds (see Attachment D for a summary of infrastructure requirements contained in the Specific and Financial plans).

The applicant is offering a non-reimbursable Community Facilities District (CFD) lien of up to $15,000 per residential lot for construction of the infrastructure identified by the Financial Plan (see Attachment E). This offer, along with the participation of the other property owners north of McBail in the CFD, will be adequate to construct the remaining infrastructure improvements north of the McBail properties. If the CFD is not formed, it is estimated that the offer will be adequate to construct full four lane Slatten Ranch Rd. from the McBail north boundary to Laurel Rd with sewer and water OR two lane Slatten Ranch Rd. and the East Antioch Creek improvements needed to move the employment / regional retail areas out of the flood zone.

This offer will provide the necessary funding to construct Slatten Ranch Rd. from the northern McBail property line to Laurel Road and the State Route 4 Bypass interchange. Staff believes this link is critical in order to attract regional retail and employment users to the area. Currently, the development interest in the area has been from large regional retail entities which would provide significant revenues to the City. Without the completion of Slatten Ranch Rd., it is likely that those retail entities will locate in the area however, most likely in Oakley or Brentwood (see last paragraph of Attachment F, EPS market study).

It should be noted that the applicant's offer is <u>non-reimbursable</u>. This is over and above the specific plan requirement which discusses possible reimbursement to residential developers.

The above offer is contingent upon the execution of a Development Agreement providing that Davidon has no further obligation to construct additional off-site infrastructure that is not project related and that bonds will be sold and CFD assessment will be payable only as necessary to complete the improvements concurrent with the completion of the State Route 4 Bypass.

Should a CFD not be established, and an alternative funding mechanism acceptable to both Davidon and the City not be devised, or should the Development Agreement not be entered into, any allocation of residential units under the RDA process would be void.

State Route 4 Bypass Noise Issues: It has recently been determined that noise from the future Bypass may exceed the City's noise standards for residential development. The Community Development Department will address this issue in the near future before the Planning Commission and City Council. Most likely, it will be requested that the noise standards in the General Plan be amended to be consistent with the State standards along freeways. This issue may impact site planning during the entitlement process for this project.

SUMMARY OF PROJECT BENEFITS

Below is a brief description of the community benefits provided by the project and their timing; organized by each evaluation category approved by the City Council. The maximum possible points for each category are shown in the table, but no points have been assigned. The applicant's description of the project and community benefits is attached to the plan set (note that Attachment E modifies the community benefit offer). Only items that can be considered above and beyond typical development requirements are included in the table below.

CATEGORY	POINTS POSSIBLE	COMMITTEE NOTES
A. PHYSICAL IMPROVEMENTS	**200 POINTS**	**NOTES**
A-1 Traffic and Transportation	**75 points**	
• Non-reimbursable Community Facilities District (CFD) lien of up to $15,000 per residential lot for construction of the infrastructure identified by the East Lone Tree Specific Plan and Financial Plan.		
A-2 Utilities and Infrastructure	**75 points**	
• See above		
A-3 Open Space and Parks	**25 points**	
• The project is providing 27 acres of passive open space and 8 acres of park land, five acres to be developed. These facilities are required by an offer of dedication of land to the City by previous owners and the specific plan respectively.		
A-4 Natural Features	**25 points**	
• The applicant references the 27 acres of passive open space for this category. • This acreage was previously offered to the City and is not considered a benefit over and above standard requirements by staff.		

CATEGORY	POINTS POSSIBLE	COMMITTEE NOTES
B. DESIGN	**100 POINTS**	
B-1 Site Design	**25 points**	
• The applicant is providing 5,000 and 6,000 s.f. lot types and states that many of the lots exceed the minimums.		
B-2 Architecture and Design Quality	**25 points**	
• The applicant submitted working architectural plans, which were included in the plans distributed to the RDAC. The applicant notes that they are developing two distinct product lines and that design updates may occur during the life of the project. Staff feels that the architecture is typical of homes currently under construction in Antioch.		
B-3 Energy and Efficiency	**25 points**	
• The applicant states that dual pane windows, tech shield roof sheathing, re-circulating hot water systems, and energy saver furnaces, air conditioners, and appliances will be installed as standard features on all homes. • The applicant states that developer installed front yard landscaping will utilize water saving techniques and plant materials.		
B-4 Public Safety	**25 points**	
• The applicant states that Class A fire resistant roof materials will be utilized on all homes. Class C roof material is the minimum required by the Building Code for residences. The Class A materials offered by the applicant is less flammable. • As a standard feature, homes will be wired for security systems with an option for digital surveillance.		
C. ADDITIONAL COMMUNITY BENEFITS AND CONTRIBUTIONS	**200 POINTS**	
C-1 School Mitigation	**60 points**	
• The project will participate in the new AUSD CFD 2004-1.		

CATEGORY	POINTS POSSIBLE	COMMITTEE NOTES
C-2 Economic Development Benefits	**60 points**	
• The non-reimbursable infrastructure funding offer will provide the necessary improvements to attract regional retail and employment projects to FUA2. Future regional retail projects in particular will provide significant sales tax revenue to the City.		
C-3 Contributions to Special Projects	**80 points**	
• None		
TOTAL POINTS (500 points possible)		

RECOMMENDATION

According to the RDA Ordinance, one of the primary objectives of this process is to implement the City's goal that new residential developments make positive contributions to the community, and not just mitigate impacts. The community benefits offered by Davidon Homes are significant in boosting the City's ability to attract regional retail and employment development in FUA2.

Staff recommends that the RDAC recommend approval of allocations for this project.

ATTACHMENTS

A. Vicinity Map
B. East Lone Tree Specific Plan Land Use Map
C. Jacuzzi Open Space Agreement
D. FUA 2 Commercial/Employment Infrastructure Requirements
E. Letter from applicant dated June 23, 2004 modifying offer
F. Excerpt from EPS Antioch Retail Market Study

RESIDENTIAL DEVELOPMENT ALLOCATION COMMITTEE RECOMMENDATION FOR APPROVAL OF ALLOCATION OF RESIDENTIAL UNITS FOR THE DAVIDON / JACUZZI PROPERTIES RESIDENTIAL DEVELOPMENT

WHEREAS, the Residential Development Allocation Committee (RDAC) of the City of Antioch did receive an application from Davidon Homes for the approval of 562 residential development allocations for a 170 acre project generally located west of the future State Route 4 Bypass and north of the McBail residential project being developed north of Lone Tree Way (APN: 053-060-021, and portion of 053-072-013) (RDA-04-01); and

WHEREAS, the approval of residential development allocations does not constitute an entitlement to develop a project and the allocation process is not subject to the provisions of the California Environmental Quality Act; and

WHEREAS, the RDAC duly gave notice of public meeting as required by law; and

WHEREAS, on June 28, 2004 the RDAC duly held a public meeting, received and considered evidence, both oral and documentary; and

WHEREAS, it is hereby understood that any contributions, mitigations, and other benefits that were agreed to as part of this allocation process shall be incorporated into future entitlement submittal(s).

NOW THEREFORE BE IT RESOLVED that the RDAC does hereby recommend that Davidon Homes be granted 562 residential development allocations *insert yearly break down* subject to the following items and community benefits that the applicant has agreed to provide:

1. That the overall project description, facilities, layout, and phasing shall be substantially in conformance with the plans reviewed by the RDAC.

2. That the applicant shall provide dual pane windows, tech shield roof sheathing, re-circulating hot water systems, Class A fire resistant roofs, prewired security alarm systems, and energy saver furnaces, air conditioner, and appliances as standard features on all homes.

3. That front yard landscaping shall utilize water saving techniques and plant materials.

4. That the applicant shall contribute a non-reimbursable Community Facilities District (CFD) lien of up to $15,000 per residential lot for construction of infrastructure identified by the East Lone Tree Financial Plan. This offer is contingent on the successful formation of a CFD that will provide for the construction of all such infrastructure with fair and reasonable liens on the other

properties in FUA 2. Fair and reasonable liens shall be determined by a study by EPS which is presently being conducted.

The City and Davidon Homes shall enter into a Development Agreement (DA) which shall provide the framework for entitlement of 562 single family units. Davidon understands that RDA approval is not an entitlement and the plat provided for the RDA process showing 579 units shall be revised as part of the tentative map process. The DA shall further provide that Davidon has o obligation to construct additional off-site infrastructure that is not directly project related. The DA shall also confirm that bonds will be sold and CFD assessments will be payable only as necessary to complete the improvements approximately concurrent with the completion of the State Route 4 Bypass.

5. That Davidon Homes shall participate in the new AUSD CFD 2004-1.

* * * * * * *

I HEREBY CERTIFY that the foregoing resolution was passed and adopted by the Residential Development Allocation Committee of the City of Antioch, County of Contra Costa, State of California at a regular meeting of said Residential Development Allocation Committee held on the 28th day of June, 2004 by the following vote:

____

Victor Carniglia
Secretary to the RDAC

RESIDENTIAL DEVELOPMENT ALLOCATION COMMITTEE RECOMMENDATION FOR APPROVAL OF ALLOCATION OF RESIDENTIAL UNITS FOR THE DAVIDON / JACUZZI PROPERTIES RESIDENTIAL DEVELOPMENT

WHEREAS, the Residential Development Allocation Committee (RDAC) of the City of Antioch did receive an application from Davidon Homes for the approval of 562 residential development allocations for a 170 acre project generally located west of the future State Route 4 Bypass and north of the McBail residential project being developed north of Lone Tree Way (APN: 053-060-021, and portion of 053-072-013) (RDA-04-01); and

WHEREAS, the approval of residential development allocations does not constitute an entitlement to develop a project and the allocation process is not subject to the provisions of the California Environmental Quality Act; and

WHEREAS, the RDAC duly gave notice of public meeting as required by law; and

WHEREAS, on June 28, 2004 the RDAC duly held a public meeting, received and considered evidence, both oral and documentary; and

WHEREAS, it is hereby understood that any contributions, mitigations, and other benefits that were agreed to as part of this allocation process shall be incorporated into future entitlement submittal(s).

NOW THEREFORE BE IT RESOLVED that the RDAC does hereby recommend that Davidon Homes be granted 562 residential development allocations over four years (2005 – 125; 2006 – 150; 2007 – 150; 2008 – 137) subject to the following items and community benefits that the applicant has agreed to provide:

1. That the overall project description, facilities, layout, and phasing shall be substantially in conformance with the plans reviewed by the RDAC.

2. That the applicant shall provide dual pane windows, tech shield roof sheathing, re-circulating hot water systems, Class A fire resistant roofs, prewired security alarm systems, and energy saver furnaces, air conditioner, and appliances as standard features on all homes.

3. That front yard landscaping shall utilize water saving techniques and plant materials.

4. That the applicant shall contribute a non-reimbursable Community Facilities District (CFD) lien of up to $15,000 per residential lot for construction of infrastructure identified by the East Lone Tree Financial Plan. This offer is contingent on the successful formation of a CFD that will provide for the construction of all such infrastructure with fair and reasonable liens on the other

properties in FUA 2. Fair and reasonable liens shall be determined by a study by EPS which is presently being conducted.

The City and Davidon Homes shall enter into a Development Agreement (DA) which shall provide the framework for entitlement of 562 single family units. Davidon understands that RDA approval is not an entitlement and the plat provided for the RDA process showing 579 units shall be revised as part of the tentative map process. The DA shall further provide that Davidon has no obligation to construct additional off-site infrastructure that is not directly project related. The DA shall also confirm that bonds will be sold and CFD assessments will be payable only as necessary to complete the improvements approximately concurrent with the completion of the State Route 4 Bypass.

5. That Davidon Homes shall participate in the new AUSD CFD 2004-1.

* * * * * * *

I HEREBY CERTIFY that the foregoing resolution was passed and adopted by the Residential Development Allocation Committee of the City of Antioch, County of Contra Costa, State of California at a regular meeting of said Residential Development Allocation Committee held on the 28th day of June, 2004 by the following vote:

AYES: Azevedo, Henry

NOES: Mayor Freitas, Conley

Victor Carniglia
Secretary to the RDAC

STAFF REPORT TO THE CITY COUNCIL
FOR CONSIDERATION AT THE MEETING OF SEPTEMBER 14, 2004

Prepared by:	Tina Wehrmeister, Senior Planner
Reviewed by:	Victor Carniglia, Deputy Director of Community Development
Approved by:	Joseph G. Brandt, Director of Community Development
Date:	September 3, 2004
Subject:	RDA-04-1 Davidon / Jacuzzi Property

RECOMMENDATION

It is recommended that the City Council approve an allocation of 562 single family residential units over four years (2005 – 125; 2006 – 150; 2007 – 150; 2008 – 137), subject to conditions in the attached resolution.

BACKGROUND / DISCUSSION

Davidon Homes requests an allocation of 562 single family residential units over four years (2005 – 125; 2006 – 150; 2007 – 150; 2008 – 137) under the Residential Development Allocation Program. The site is approximately 170 acres and is generally located west of the future State Route 4 Bypass and north of the McBail residential project being developed north of Lone Tree Way (APN: 053-060-021, and portion of 053-072-013).

The RDAC reviewed this application on June 28, 2004. RDA applications are required to achieve at least 50% of the total points possible to be eligible to receive an allocation. The project received an overall score of 59% (298 out of 500). The RDAC did not take an action on the project as the vote was split (Noes – Freitas, Conley; Ayes – Azevedo, Henry).

There was some concern expressed at the RDAC meeting regarding the CFD lien offer which was worded as up to $15,000 per unit. The applicant has attempted to address this concern with a revised community benefit offer (see Attachment “D”). The applicant is now offering a firm $15,000 per unit. Additionally, any future reimbursement owed to Davidon for infrastructure improvements funded by the CFD is offered to the City for additional community benefit improvements. The applicant has also submitted new enhanced architectural renderings of the two products proposed for the development. The Design Review Board will review architecture as part of the entitlement process however; any architectural features that the Council considers a community enhancement should be made a part of the RDA resolution.

TW:tll

The Planning Commission recommended approval of allocations for this project on July 21, 2004. Minutes from this meeting are attached.

An RDA approval is a non-entitlement action. The purpose of the RDA process is to determine the number of units a developer may submit for entitlement. The RDA process should not be construed as an approval of subdivision design or density. Future entitlement applications may require significant redesign and layout departure from the RDA map. Future entitlement applications may be denied or may be approved for fewer units than the RDA approval.

FINANCIAL IMPACT

The applicant is offering a community benefit contribution of $15,000 per residential unit for construction of infrastructure identified by the East Lone Tree Financial Plan (ELTSP). This offer could provide the majority of funding necessary to construct the full four lanes of Slatten Ranch Road from the northern McBail property line to Laurel Road and the State Route 4 Bypass interchange. Ultimately, these funds will be combined with other funds from residential, commercial and employment developments in the ELTSP area to construct all “backbone” infrastructure improvements in that area. Staff believes construction of the Slatten Ranch Road link is critical in order to attract regional retail and employment users to the area. Currently, the development interest in the area has been from large regional retail entities which would provide significant sales tax revenues to the City. A conservative estimate of the amount of sales tax the area north of Slatten Ranch may generate is $1.8 to $2 million/yr.

Additional funds may be generated for community benefit / enhancement use pending future studies regarding the reimbursement of CFD improvements.

OPTIONS

1. Continue the item for further discussion.

2. Deny the request for residential development allocations.

ATTACHMENTS

A: June 28, 2004 RDAC Staff Report
B: Planning Commission minutes
C: RDAC Scoring
D: Revised Offer

RESOLUTION NO. 2004/118

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ANTIOCH APPROVING AN ALLOCATION OF RESIDENTIAL UNITS FOR THE DAVIDON / JACUZZI SUBDIVISION

WHEREAS, the City Council of the City of Antioch did receive an application from Davidon Homes for the approval of development allocations for 562 single family residential units over four years (2005 – 125; 2006 – 150; 2007 – 150; 2008 – 137) for an approximately 170 acre site generally located west of the future State Route 4 Bypass and north of the McBail residential project being developed north of Lone Tree Way (APN: 053-060-021, and portion of 053-072-013) (RDA-04-1); and

WHEREAS, the City Council did receive a recommendation for approval of residential allocations for this project from the Planning Commission; and

WHEREAS, the approval of residential development allocations does not constitute an entitlement to develop a project. The City may deny a future entitlement application, or approve such an application for fewer units than the 562 allocations requested; and

WHEREAS, the allocation process is not subject to the provisions of the California Environmental Quality Act; and

WHEREAS, the City Council duly gave notice of public meeting as required by law; and

WHEREAS, on September 14, 2004 the City Council duly held a public meeting, received and considered evidence, both oral and documentary; and

WHEREAS, it is hereby understood that any contributions, mitigations, and other benefits that were agreed to as part of this allocation process shall be incorporated into future entitlement submittal(s).

NOW THEREFORE BE IT RESOLVED that the City Council does hereby APPROVE 562 single family residential units over four years (2005 – 125; 2006 – 150; 2007 – 150; 2008 – 137), subject to the following items and community benefits that the applicant has agreed to provide:

1. That the applicant shall provide dual pane windows, tech shield roof sheathing, re-circulating hot water systems, Class A fire resistant roofs, prewired security alarm systems, and energy saver furnaces, air conditioner, and appliances as standard features on all homes.

2. That front yard landscaping shall utilize water saving techniques and plant materials.

3. That the applicant shall contribute a non-reimbursable Community Facilities District (CFD) lien of $15,000 per residential lot for construction of infrastructure identified by the East Lone Tree Financial Plan. This offer is contingent on the successful formation of a CFD that will provide for the construction of all such infrastructure with

fair and reasonable liens on the other properties in FUA 2. Fair and reasonable liens shall be determined by a study by EPS which is presently being conducted.

4. The City and Davidon Homes shall enter into a Development Agreement (DA) which shall provide the framework for entitlement of the project. Davidon understands that RDA approval is not an entitlement and the plat provided for the RDA process showing 579 units shall be revised as part of the tentative map process. The DA shall further provide that Davidon has no obligation to construct additional off-site infrastructure that is not directly project related. The DA shall also confirm that bonds will be sold and CFD assessments will be payable only as necessary to complete the improvements approximately concurrent with the completion of the State Route 4 Bypass.

5. Upon finalization of the CFD, the City may determine that Davidon's contribution has exceeded that required for completion of East Lone Tree Specific Plan infrastructure. In this case, the excess funds shall be available for application to other projects enhancing the economic development of Antioch. The use of any excess funds shall be at the direction of the City Council.

6. That Davidon Homes shall participate in the new AUSD CFD 2004-1.

* * * * * * *

I HEREBY CERTIFY that the foregoing resolution was passed and adopted by the City Council of the City of Antioch at a regular meeting thereof, held on the 14th day of September, 2004 by the following vote.

AYES: Council Members Davis, Conley and Simonsen

NOES: Mayor Freitas and Council Member Kalinowski

ABSENT: None

____

L. JOLENE MARTIN, City Clerk

Appendix H

USACE and CDFG Jurisdictional Determinations

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA 95814-2922

REPLY TO
ATTENTION OF

December 9, 2003

Regulatory Branch (200200674)

Richard Loewke
Richard Loewke AICP Planning Consultant
55 Oak Trail Court
Alamo, California 94507-2502

Dear Mr. Loewke:

This letter concerns the 10/8/02 wetland delineation for the proposed Rolling Hills Ranch project site submitted to this office for verification on your behalf. This site is located in Section 34, Township 2 North, Range 2 East, MDB&M, Contra Costa County, California.

Based on the available information the 0.17-acre wetland, identified as temporary swale in your October 8, 2002, Request for Verification of Non-Jurisdictional Status of Swale Located on Property in Antioch, is isolated with no apparent interstate commerce connection. This wetland is not currently regulated by the Corps under the Clean Water Act. This disclaimer of jurisdiction is only for Section 404 of the Federal Clean Water Act. Other Federal, State, and local laws may apply to your activities. In particular, you may need authorization from the California State Water Resources Control Board and/or the U.S. Fish and Wildlife Service.

This verification is valid for five years from the date of this letter unless new information warrants revision of the determination before the expiration date. A notice of appeal options is enclosed. You should provide a copy of this to all other affected parties. Please refer to identification number 200200674 in any future correspondence concerning this project. If you have any questions, please write to William Guthrie at the letterhead address, or email William.H.Guthrie@usace.army.mil, or telephone 916-557-5269.

Sincerely,

Michael Finan
Chief, Delta Office

Enclosure(s)

Copy furnished without enclosure(s):

George Day, Storm Water and Water Quality Certification Unit, Central Valley Regional Water Quality Control Board, 3443 Routier Road, Suite A, Sacramento, California 95827-3003

Oscar Balaguer, Chief, Water Quality Certification Unit, California State Water Resources Control Board, 1001 I Street, Sacramento, California 95814

Michael Wood, Michael Wood Biological Consulting, 65 Alta Hill Way, Walnut Creek, California 94595

RICHARD T. LOEWKE, AICP
PLANNING CONSULTANT

January 22, 2003

California Department of Fish and Game
Central Coast Region 3
P. O. Box 47
Yountville, CA 94599

Warden Nicole Kozicki
P. O. Box 284
Moraga, CA 94556

SUBJECT: 1603 Notification #R3-2002-0917 – Acceptance of CDFG Mitigation

Dear Nicole and Department Staff:

The above referenced Section 1603 Notification package was originally transmitted to you on October 30, 2002. The application identified the planned removal of a temporary drainage swale measuring 0.17 acres, located on property owned by Davidon Homes in Southeast Antioch. Following initial review of these materials, a field visit was conducted on November 19, 2002 by Warden Nicole Kozicki and Dick Loewke. This meeting resulted in Warden Kozicki's determination that the subject temporary swale currently provides water filtering benefits, which may be replaced in kind. Specifically, Warden Kozicki recommended that the property owner agree, as part of planned development on this 160-acre site, to replace the swale by means of one of the following alternatives:

(a) Inclusion of 0.17 acres of replacement open drainage course(s) within the project boundaries having similar filtering benefits.
(b) Inclusion of an integrated storm drainage system filtering mechanism which employs low flow soil percolation through rock layers.

Details of the selected alternative (or combination thereof) shall be included on the project improvement plans, and submitted to Warden Kozicki for review and approval prior to commencement of work. This water filtering feature may be referenced as part of the independent submittal and permit requirements of the Regional Water Quality Control Board.

Thank you for your assistance and guidance in this matter.

Very truly yours,

Richard T. Loewke, AICP
Planning Consultant

AGREED TO BY DAVIDON HOMES:
1600 South Main Street, Suite 150
Walnut Creek, CA 94596
Tel.: (925) 945-8000

By: ______________________
Jeff Thayer Date

Cc: Victor Carniglia, City of Antioch

R I C H A R D T. L O E W K E, A I C P
P L A N N I N G C O N S U L T A N T

October 30, 2002

California Department of Fish & Game
Central Coast Region 3
P. O. Box 47
Yountville, CA 94599

Warden Nicole Kozicki
P. O. Box 284
Moraga, CA 94556

SUBJECT: Section 1603 Notification for Davidon Homes Property Located in Southeast Antioch, Contra Costa County

Dear Nicole and Department Staff:

Attached please find a completed Notification of Lake or Streambed Alteration form and Project Questionnaire involving a very small portion of the Davidon Homes property located immediately east of the intersection of Canada Valley Road and Vista Grande in southeast Antioch. These forms supplement the detailed information previously forwarded to the USACE for wetland delineation verification and determination of non-jurisdiction.

The attached CDFG forms have been tentatively completed, pursuant to my earlier discussions with Nicole. At issue is the planned removal of a temporary swale, measuring 0.17 acres in area, which currently conveys storm drainage from Canada Valley Road to East Antioch Creek. As detailed in the attached October 8, 2002 letter to the USACE, the swale was constructed approximately 3 years ago to carry City storm drainage across the southwest corner of my client's property. Pursuant to an agreement with the City of Antioch, water will no longer discharge into the swale beginning next year when Canada Valley Road is extended south to connect with Lone Tree Way (see maps included in USACE package). Davidon Homes plans to concurrently develop the southwest corner of their 150-acre parcel where the swale is now located, in accordance with the City's adopted East Lone Tree Specific Plan and project-level EIR.

As detailed in the report from biologist Michael Wood (included in the attached USACE package), the swale currently satisfies vegetation, soils and hydrology criteria to classify it as an isolated wetland. However, as Canada Valley Road is completed to the south, the continued discharge of storm water will be eliminated, thereby allowing the swale area to revert to its historical dry condition. Based on these facts and the materials included in the USACE submittal, I do not believe the removal of this 0.17-acre artificial swale would "substantially divert or obstruct the natural flow or substantially change the bed, channel or bank of any river, stream or lake designated by the department" as regulated under Section 1603(a) of the Fish and Game Code.

As noted in the attached documentation, no special status plants or animals have been identified on this site or in the vicinity of this site. The City's previous EIR also failed to identify any sensitive biological resources within this area. In addition, a number of focused biological surveys recently completed in cooperation with your department, as part of the nearby East Antioch Creek Channel relocation project (CDFG Agreement #2000-573), also confirmed the absence of special resources.

I have completed the attached forms for your review and formal determination. Should you concur that work within this swale area does not warrant the issuance of a Section 1603(g) Agreement, please provide me with your written verification. Alternatively, if you have further questions, or if you would like to arrange to meet at the site, please call me as soon as possible. Thank you in advance for your review of the attached documentation.

Sincerely,

Richard T. Loewke, AICP

COPY: Mr. Jeff Thayer
Davidon Homes
1600 South Main Street #150
Walnut Creek, CA 94596

For Department Use Only					
Notification Number:		Date Received:		Date Completed:	
Fees Enclosed?	Yes $		No		
Action Taken/Notes:					

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF FISH AND GAME

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

(*See attachment/enclosure for instructions*)

Notification Type		
☐ 1601 (Public)	☐ Timber Harvest Plan	(No. ____)
☒ 1603 (Private)	☐ Commercial Gravel Extraction	(No. ____)
	☐ Water Application	(No. ____)

Applicant Information	Name	Address	Telephone/FAX
Applicant:	Richard T. Loewke, AICP	55 Oak Trail Ct. Alamo, CA 94507	Business: (925) 831-8016 Fax: (Phone + FAX)
Operator:	JEFF Thayer Davidon Homes	1600 South Main St Walnut Creek, CA 94596	Business: (925) 945-8000 Fax: (925) 256-0140
Contractor: (if known)			Business: Fax:
Contact Person: (If not applicant)			Business: Fax:
Property Owner:	Davidon Homes	1600 South Main St. Walnut Creek, CA 94596	Business: (925) 945-8000 Fax: (925) 256-0140

Project Location					
Location Description:	Immediately east of intersection of Canada Valley Road and Vista Grande in southeast Antioch (See attached maps).				
County			Assessor's Parcel Number		
Contra Costa			053-060-008		
USGS Map	Township	Range	Section	Latitude/Longitude	
	2N	2E	34 (SW 1/4 Section)		
Name of River, Stream, or Lake:	N/A				
Tributary To?	N/A				

Form FG2023

(Revised 11/18/99)

NOTIFICATION OF LAKE OR STREAMBED ALTERATION
(Continued)

Name of Applicant: Richard T. Loewke, AICP

Project Description							
Project Name:	Davidon Homes Property Swale / Southeast Antioch						
Proposed Start Date:	Nov '02	Proposed Completion Date:	Nov '02	Project Cost:	$ 1,000+	Number of Stream Encroachments: (Timber Harvest Plans only)	

Describe project below: *(Attach separate pages if necessary)*

Please review letter to CDFG dated 10/30/02 and Oct 8, 2002 Submittal for wetland delineation to USACE. Project involves removal of small (0.17-acre) swale which currently conveys City storm drain discharge from Canada Valley Road. Swale is plastic-lined surface created 3+ yrs. ago under agreement between property owners and City of Antioch.

☒ Continued on separate page(s)

Attachments/Enclosures

Attach or enclose the *required* documents listed below and check the corresponding boxes.

☒ Project description	☒ Map showing project location, including distances and/or directions from nearest city or town	☐ Construction plans and drawings pertaining to the project

Attach or enclose the documents listed below, if complete, and check the corresponding boxes.

Completed CEQA documents:	☐ Negative Declaration ☐ Mitigated Negative Declaration ☒ Environmental Impact Report ☐ Notice of Exemption ☐ Notice of Determination
Copies of applicable local, State, or federal permits, agreements, or other authorizations:	☒ Local. *Describe:* City Specific Plan for East Line Tree Area
	☐ State. *Describe:*
	☒ Federal. *Describe:* Pending Verification of Wetlands / Non Jurisdiction from ACOE.

I hereby certify that all information contained in this notification is true and correct and that I am authorized to sign this document. I understand that in the event this information is found to be untrue or incorrect, I may be subject to civil or criminal prosecution and the Department may consider this notification to be incomplete and/or cancel any Lake or Streambed Alteration Agreement issued pursuant to this notification. I understand that this notification is valid only for the project described herein and that I may be subject to civil or criminal prosecution for undertaking a project that differs from the one described herein, unless I have notified the Department of that project in accordance with section 1601 or 1603 of the Fish and Game Code.

I understand that a Department representative may need to inspect the property where the project described herein will take place before issuing a Lake or Streambed Alteration Agreement pursuant to this notification. In the event the Department determines that a site inspection is necessary, I hereby authorize the Department to enter the property where the project described herein will take place to inspect the property at any reasonable time and certify that I am authorized to grant the Department permission to access the property.

☐ *I request the Department to first contact me at (insert telephone number) ______________________ to schedule a date and time to enter the property where the project described herein will take place and understand that this may delay the Department's evaluation of the project described herein.*

[signature] Operator or Operator's Representative

10/30/02 Date

Lake and Streambed Alteration Program
Project Questionnaire

Please complete the following questionnaire and submit it with your notification package to expedite the Department's review of your proposed project or activity. ***Please attach or enclose any additional information or documents that support or relate to your response.***

	Yes	Maybe/ Uncertain	No	Please explain if you responded "yes" or "maybe/uncertain"
1. Will the project or activity involve work on the bank of a river, stream, or lake?			X	Affected area is a very shallow man-made swale which has an underlying plastic liner.
2. If you answered "yes" to #1, will the project or activity involve any of the following: N/A				
a. Removal of any vegetation?				
b. Excavation of the bank?				
c. Placement of piers?				
d. Placement of bank protection or stabilization structures or materials (e.g., gabions, rip-rap, concrete slurry/sacks)?				
3. Will the project or activity take place in, adjacent to, or near a river that has been designated as "wild and scenic" under state or federal law?			X	Nearest water course is the East Antioch Creek Flood Control Channel (CDFG Agreement #2000-573)
4. Will the project or activity involve work in the bed or channel of a river, stream, or lake?			X	
5. Will the project or activity involve the placement of any permanent or temporary structure in a river, stream, or lake?			X	

	Yes	Maybe/ Uncertain	No	Please explain if you responded "yes" or "maybe/uncertain"
6. Will the project involve the use of material from a streambed?			X	
7. Will the project or activity result in the disposal or deposition of debris, waste, or other material in a river, stream, or lake?			X	
a. If you answered "yes" to #7, describe the material that will be disposed of or deposited in the river stream, or, lake:	N/A			
8. Will any type of equipment be used in a river, stream, or lake?			X	
a. If you answered "yes" to #8, describe the type of equipment that will be used:	N/A			
9. Does the project or activity area flood or periodically become inundated with water?	X			This site currently carries storm drainage discharge from pipe in Canada Valley Road for a distance of ±450'. This discharge will end when roadway is extended.
10. Will water need to be diverted from a river, stream, or lake for the project or activity?			X	
11. If you answered "yes" to #10, please answer the following: N/A				
a. Will this be a temporary diversion?				
b. Will water quality be affected by the deposition of silt, an increase in water temperature, a change in the pH level, or in some other way?				
c. Will the water be diverted by means of a dam, reservoir, or other water impoundment structure?				
12. Will the project or activity be done pursuant to a water right application or permit?			X	
13. a. Has a wildlife assessment or study been completed for the area where or near where the project or activity will take place? (If "yes", attach or enclose a copy of the assessment or study.)	X			Completed as part of EIR for Antioch's East Lone Tree Planning Area. See Attached Documentation. No Special Status plants or animals identified (See letter).

	Yes	Maybe/ Uncertain	No	Please explain if you responded "yes" or "maybe/uncertain"
14. Will the project or activity affect fish, amphibians, insects, or other aquatic resources?			X	No evidence of any special status plants, or animals pursuant to project level EIR.
15. Will the project or activity affect terrestrial wildlife?			X	This small scale (0.17 acre) is maintained periodically (By vegetation removal) and is temporary in nature (3 yrs old)
16. Are any endangered or rare plant species thought or known to occur in the area where the proposed project or activity will take place?			X	See 13, 14 & 15 above
17. Are any endangered or threatened fish, bird, or animal species thought or known to occur in the area where the proposed project or activity will take place?			X	" "
18. Have you contacted any other local, State, or federal agency regarding the project or activity?	X			A wetland delineation was completed and filed with the USACE on 10/8/02.
a. If you answered "yes" to #18, please list the names of the agencies you have contacted:	A copy of the request for verification and non-jurisdictional determination is attached.			
19. Have you applied for or obtained any permit, agreement, or other authorization for your project or activity from any government agency?	X			A specific plan and project-level EIR were approved by the City of Antioch in
a. If you answered "yes" to #19, please list the names or describe the permit, agreement, or authorization you have applied for or obtained:	1996, followed by adoption of a Utility Service Financial Plan in 1998.			
20. Have any environmental documents pertaining to your project or activity been prepared?	X			See #19 above.
a. If you answered "yes" to #20, please list the environmental documents that have been prepared:				

I hereby certify that all information contained in this notification is true and correct and that i am authorized to sign this document. I understand that in the event this information is found to be untrue or incorrect, I may be subject to civil or criminal prosecution and the Department may consider this notification to be incomplete and/or cancel any Lake or Streambed Alteration Agreement Issued pursuant to this notification.

Operator or Operator's Representative

10/30/02

Date

RICHARD T. LOEWKE, AICP
PLANNING CONSULTANT

October 8, 2002

Michael Finan
Chief, Delta Office
U.S. Army Corps of Engineers
1325 J Street
Sacramento, CA 95814-2922

SUBJECT: Request for Verification of Non-Jurisdictional Status of Swale Located on Property in Antioch, Contra Costa County

Dear Mr. Finan:

This request involves review of a draft wetland delineation report recently completed for a very small (0.17-acre) isolated area located immediately adjacent to the intersection of Canada Valley Road and Vista Grande in southeastern Antioch. The site is located in Section 34, Township 2 North, Range 2 East, MDBM, Antioch, Contra Costa County. Attached to this cover letter are the following documents for your further review:

1. Regional Location Map.
2. Map of Southeast Antioch showing location of East Lone Tree Planning Area.
3. Map of East Lone Tree Planning Area showing delineation area and recent USACE non-jurisdiction determination areas as discussed below.
4. September 13, 2002 Wetland Delineation Report by Michael Wood, Biologist.
5. USACE Determination Letter of 10/16/01 for Lindsey Basin (#200100337).
6. USACE Determination Letter of 4/25/00 for East Antioch Channel (#200000110).
7. Excerpts from East Lone Tree Specific Plan project EIR, certified by the City of Antioch.

Your office has twice recently been involved in the review and verification of wetland delineations for adjoining properties, located north of Lone Tree Way and West of Empire Avenue in the City of Antioch. In both of the above referenced cases, representatives of your office met in the field with my team of planners and biologists. In both cases, your office determined that jurisdictional waters of the U.S. were not present.

The subject property is a very small and isolated temporary drainage swale, located immediately to the east of the intersection of Canada Valley Road and Vista Grande in southeast Antioch. The swale was originally created approximately 3 years ago (subject to a drainage release to the City of Antioch), as a plastic-lined discharge course to carry storm water from a temporary 48" RCP outlet on the east side of Canada Valley Road.

Cattle grazing has been responsible for the demise of the original plastic liner, allowing cattails and other non-native vegetation to periodically grow within the saturated soils on the swale. The property owner has, however, made various subdrain and rock lining improvements to the swale, and has consistently bladed the surface of the swale since its liner deteriorated. As discussed in the report from Mr. Wood, however, cattails and other non-native vegetation continue to emerge from the saturated soils within this 0.17-acre swale.

55 Oak Trail Court • Alamo, CA 94507-2502 • Phone & Fax 925.831.8016

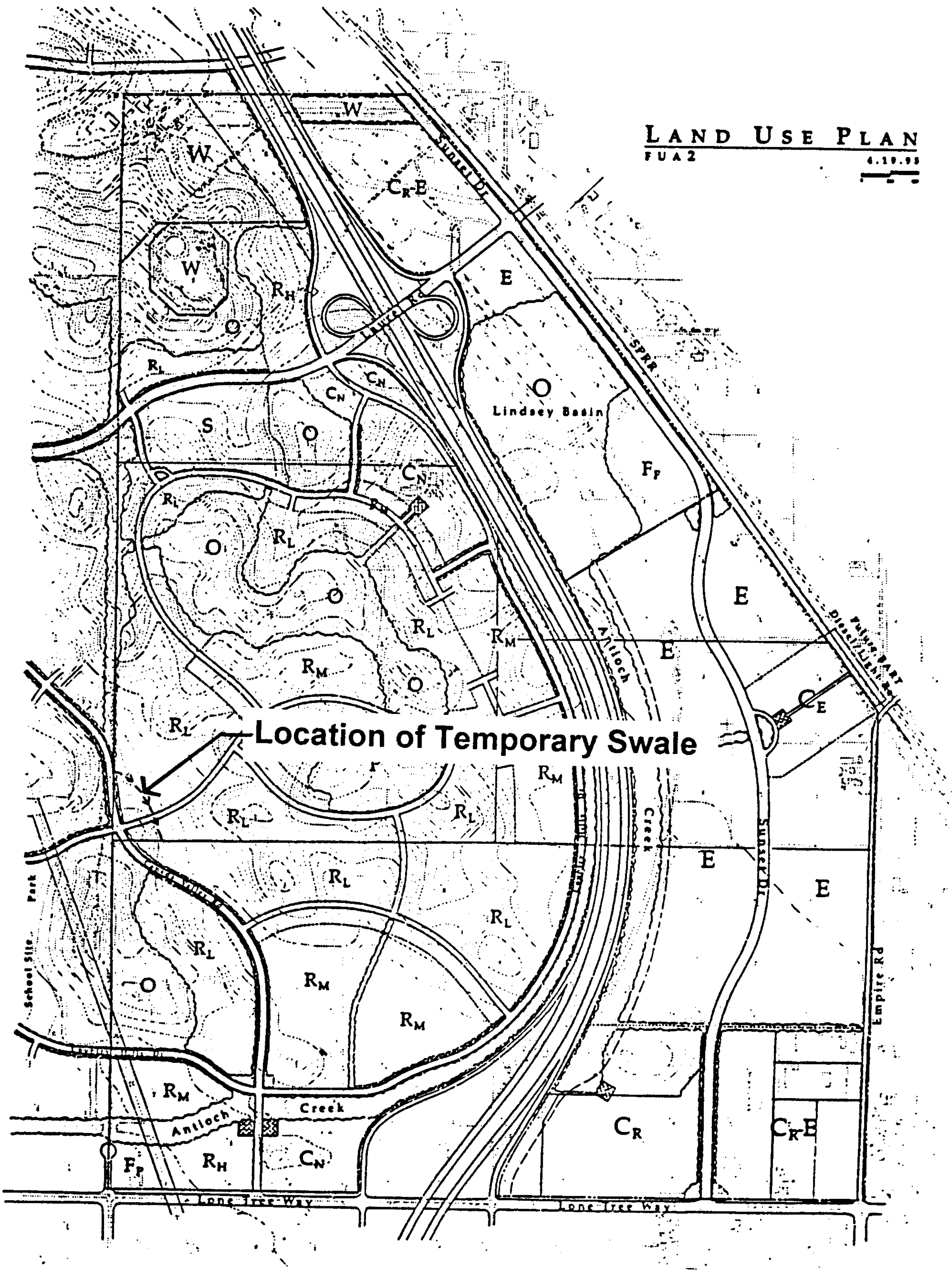
The City of Antioch is planning to extend Canada Valley Road south to connect with Lone Tree Way in the next several months, as called for in the specific plan. Once complete, this improvement will extend the 48" storm drain trunk line which currently discharges onto the subject property. Completion of the trunk line will remove all water from the swale, thereby eliminating the need for the swale.

As a condition of subdivision approval (called out in the City's project EIR as a verification requirement), the property owner, Davidon Homes, is obligated to obtain verification of non-jurisdiction from the Corps. We therefore request that you review this documentation and issue a written determination with respect to jurisdiction. If I can be of assistance in answering any questions, or if your staff would like to arrange a meeting in the field, please do not hesitate to call me at 9925) 831-8016 (or via e-mail at LoewkeAICP@cs.com).

Sincerely,

Richard T. Loewke, AICP

Cc: Jeff Thayer, Davidon Homes
Nicole Kozicki, CDFG
Mike Wood, Biological Consulting



Adopted 1996 City of Antioch
East Lone Tree Specific Plan

Adopted Specific Plan EIR
Mitigation Measures

b. Mitigation Measures

The following mitigation measure is hereby adopted and will be implemented as provided in the Mitigation Monitoring Program:

I5. Development applicants shall coordinate with the pipeline and irrigation companies and appropriate Health an Safety Agencies with regard to the design, timing, access and easement requirements related to respective utility relocation.

c. Findings

Based on the Final Environmental Impact Report (FEIR) and the entire record before this City Council, this City Council finds that:

i. The adoption of mitigation measure I5 would reduce the potential of infrastructure-related impacts to a less-than significant level.

Vegetation and Wildlife

Impact J1: Wetland habitats within the planning area would be lost or periodically modified by development envisioned by the proposed plan.

a. Description

This Project Impact is discussed on Page 144 of the Draft Environmental Impact Report (DEIR).

b. Mitigation Measures

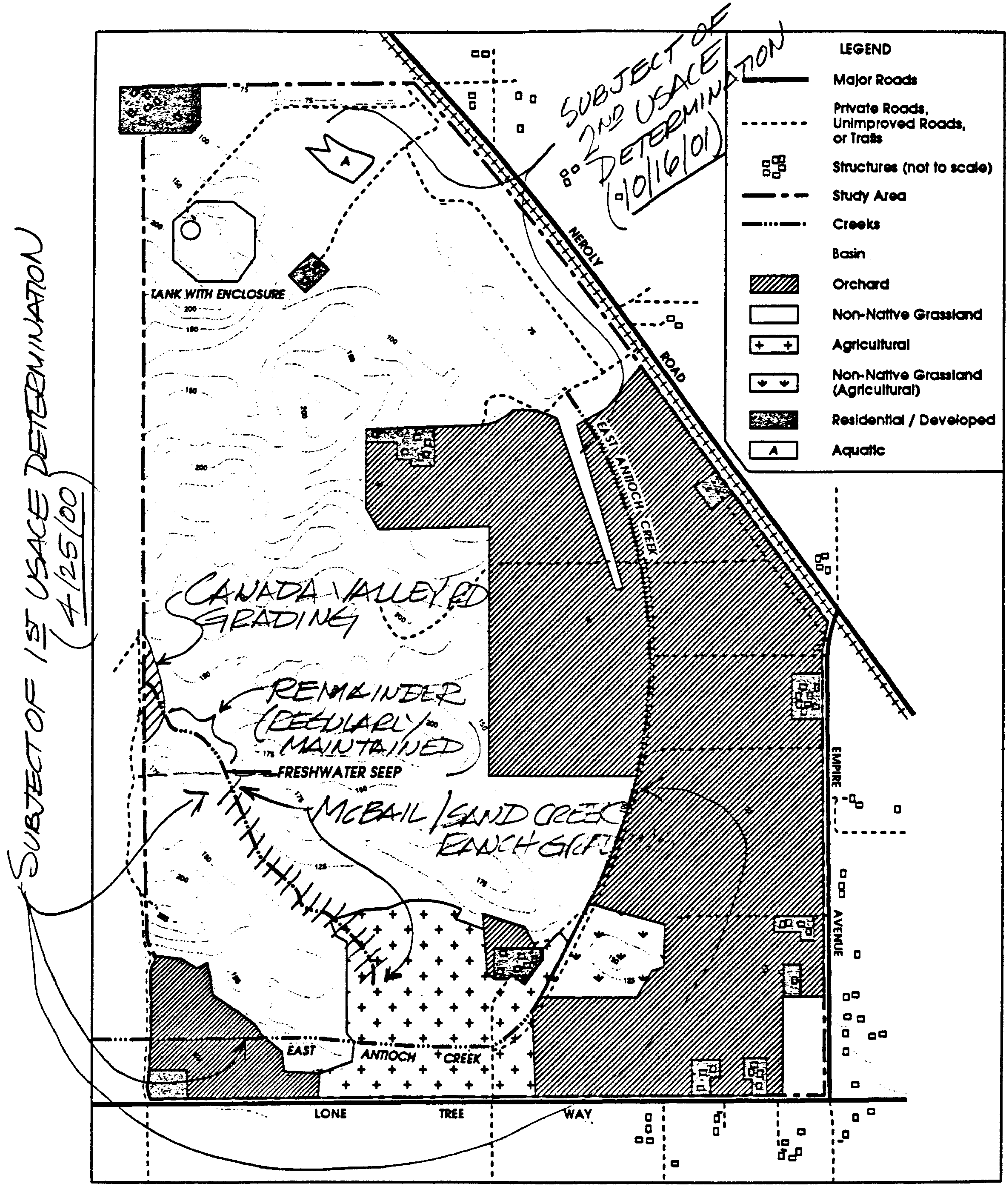
The following mitigation measure is hereby adopted and will be implemented as provided in the Mitigation Monitoring Program:

J1. The developer of any subsequent project(s) shall be required to have a formal wetland delineation undertaken and verified by the Army Corps of Engineers. Based on the findings of that delineation, the developer may be required to have a wetland replacement plan prepared by a biologist qualified to prepare such plans, and shall commit to its implementation in a manner, and on a schedule, acceptable to the Corps and to the City of Antioch.

c. Findings

Based on the Final Environmental Impact Report (FEIR) and the entire record before this City Council, this City Council finds that:

i. The adoption of mitigation measure J1 would reduce the potential of vegetation and wildlife-related impacts to a less-than significant level.



Source: H. T. Harvey & Associates

Figure 30

Biotic Habitats

0 500 1000 2000

Michael K. Wood
Biological Consulting
65 Alta Hill Way
Walnut Creek, CA 94595
Tel: (925) 899-1282
Fax: (925) 939-4026
e-mail: wood-biological@mindspring.com

September 13, 2002

Dick Loewke
55 Oak Trail Ct.
Alamo, CA 94507

Re: Wetland Delineation, Southwest Corner of Rolling Hills Ranch

Dear Dick:

At your request, I have completed a preliminary jurisdictional determination of the western portion of the Rolling Hills Ranch site. The study area is located near the intersection of Canada Valley Road and Vista Grande Drive in eastern Antioch (Figure 1). The study area was restricted to the rock-lined drainage channel situated just east of Canada Valley Road and drains roughly from north to south, and exiting onto the McBail property.

METHODS

A routine wetlands delineation and preliminary jurisdictional determination was performed by biologist Michael Wood on August 29, 2002. The survey was conducted in accordance with the procedures outlined in the U.S. Army Corps of Engineers' (USACE) Wetlands Delineation Manual (Environmental Laboratory 1987). Based on topography and the presence or absence of field indicators including vegetation, hydrology and soils, the limits of potential jurisdictional waters of the U.S. was determined. The extent of potential wetlands and waters of the U.S. was mapped on a 1" = 50'scale topographic map (enclosed).

Documentation reviewed as part of this analysis includes *Draft Environmental Impact Report, Future Urbanization Area #2 Specific Plan, Antioch, California* (Mundie & Associates 1995), *Biological Constraints Analysis for East Antioch Creek Corridor through the McBail Property, Contra Costa County, California* (Sycamore Associates 2000), *Wetland Delineation and Preliminary Jurisdictional Determination for the Lindsey Basin Expansion Project* (Michael Wood Biological Consulting 2001), and jurisdictional determination letters for the East Antioch Creek Flood Control Channel and Lindsey Basin Expansion Project (USACE 2000, 2001, respectively).

SETTING AND SITE DESCRIPTION

The study area is situated in an open field adjacent to recent residential subdivision development (Figure 2). Lands to the west have been graded and filled to accommodate the southward extension of Canada Valley Road. The Jacuzzi property has been used historically for the grazing of cattle. Cattle have been recently excluded from the study area by construction of a barbed-wire fence. Vegetation on the Jacuzzi property and surrounding, undeveloped lands is characteristic of eastern Contra Costa County, consisting predominantly of non-native annual grassland. Topography of the site consists of low, rolling hills.

The focus of this effort is a recently evolved drainage channel at the western edge of the Jacuzzi property. A temporary 48" reinforced concrete pipe (RCP) outfall leads onto the Jacuzzi property, conveying storm water from beneath Canada Valley Road. The outfall is situated near the northern, or upstream, end of the drainage channel. The outfall is due to be closed as the roadway is extended to the south later this year.

Vegetation

The Jacuzzi property is dominated by non-native annual grassland. Non-native annual grassland is typically of heavily grazed areas. Characteristic non-native species detected on site include ripgut brome (*Bromus diandrus*), wild oats (*Avena fatua*), Italian ryegrass (*Lolium multiflorum*), bur-clover (*Medicago polymorpha*), yellow star thistle (*Centaurea solstitialis*), bristly ox-tongue (*Picris echioides*), field bindweed (*Convolvulus arvensis*), curly dock (*Rumex crispus*), and filaree (*Erodium* spp.), among others.

Vegetation within the channel consists of a more or less continuous band of freshwater marsh vegetation that has recently evolved on the site. The dominant species is cattails (*Typha latifolia* and *T. angustifolia*). Also present in the channel are three-square (*Scirpus americanus*), toad rush (*Juncus bufonius*), northern willow herb (*Epilobium ciliatum*), water speedwell (*Veronica anagallis-aquatica*), umbrella sedge (*Cyperus eragrostis*), and loosestrife (*Lythrum hyssopifolia*). A single sapling of red willow (*Salix laevigata*) is also present. Vegetation on the slopes leading to the channel is ruderal, and dominated by bristly ox-tongue.

No woody vegetation is present within the study area or its vicinity.

Non-native annual grassland to the California annual grassland series as described in Sawyer and Keeler-Wolf (1995), and would be classified as an upland habitat following Cowardin, *et al.* (1979). Freshwater marsh conforms to the cattail series as described in Sawyer and Keeler-Wolf (1995) and would be classified as a palustrine persistent emergent freshwater wetland following Cowardin, *et al.* (1979).

Soils

Soils within the study area are mapped as Diablo clay, 9-15 percent slopes (USDA 1977). The Diablo series consists of well-drained soils underlain by calcareous, soft, fine-grained sandstone and shale. These soils are on uplands with slopes ranging from 9 to 50 percent and at elevations from 400 to 1,200 feet above mean sea level. The average annual temperature is

59° F, average annual rainfall is 12-25 inches, and the average frost-free period is 260-300 days per year. The soils are generally moist to a depth of 30 inches from November to May and are dry from June to mid-October in most years. The natural vegetation consists primarily of annual grasses and forbs with a few scattered oaks.

The specific mapping unit occurring onsite, Diablo clay, 9 to 15 percent slopes, has slow permeability in the subsoil, run-off is slow to medium and the hazard of erosion is slight to moderate where the soil is bare. No water table was within the depth of observation, usually five feet (USDA 1977). The presence of this soil type was confirmed in the field The Diablo series is classified as a Chromic Pelloxerert. Included in this soil unit are areas of Cropley clay and Altamont clay. Diablo clay, 9 to 15 percent slopes is not considered a hydric soil type (USDA 1991, 1992).

Hydrology

The focus of the present study is an unnamed drainage channel located at the western edge of the property. The drainage channel contained a small amount of standing water at the time of the present survey, and soils beneath the surface were moist to the touch. The channel is presumed to be ephemeral in nature.

The drainage channel is not part of a natural creek. It does not appear in aerial photos prior to 1970 and is believed to have evolved following construction of the adjacent residential development. Around 1990, a storm water detention basin was constructed on adjacent land immediately upslope of the study area (D. Loewke, pers. comm.) The basin discharged onto the Jacuzzi property. Surface flows drained overland onto the McBail property before disappearing underground. The basin was removed in 1998. As part of the construction of the adjacent residential subdivision and the extension of Canada Valley Road, a 48" storm drain outfall was constructed at the western boundary of the Jacuzzi property. The outfall empties into the drainage channel, near its northern, or upstream end. Interestingly, freshwater marsh vegetation extends approximately 60 feet upstream of the outfall, indicating that it might not be the sole source of water. However, there is no evidence of surface water leading to the upstream end of the cattail habitat.

The drainage channel itself covers approximately 450 linear feet and varies in width (at the tops of bank) from 5-15 feet. It is shallowly to barely incised, ranging in depth from 0.5-1.5 feet. The channel has developed as a result of periodic maintenance, which has occurred over the past four years (since the detention basin was removed.) Beneath the channel, two perforated drainpipes were installed over a plastic liner, and covered with rock. The plastic liner appears to have deteriorated. Three 36" diameter corrugated steel pipes (CSP) are installed near the middle of the channel to accommodate vehicle access onto the property.

The channel exists the property at the McBail Ranch, where it meanders and ultimately dissipates into the ground. Sheet flow from the surrounding lands ultimately reach East Antioch Creek. East Antioch Creek is an artificial flood control channel draining the Lone Tree Valley. Storm flows are directed into the Lindsey Basin, an artificial flood control basin built around 1994 by the Contra Costa County Flood Control District.

RESULTS

Based on an evaluation of the existing conditions within the study area, vegetation within the drainage channel appears to meet the federal definition of a wetland (see below). A total of 7,575 square feet of wetland habitat (emergent freshwater marsh) is currently present within the study area.

Based on review of historical aerial photographs and interviews with persons familiar with the history of the site, the existing wetland is believed to have only recently developed due presumably to man-caused alterations of the surface hydrology. However, even though the presumed original source of water causing the development of this wetland, the storm water detention basin, was removed around 1998, the habitat has persisted. It can therefore be presumed that the freshwater marsh will continue to persist, therefore representing a "new existing condition." As such, impacts to this habitat may be regulated by several agencies (see discussion, below.)

PERMITTING IMPLICATIONS

Because the drainage channel is not connected to a natural watercourse and is isolated, it is believed to fall outside of the jurisdiction of the USACE. In 2001, the Supreme Court ruled that the U.S. Army Corps of Engineers (USACE) cannot evoke the Commerce Clause (migratory bird rule) in claiming jurisdiction over isolated wetlands (Solid Waste Agency of Northern Cook County [SWANCC] v. USACE). Based on our experience, we do not believe that impacts to the isolated wetlands on site would be regulated under Section 404 of the Clean Water Act. This is supported by recent determination made by the USACE-Sacramento District that the agency does not have jurisdiction over the nearby East Antioch Creek (2000) or the Lindsey Basin (2001). Nonetheless, the USACE should be contacted to make a formal jurisdictional determination.

Irrespective of federal jurisdiction, impacts to wetlands, including isolated wetlands, are regulated pursuant to state law. Specifically, Section 1600 *et seq.* and the Porter-Cologne Act provide authority for the California Department of Fish and Game (CDFG), the State Water Resources Control Board (SWRB), and the Regional Water Quality Control Board (RWQCB) to regulate impacts to wetlands and waters of the state.

Some general background information regarding wetlands and the agencies involved in their regulation is provided below.

<u>U.S. Army Corps of Engineers</u>

Section 404 of the Clean Water Act (CWA) of 1972 regulates activities that result in the discharge of dredged or fill material into waters of the U.S., including wetlands. The primary intent of the CWA is to authorize the U.S. Environmental Protection Agency (EPA) to regulate water quality through the restriction of pollution discharges. The USACE has the principal authority to regulate discharges of dredged or fill material into waters of the U.S.

Waters of the U.S. are defined as 1) waters used in interstate or foreign commerce, 2) waters subject to the ebb and flow of tide, 3) all interstate waters including interstate wetlands, intrastate lakes, rivers, streams, mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce, and 4) areas that are or could be used for recreation by interstate or foreign travelers, fish or shellfish that is sold in interstate or foreign commerce, or industrial purposes in interstate commerce. The Environmental Protection Agency (EPA) has expanded the definition of "waters" to include waters used to irrigate crops sold in interstate commerce, and habitats that are used by birds protected by treaty or birds that cross state lines, and habitat for endangered species (51 FR 41217), as well as impoundments of "waters", tributaries of "waters", and territorial seas (§328.3(a)(4),(5),(6).

Wetlands, a subset of waters of the U.S., are defined as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (§404 Clean Water Act). Indicators of all three wetlands parameters (hydric soils, hydrophytic vegetation, wetlands hydrology) must be present for a site to be classified as a wetland (Environmental Laboratory 1987).

Projects that result in impacts of less than one-half acre (or one-third acre for certain transportation projects) and/or less than 300 linear feet (or 200 linear feet for certain transportation projects) may be authorized under one of the existing USACE Nationwide Permits (NWPs) if they meet all of the Nationwide Permit General Conditions. If the project falls under the NWP program and will result in greater than 0.10 acre of impacts, a pre-construction notification (PCN) must be submitted to the USACE prior to discharging fill. The NWP General Conditions require that the project include provisions for the protection of federally- or state-listed Endangered or Threatened species, water quality management and construction practices that do not disrupt movement of aquatic life, among other requirements. Additional regional requirements for maintaining upland buffer areas between authorized projects and open waters or streams may be conditions for granting any USACE permit. Therefore, activities authorized under NWPs are often those projects that have minimal impacts to wetlands, waters and special-status species. If no state- or federally-listed Endangered or Threatened species have the potential to occur in the project area, processing of NWPs frequently takes 30 to 60 days. When listed species may be present in the project area, the review and negotiation process may take up to six months or more.

California Department of Fish and Game

The CDFG exercises jurisdiction over wetland and riparian resources associated with rivers, streams, and lakes under California Fish and Game Code Sections 1600 to 1607. The CDFG has the authority to regulate work that will substantially divert, obstruct, or change the natural flow of a river, stream, or lake; substantially change the bed, channel, or bank of a river, stream, or lake; or use material from a streambed. California Department of Fish and Game's jurisdictional area along a river, stream or creek is usually bounded by the top-of-bank or the outermost edges of riparian vegetation. Typical activities regulated by CDFG under Sections 1600-1607 authority include installing outfalls, stabilizing banks, implementing flood control projects, construction river and stream crossings, diverting water, damming streams, gravel mining, and logging operations.

Prior to undertaking any activity that will impact any of the above biological resources, a Streambed Alteration Permit must be obtained from CDFG. An application for a Streambed Alteration Permit usually requires a complete project description, a biological assessment of the project site, analyses of direct, indirect and cumulative impacts, a technically-defensible biological mitigation and monitoring plan, a documented history of project alternatives and efforts to avoid and minimize impacts, a relevant California Environmental Quality Act (CEQA) document, and a Notice of Determination that demonstrates the project has complied with CEQA. The CDFG has authority to reopen CEQA if impacts to resources over which it has jurisdiction have not been adequately addressed.

Regional Water Quality Control Board

Pursuant to Section 401 of the Clean Water Act and EPA 404(b)(1) Guidelines, an applicant for a federal permit to conduct any activity which may result in discharge into navigable waters must provide a certification from the Regional Water Quality Control Board (RWQCB) that such discharge will comply with the state water quality standards (Cal. Code Regs. tit. 23, §§3830 *et seq.*). The RWQCB has a policy of no net loss of wetlands in effect and typically requires mitigation for all impacts to wetlands before it will issue a water quality certification or waiver thereof.

Under the Porter-Cologne Water Quality Control Act (Cal. Water Code §§13000-14920), the RWQCB is authorized to regulate the discharge of waste that could affect the quality of the State's waters. "Waste" is broadly defined by the Porter-Cologne Act to include "sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation of whatever nature…." (Cal. Water Code §13050). Concentrated silt or sediment associated with human habitation and harmful to the aquatic environment is "waste" under this section. In addition, the California Attorney General has interpreted this definition to include extraction of sand, gravel or other minerals from a streambed, because it may cause an increase in turbidity and silt in the waters of the stream downstream from the operations. Therefore, even if a project does not require a federal permit (*i.e.*, a Nationwide Permit for the USACE), it may require review and approval of the RWQCB.

When reviewing applications, the RWQCB focuses on ensuring that projects do not adversely affect the "beneficial uses" associated with waters of the state. Generally, the RWQCB defines beneficial uses to include all of the resources, services and qualities of aquatic ecosystems and underground aquifers that benefit the state of California. Numerous beneficial uses have been identified, including agricultural supply, wildlife habitat, recreation, groundwater recharge, and municipal and domestic water supply. In most cases, the RWQCB seeks to protect these beneficial uses by requiring the integration water quality control measures into projects that will result in discharge into waters of the state. For most construction projects, RWQCB requires the use of construction and post-construction Best Management Practices (BMPs). In many cases, proper use of BMPs, including detention ponds, grassy swales, sand filters, modified roof drains, and other features, will speed project approval from RWQCB. Development setbacks from creek are also favored by RWQCB as they often lead to less creek-related impacts in the future. Proper integration of these and other features into project design will greatly decrease the necessary negotiation with RWQCB and speed the project approval process.

I hope this information allows you to move forward with your planning. If you have any questions, please don't hesitate to contact me.

Sincerely,

Michael Wood

Michael Wood

Enclosures: Literature Cited, Data Forms, Figure 1 (Project Location), Figure 2 (Aerial Photograph of Project Vicinity), Preliminary Jurisdictional Determination Map

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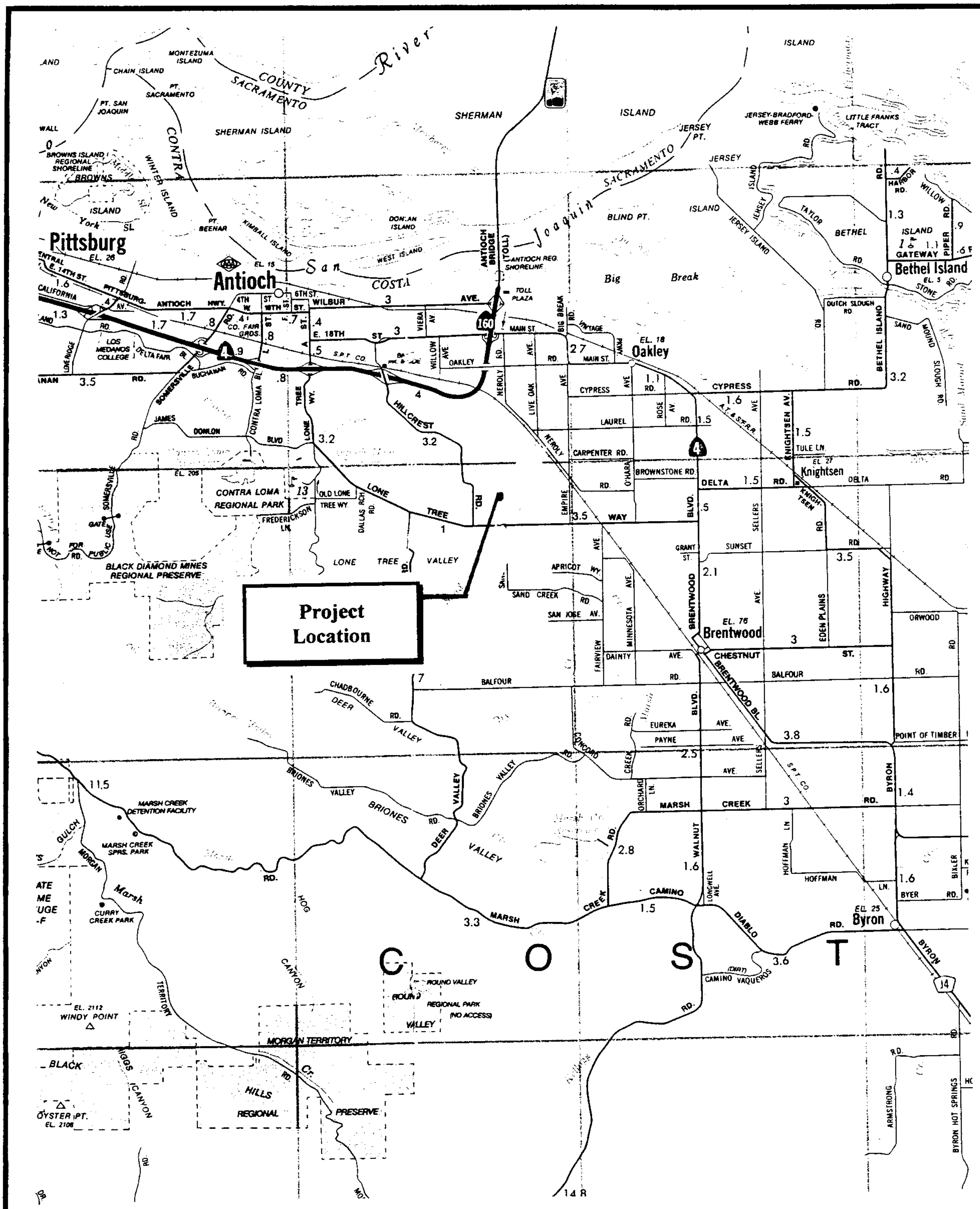


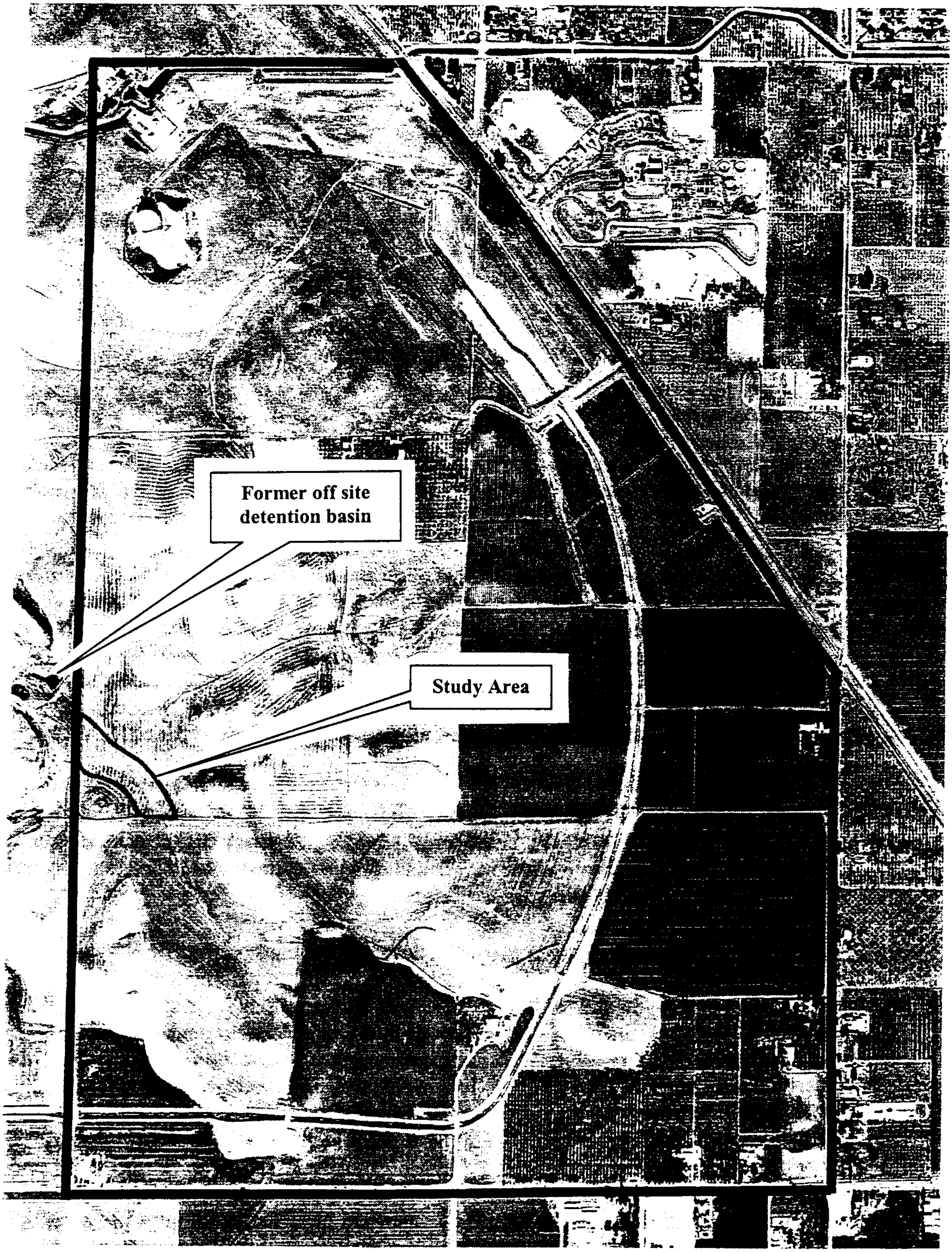
Source: California State Automobile Association

Figure 1. Project Location

Michael Wood Biological Consulting

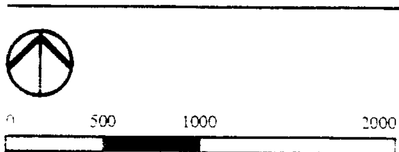
NORTH

Scale 1" = 2.5 miles



Source: Mundie & Associates 1995
date of photo: July 1990

FIGURE 2
AERIAL PHOTOGRAPH OF PROJECT VICINITY



DATA FORM
ROUTINE WETLAND DELINEATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Rolling Hills Ranch	Date:	8/29/02
Applicant/Owner	Jacuzzi	County:	Contra Costa
Investigator:	Michael Wood (925) 899-1282	State:	California

Community ID: freshwater marsh

Do normal circumstances exist on the site?	YES	
Is the site significantly disturbed (Atypical Situation)?	YES	Transect ID:
Is the area a potential Problem Area?	NO	Plot ID: Sample Point # 1

VEGETATION

Dominant Species Present[1]	% Cover[2]	Stratum	Indicator	Subdominant Species Present[3]	% Cover[2]	Stratum	Indicator
1. *Typha angustifolia*	30	herb	OBL	1. *Cyperus eragrostis*	15	herb	OBL
2. *Scirpus americanus*	20	herb	OBL	2. *Juncus bufonius*	8	herb	FACW+
3.				3. *Lythrum hyssopifolia*	5	herb	FACW
4.				4. *Picris echioides*	12	herb	FAC*
5.				5. *Veronica anagallis-aquatica*	3	herb	OBL
6.				6. *Polypogon monspeliensis*	8	herb	FACW+
7.				7.			
8.				8.			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 100%

Remarks: Site is clearly dominated by strong wetland indicator species. Vegetation compositions is clearly distinct from adjacent uplands. Vegetation is presumed to have recently evolved on site as a result of modified hydrologic conditions following grading for a nearby housing development.

[1]Dominance determined by the 50/20 Rule. [2]Estimated absolute cover. [3]Not considered for wetland determination.

HYDROLOGY

__ Recorded data (describe in remarks)
X No recorded data available

Field Observations:

Depth of surface water: 0 (inches)
Depth to free water in pit: >6 (inches)
Depth to saturated soil: >6 (inches)

Wetland Hydrology Indicators

Primary Indicators:

__ inundated
__ saturated in upper 12 inches
__ water marks
__ drift lines
x sediment deposits
x drainage pattern in wetlands

Secondary Indicators:

x oxidized root channels in upper 12 inches
__ water-stained leaves
__ local soil survey data
x FAC neutral test
x other (see below)

Remarks:
Sample point is near top of watershed. Urban flows from residential development obviously contribute to surface hydrology of site. A 48” RCP outfall is located near upstream end of site, and 3 36” CSP culverts channel survace flows beneath a dirt road downstream. Algal mats present, as are deep vertical cracks in the soil. Channel was recently constructed and lined with coarse drainage rock, making it impossible to dig a 12” deep soil pit. Surface flows are conveyed off site via an unlined, open ditch. Standing water was present at the time of the survey.

DATA FORM
ROUTINE WETLAND DELINEATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Rolling Hills Ranch	Date:	8/29/02
Applicant/Owner	Jacuzzi	County:	Contra Costa
Investigator:	Michael Wood (925) 899-1282	State:	California

Community ID: ruderal upland

Do normal circumstances exist on the site?	YES	
Is the site significantly disturbed (Atypical Situation)?	YES	Transect ID:
Is the area a potential Problem Area?	NO	Plot ID: Sample Point # 2

VEGETATION

Dominant Species Present[1]	% Cover[2]	Stratum	Indicator	Subdominant Species Present[3]	% Cover[2]	Stratum	Indicator
1. *Picris echioides*	80	herb	FAC*	1.			
2. *Lolium multiflorum*	30	herb	FAC*	2.			
3.				3.			
4.				4.			
5.				5.			
6.				6.			
7.				7.			
8.				8.			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 100%

Remarks: Site is dominated by very marginal wetland indicator species. Vegetation compositions is not very distinct from adjacent non-native grassland (upland), but clearly distinct from adjacent freshwater marsh.

[1]Dominance determined by the 50/20 Rule. [2]Estimated absolute cover. [3]Not considered for wetland determination.

HYDROLOGY

__ Recorded data (describe in remarks)
X No recorded data available

Field Observations:

Depth of surface water: 0 (inches)
Depth to free water in pit: >12 (inches)
Depth to saturated soil: >12 (inches)

Wetland Hydrology Indicators

Primary Indicators:

__ inundated
__ saturated in upper 12 inches
__ water marks
__ drift lines
__ sediment deposits
__ drainage pattern in wetlands

Secondary Indicators:

__ oxidized root channels in upper 12 inches
__ water-stained leaves
__ local soil survey data
__ FAC neutral test
__ other (see below)

Remarks:
No field indicators of wetland hydrology present.

**PRELIMINARY
WETLAND DELINEATION
AND JURISDICTIONAL DETERMINATION
FOR THE JACUZZI PROPERTY,
CONTRA COSTA COUNTY, CALIFONRIA**

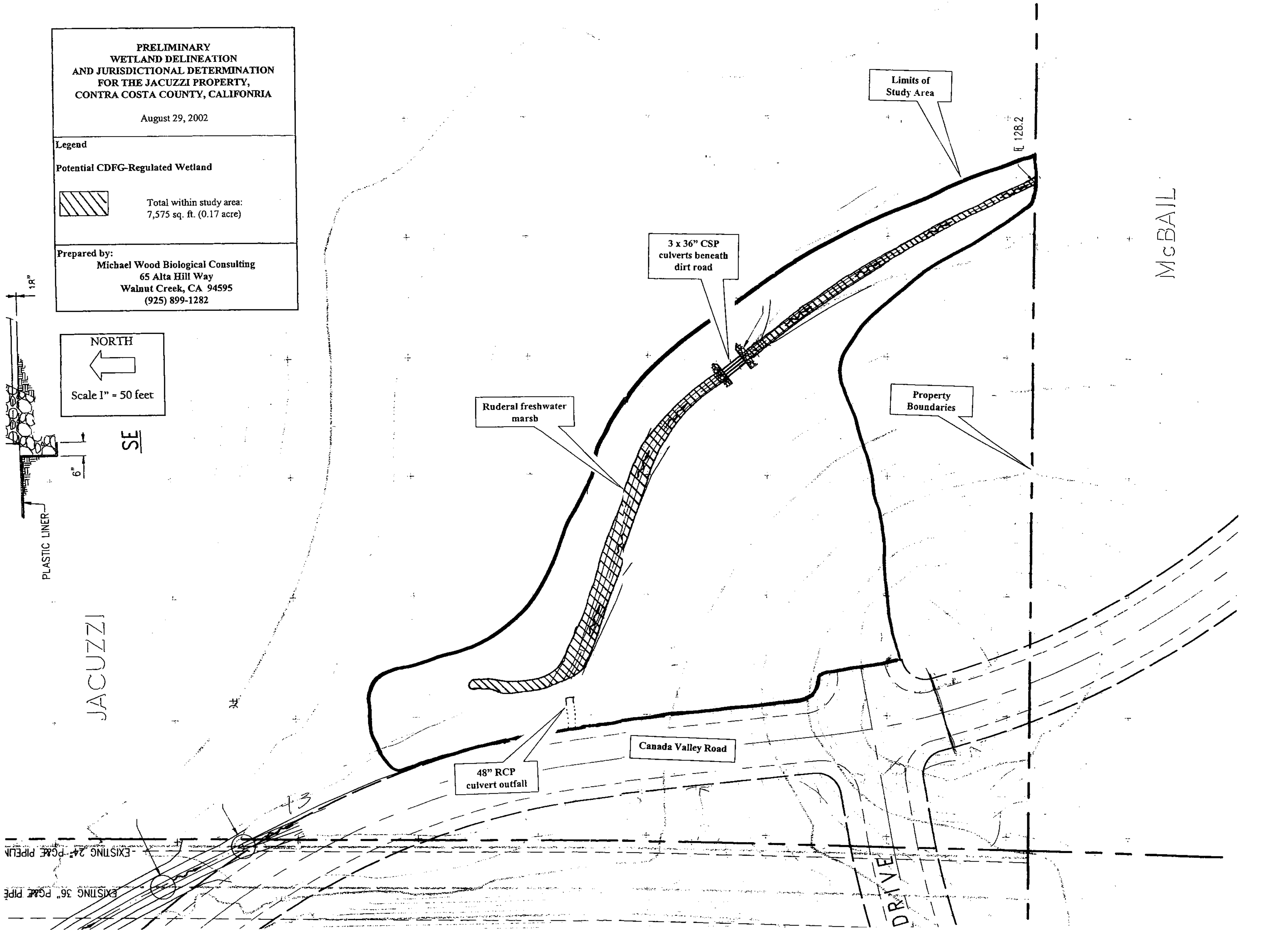
August 29, 2002

Legend

Potential CDFG-Regulated Wetland

Total within study area:
7,575 sq. ft. (0.17 acre)

Prepared by:
Michael Wood Biological Consulting
65 Alta Hill Way
Walnut Creek, CA 94595
(925) 899-1282



Appendix I

Future Urbanization Area #2 Specific Plan Mitigation Monitoring & Reporting Plan

CHAPTER II

MITIGATION MONITORING AND REPORTING

Mitigation Measure	Responsibility for Implementation	Responsibility for Monitoring	Action by Monitor	Compliance
TRANSPORTATION				
Intersection Improvements as described in the DEIR (Chapter III.B)	Developers of Specific Plan projects (shares to be determined at time of subsequent approvals)	City of Antioch, Community Development Department, Land Planning Services Division	Verify that appropriate contributions have been made by Specific Plan landowners	Requirement of Tentative Maps and/or Final Development Plans
Roadway Improvements as described in the DEIR (Chapter III.B)	Developers of Specific Plan projects (shares to be determined at time of subsequent approvals)	City of Antioch, Community Development Department, Land Planning Services Division	Verify that appropriate contributions have been made by Specific Plan landowners	Requirement of Tentative Maps and/or Final Development Plans
Signalizations as described in the DEIR (Chapter III.B)	Developers of Specific Plan projects (shares to be determined at time of subsequent approvals)	City of Antioch, Community Development Department, Land Planning Services Division	Verify that appropriate contributions have been made by Specific Plan landowners	Requirement of Tentative Maps and/or Final Development Plans
B10 Assure that subsequent plans provide for adequate access to onsite commercial and employment areas in a manner complying with the Specific Plan and with City of Antioch standards	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Verify that project proposals adequately incorporate design features that meet City requirements and all applicable standards at the time individual projects are considered	Requirement of Final Development Plans
B11, 12, 13 Intersections, roadways, sidewalks and bike lanes shall be designed in subsequent plans to meet the City's standards	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Verify that project proposals adequately incorporate design features that meet City requirements and all applicable standards at the time individual projects are considered	Requirement of Final Development Plans

Mitigation Measure	Responsibility for Implementation	Responsibility for Monitoring	Action by Monitor	Compliance
TRANSPORTATION (cont'd)				
B14 Provide for bicycle parking, showers at employment centers and connections to adjacent development	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Verify that project proposals adequately incorporate design features that meet City requirements and all applicable standards at the time individual projects are considered	Requirement of Final Development Plans
B15, 16, 17 Provide site-specific layout and circulation design for school-related circulation, delivery access and parking, emergency vehicle access, and user parking	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Verify that project proposals adequately incorporate design features that meet City requirements and all applicable standards at the time individual projects are considered	Requirement of Final Development Plans
B18 Implement a detailed construction traffic plan	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Conduct compliance investigations periodically during construction near and at the construction site during construction activity to verify achievement of traffic plan objectives	To be submitted with Use Permit applications
B19 To enhance the transit accessibility of the project: 1a The project shall be designed for pedestrian access to arterial and collector streets 1b Cul-de-sacs that back onto arterial and collector streets shall have a pedestrian/ bicycle link between the cul-de-sac and the main road 2 Bus turnouts and passenger shelters shall be provided on major streets to accommodate future transit service	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Verify that project proposals adequately incorporate design features that meet City requirements and all applicable standards at the time individual projects are considered	Requirement of Final Development Plans

Mitigation Measure		Responsibility for Implementation	Responsibility for Monitoring	Action by Monitor	Compliance
TRANSPORTATION (cont'd)					
B20	Implement incentives for employment-bearing land uses to help assure that employment in FUA #2 shall be established in the same general time frame as housing	City of Antioch	City of Antioch, Community Development Department, Land Planning Services Division		Requirement of Final Development Plans
AIR QUALITY					
C1a	The proposed project shall comply with the air quality policies of the *Antioch General Plan* by ensuring that the local circulation system will encourage and accommodate the use of transportation modes other than the automobile	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Verify compliance with the City's General Plan and that appropriate features have been incorporated into project plans	Requirement of Final Development Plans
C1b	Antioch's Transportation Demand Management (TDM) ordinance shall be applied to all phases of the proposed project and include specific trip reduction goals and enforcement procedures	Developers of Specific Plan projects	City of Antioch, East County TDM Coordinator	Verify application of the City's TDM ordinance and that appropriate provisions have been incorporated into Specific Plan projects	Prior to issuance of building permits
C2	Control construction period fugitive dust in all phases of project development beyond the initial phase, using methods described in the DEIR (Chapter III.C)	Developers of Specific Plan projects	City of Antioch, Community Development Department, Building Inspection Division	Conduct compliance investigations during construction to verify that fugitive dust is controlled according to mitigation specifications	Prior to issuance of grading permits and ongoing during construction
NOISE					
D1a	Limit hours of noise-generating construction activity to the hours of 8:00 AM to 5:00 PM. Trucks shall be restricted to major arterial roadways and shall avoid residential neighborhoods when possible	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Conduct occasional site visits to verify compliance. Respond to complaints alleging non-compliance. Record each site visit and complaint	During construction as needed
D1b	Minimize equipment noise by properly muffling and maintaining all construction equipment	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Conduct occasional site visits to verify compliance. Respond to complaints alleging non-compliance. Record each site visit and complaint	During construction as needed

Mitigation Measure		Responsibility for Implementation	Responsibility for Monitoring	Action by Monitor	Compliance
NOISE (cont'd)					
D1c	Protect sensitive receptors from excessive construction noise as described in the DEIR (Chapter III.C).	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Conduct occasional site visits to verify compliance. Respond to complaints alleging non-compliance. Record each site visit and complaint	During construction as needed
D2a	Use open space buffer zones and/or noise barriers along roadways to reduce the CNEL to 60 dBA or less, as specified in the DEIR (Chapter III.D)	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Verify that noise attenuation features are incorporated into proposed projects consistent with approved plans	Requirement of Tentative Maps or Final Development Plans, as appropriate
D2b	Site and design residences to meet interior noise standards, as specified in the DEIR (Chapter III.D)	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Verify that recommended mitigation measures are incorporated into proposed project	Requirement of Final Development Plans (site design) and prior to issuance of building permits (building design)
GEOLOGY, SOILS AND SEISMICITY					
E1	A project grading plan shall be prepared by a licensed civil engineer pursuant to Uniform Building Code requirements for each Specific Plan project, consistent with the specifications of the DEIR (Chapter III.E)	Developers of Specific Plan projects	City of Antioch, Community Development Department, Building Inspection Services Division	Review and approve grading plan; verify incorporation of recommended mitigation measures into proposed project	Requirement of Final Development Plans
E2	Site and building design shall take account of weak and/or expansive soils, consistent with the specifications of the DEIR (Chapter III.E)	Developers of Specific Plan projects	City of Antioch, Community Development Department, Building Inspection Services Division	Verify incorporation of recommended mitigation measures into proposed project	Requirement of Final Development Plans (site design) and prior to issuance of building permits (building design)
E3a	Site planning and building design shall incorporate provisions to reduce risk to life and property from seismic activity	Developers of Specific Plan projects	City of Antioch, Community Development Department, Building Inspection Services Division	(1) Verify that building plans incorporate provisions to reduce risk to life and property from seismic activity; (2) conduct site inspection during and upon completion of building construction	Prior to (1) issuance of building permits; (2) issuance of certificates of occupancy

Mitigation Measure		Responsibility for Implementation	Responsibility for Monitoring	Action by Monitor	Compliance
GEOLOGY, SOILS AND SEISMICITY (cont'd)					
E3b	All buildings, underground utilities and other improvements shall be designed and constructed in accordance with seismic design criteria presented in the Uniform Building Code (see DEIR, Chapter III.E)	Developers of Specific Plan projects	City of Antioch, Community Development Department, Building Inspection Services Division	(1) Verify compliance with Uniform Building Code seismic design criteria; (2) Conduct site inspection during and upon completion of building construction	Prior to (1) issuance of building permits; (2) issuance of certificates of occupancy
E4	Implement actions (described in DEIR, Chapter III.E) to protect the public from risks associated with natural gas extraction activities, for the duration of those activities	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Verify incorporation of recommended mitigation measures into proposed project	Prior to issuance of first building permit
FLOODING AND DRAINAGE					
F1	Prepare and comply with Storm Water Pollution Prevention Plan, as described in the DEIR (Chapter III.F)	Developers of Specific Plan projects	City of Antioch, Community Development Department, Engineering Services Division	Verify preparation of and compliance with the Storm Water Pollution Prevention Plan	Prior to (1) issuance of grading permits; (2) during construction; and (3) during operation of the project
F2	Defer development in the 100-year flood zone until capacity improvements have been provided for	Developers of Specific Plan projects	City of Antioch, Community Development Department, Engineering Services Division	Verify construction of improvements and appropriate contributions by Specific Plan landowners	Prior to issuance of building permits
F3	Construct needed facilities to detain runoff onsite to avoid increased downstream flooding, as specified in the DEIR (Chapter III.F)	Developers of Specific Plan projects	City of Antioch, Community Development Department, Engineering Services Division	Verify construction of improvements and appropriate contributions by Specific Plan landowners	Prior to issuance of building permits

Mitigation Measure		Responsibility for Implementation	Responsibility for Monitoring	Action by Monitor	Compliance
PUBLIC HEALTH AND SAFETY					
G1	Implement measures to assure that site development not result in public safety hazards from accidental fuel releases, from release of asbestos in demolition activities, or from exposure to agriculture-related or other chemicals that may have been used or disposed of onsite (see DEIR, Chapter III.G)	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Review reports/findings of investigators and approve management and remediation plans	Prior to issuance of grading permits
G2	Implement accepted practices to alert the public to the risks of exposure to electromagnetic field (EMF) and to hazardous substances associated with electrical transmission. All existing transformers shall be checked for the presence of PCBs by PG&E. All metal structures or objects located adjacent to transmission line easements shall be properly grounded to prevent electrical shocks from persons or animals in contact with those objects.	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Verify compliance with measures to inform residents of EMF risks, inspection of transformers for PCB hazards and proper grounding of all metal objects in close proximity to electrical transmission line easements	EMF: Upon occupancy of residential units and at any future period when new information on EMF becomes available PCBs: During preparation and review of Final Development Plans Power lines: Prior to issuance of grading or building permits
G3	Comply with all policies, laws and regulations regarding use and storage of hazardous materials, as described in the DEIR (Chapter III.G)	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Verify compliance with all applicable policies, laws and regulations, and adequacy of management practices	Prior to issuance of grading or building permits
G4	Conform with public safety standards with respect to location of residential and other development in the vicinity of operating and abandoned gas wells, as described in the DEIR (Chapter III.G)	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Review reports/findings of investigators and verify that development proposals comply with public safety standards	Requirement of Final Development Plans

	Mitigation Measure	Responsibility for Implementation	Responsibility for Monitoring	Action by Monitor	Compliance
PUBLIC SERVICES					
H1	Incorporate Fire District planning and financing mechanisms into the Specific Plan and development process	City of Antioch in collaboration with CCCCFD	City of Antioch, Community Development Department, Land Planning Services Division	Verify that fee payments have been made, that CCCCFD concerns are addressed in project design, and that timing of development shall occur so as not to overburden CCCCFD resources	Requirement of Final Development Plans
H2	Specification of the appropriate water main sizes to deliver flows at the required rate	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Review project proposals and plans to verify incorporation of specified improvements	Requirement of Final Development Plans
H3a	Accommodate increased school enrollment by a variety of strategies, including provision of portable facilities, year-round education, double sessions and construction of new facilities	Developers of Specific Plan projects in consultation with the City of Antioch	City of Antioch, Community Development Department, Land Planning Services Division	Confirm that proposed projects respond to the need for new and expanded school facilities that result from the development of those projects	Requirement of Final Development Plans
H3b	Require the portions of FUA #2 that are within the AUSD to join the current AUSD Mello-Roos Community Facilities District or provide an alternate funding mechanism for construction of school facilities	Developers of Specific Plan projects in consultation with the City of Antioch	City of Antioch, Community Development Department, Land Planning Services Division	Confirm that the boundaries of the current AUSD Mello-Roos CFD have been adjusted to include the Specific Plan area or that an alternate school funding mechanism is in place	Requirement of Final Development Plans
H3c	Require the portions of FUA #2 that are within the BUESD to join the existing East Contra Costa County School Facilities Funding and Mitigation Agreement with the school district or provide an alternate funding mechanism for construction of elementary and middle school facilities	Developers of Specific Plan projects in consultation with the City of Antioch	City of Antioch, Community Development Department, Land Planning Services Division	Confirm that the properties in the Specific Plan area have been added to the Agreement or that an alternate school funding mechanism is in place	Requirement of Final Development Plans

Mitigation Measure		Responsibility for Implementation	Responsibility for Monitoring	Action by Monitor	Compliance
PUBLIC SERVICES (cont'd)					
H3d	Require the portions of FUA #2 that are within the LUHSD to join the existing East Contra Costa County School Facilities Funding and Mitigation Agreement with the school district or provide an alternative funding mechanism for construction of high school facilities	Developers of Specific Plan projects in consultation with the City of Antioch	City of Antioch, Community Development Department, Land Planning Services Division	Confirm that the properties in the Specific Plan area have been added to the Agreement or that an alternate school funding mechanism is in place	Requirement of Final Development Plans
INFRASTRUCTURE					
I1a	Complete roadway improvements as specified in the DEIR (Chapter III.I)	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Verify construction of improvements and appropriate contributions by Specific Plan landowners	At time of improvement project or prior to development review of individual project, whichever comes sooner
I1b	Provide access and circulation routes to specific parcels	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Verify construction of improvements and appropriate contributions by Specific Plan landowners	At time of improvement project or prior to development review of individual project, whichever comes sooner
I1c	Comply with City and State standards (or as modified by Specific Plan guidelines) in circulation and parking design and construction, including, but not limited to, parking standards, handicap requirements, fire equipment access, site distances, etc., as described in the DEIR (Chapter III.I)	Developers of Specific Plan projects	City of Antioch, Community Development Department, Engineering Division	Verify compliance with City design and construction standards for parking and circulation	Requirement of Final Development Plans
I2a	Construct water system improvements as described in the DEIR (Chapter III.I)	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Verify construction of improvements and appropriate contributions by Specific Plan landowners	At time of improvement project or prior to development review of individual project, whichever comes sooner

Mitigation Measure		Responsibility for Implementation	Responsibility for Monitoring	Action by Monitor	Compliance
INFRASTRUCTURE (cont'd)					
I2b	Compliance with City design and construction standards, including connections as required by the City of Antioch's ADCD, Engineering Department and internal water distribution plans meeting City standards for various land uses, fire flows and landscape needs (see DEIR, Chapter III.I)	Developers of Specific Plan projects	City of Antioch, Community Development Department, Engineering Services Division	Verify compliance with City design and construction standards for domestic water supply	Requirement of Final Development Plans
I3a	Extend sewer lines ranging in size from 8" to 12"	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Verify construction of improvements and appropriate contributions by Specific Plan landowners	At time of project construction
I3b	Comply with City design and construction standards, including incorporating sewer connection requirements, manholes and any other needed improvements in the overall design and submitting those plans for City review and approval	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Verify compliance with City sewerage design and construction standards	Requirement of Final Development Plans
I3c	Design the internal sewer collection system to address City, State and Federal standards regarding disposal of hazardous materials (from the commercial sites) and submitting plans for such systems to the appropriate responsible agency, as identified in the DEIR (Chapter III.G)	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Verify compliance with City, State and Federal standards for the disposal of hazardous materials	Requirement of Final Development Plans
I4	Development applicants shall provide documentation to the City that electrical, natural gas, cable and telephone services can be provided for all phases of the project in a timely manner	Developers of Specific Plan projects	City of Antioch, Community Devel Department, Land Planning Services Division	Review documentation that specifies providers' ability to furnish utility services, including a schedule	Requirement of Final Development Plans

Mitigation Measure		Responsibility for Implementation	Responsibility for Monitoring	Action by Monitor	Compliance
INFRASTRUCTURE (cont'd)					
I5	Development applicants shall coordinate with the pipeline and irrigation companies and appropriate Health and Safety Agencies with regard to the design, timing, access and easement requirements related to respective utility relocation	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Confirm that development applicants have coordinated with all relevant entities regarding the design, timing, access and easement requirements involved in relocating existing oil pipelines and irrigation laterals	Requirement of Final Development Plans
VEGETATION AND WILDLIFE					
J1	The developer of any subsequent project(s) shall be required to have a formal wetland delineation undertaken and verified by the Army Corps of Engineers, as specified in the DEIR (Chapter III.J)	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Confirm that a formal wetland delineation has been completed and verified by the Army Corps of Engineers, and if necessary, that a wetland replacement plan has been devised and implemented accordingly	Requirement of Tentative Maps and/or Final Development Plans
J2	Develop a site management plan, as specified in the DEIR (Chapter III.J) to prevent water quality degradation	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Review and approve site management plan	Prior to the issuance of grading permitss
J3	Construction activities during the nesting season (February through July) could disturb nesting raptors and shall be preceded by surveys conducted by a qualified ornithologist	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Verify that nesting surveys have been conducted by a qualified ornithologist and that nesting success will not be jeopardized by construction activities	Prior to the issuance of grading permits

Mitigation Measure	Responsibility for Implementation	Responsibility for Monitoring	Action by Monitor	Compliance
CULTURAL RESOURCES				
K1a Initial ground-disturbing construction activities within the site boundaries shall be monitored by a qualified archeologist, as specified in the DEIR (Chapter III.K). A qualified archeological monitor shall be present during excavation and grading at site CA-CCo-691H.	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Identify and assess potential historic archeological resources and determine appropriate response	During excavation and grading activities
K1b Section 7050.5(b) of the California Health and Safety Code shall be implemented in the event that human remains, or possible human remains, are located	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Confirm compliance with Section 7050.5(b) of the California Health and Safety Code	At the time human remains are discovered
VISUAL RESOURCES				
L1 Site planning and grading plans shall respect the integrity of the ridge that is an important visual resource of the planning area	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Confirm that site planning and grading plans for individual projects comply with all applicable visual resource preservation guidelines, including those advocated in the Specific Plan	Requirement of Final Development Plans
L2a Utilize site plan review and design review to mitigate any adverse aesthetic impacts of the Specific Plan	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Review proposed Final Development Plan to insure incorporation of Design Review Board recommendations	Requirement of Final Development Plans
L2b The City of Antioch shall take steps, as part of its participation in planning for the SR 4 Bypass, to assure that sound attenuation elements of the Bypass satisfy the city's design guidelines	Developers of Specific Plan projects	City of Antioch, Community Development Department, Land Planning Services Division	Review sound attenuation elements of the SR 4 Bypass project to ensure compliance with the City's design guidelines	Requirement of Final Development Plans

Appendix J

City Council Resolution 2005/14
Amending General Plan Exterior Noise Levels

Council action

RESOLUTION NO. 2005/14

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ANTIOCH APPROVING AN AMENDMENT TO THE GENERAL PLAN CHANGING THE ALLOWABLE MAXIMUM EXTERIOR NOISE LEVEL FOR NEW SINGLE FAMILY AND NEW MULTIPLE FAMILY RESIDENTIAL UNITS OUTDOOR LIVING AREAS LOCATED ADJACENT TO A PLANNED EXPRESSWAY OR BART/eBART DEVELOPMENT FROM 60 CNEL TO 65 CNEL AND FLEXIBLE STANDARDS FOR EXISTING RESIDENTIAL OUTDOOR LIVING AREAS ADJACENT TO PLANNED FREEWAY EXPANSION, PROVIDING THERE WOULD BE NO SIGNIFICANT INCREASE IN CURRENT NOISE LEVELS.

WHEREAS, the City Council of the City of Antioch did receive an application from the City of Antioch for the approval of an amendment to the Environmental Hazards section of the General Plan to modify the allowable maximum exterior noise level for new single family and new multiple family residential units outdoor living areas located adjacent to a planned expressway (State Route 4 Bypass) or any Bart/eBart development from 60 CNEL to 65 CNEL and to allow flexible noise levels at existing residential outdoor living areas adjacent to a planned freeway expansion (State Route 4) subject to no significant (5 CNEL or greater) increase (Citywide) (GP-04-3); and

WHEREAS, the City Council did receive a recommendation for approval of this project from the Planning Commission; and

WHEREAS, a Negative Declaration was prepared and circulated pursuant to the California Environmental Quality Act and no comments were received during the public review period; and

WHEREAS, the City Council duly gave notice of public meeting as required by law; and

WHEREAS, on February 8, 2005, the City Council duly held a public meeting, received and considered evidence, both oral and documentary; and

WHEREAS, recent traffic and noise analysis has shown that it is not practical to meet the City's maximum exterior residential noise standard of 60 CNEL without in many cases constructing sound walls in excess of ten to fifteen ft. in height or more; and

WHEREAS, the negative visual impacts created by such large sound walls outweigh the benefits that might be achieved by holding to the current 60 CNEL standard; and

WHEREAS, the City would benefit in having flexibility in applying the maximum exterior noise standards; and

WHEREAS, CALTRANS and other local communities utilize a maximum exterior noise level of 65-67 CNEL adjacent to freeways and expressways.

NOW THEREFORE BE IT RESOLVED that the City Council does hereby approve that the General Plan exterior noise standards be modified as shown in Exhibit A incorporated herein by reference.

* * * * * * *

I HEREBY CERTIFY that the foregoing resolution was passed and adopted by the City Council of the City of Antioch at a regular meeting thereof, held on the 8th day of February, 2005 by the following vote.

AYES: Council Members Davis, Kalinowski, Conley and Mayor Freitas

NOES: None

ABSENT: Council Member Simonsen

L. JOLENE MARTIN, City Clerk

Appendix K

City of Antioch Project Pipeline
August 15, 2008

CITY OF ANTIOCH PROJECT PIPELINE

Residential Projects

Project Number(s)	Project	Applicant	Location	APN	Units	Site Size	Status	Planner
RDA-03-07 PD-04-14 UP-04-30 AR-05-23 AR-07-17	Almondridge East Tract 7906	KB Associates 6700 Knoll Center Parkway Pleasanton, CA 92821	Philips Lane	051-200-053	81 SFD	21 acres	In plan check Approved PC scheduled 6/18/08 CC approved 7/8/08	Gentry
UP-03-24 V-04-07	Baywoods Condo Conversion	AGI Capital Group 1375 Sutter St #300 San Francisco, CA 94109	2005 San Jose Drive	076-440-032	Convert 128 apts to condos		PC approved Council approved 1st phase completed 2nd phase under construction	Gentry
AR-06-09 UP-01-25	Black Diamond Ranch 7487, 8585, 8586	Discovery Builders 4061 Port Chicago HWY #1 Concord, CA 94524	Somersville Road and James Donlon		Unit 1 58 SFD Unit 2 117 SFD Unit 3 105 SFD		Built Under Const Under Const	Stahl
MDP-06-02 RDA-07-05	Deer Valley Estates	Allied Investments 1033 Detroit Avenue Concord, CA 94520	Off Deer Valley Road north of Kaiser	057-02-002	136 SFD	37.25	MDP PC approved 1/16/08	Morris
RDA-03-05	Golden Bow Estates 8538	Dhyanyoga Centers P.O. Box 3194 Antioch, CA 94531	Off Lexington	076-031-036	12 SFD		Approved	Gentry
AR-04-40	Hidden Glen 6909,7505, 8387, 8388	Arcadia Homes 115 Coleman Avenue San Jose, CA 95110	Off Hillcrest at Hidden Glen		Unit 1 89 SFD Unit 2 81 SFD Unit 3 111 SFD Unit 4 90 SFD		Under Const Approved Approved Approved	Oshinsky
MDP-07-01	Leung Master Development Plan (Sand Creek Estates)	Waters Fund II, LLC 150 Almaden Blvd, Ste 700 San Jose, CA 95113	Southern boundary of Antioch, west of Deer Valley Road	057-041-013 057-041-016 057-041-015	190 SFD	160 acres	On hold	Oshinsky
	Meadow Creek Village	Albert D Seeno Construction	Off Lone Tree Way at		Unit 1 55 SFD		Built	Stahl

	7862, 7947, 7967, 7971, 7897	4021 Port Chicago Highway Concord, CA 94524			Unit 2 77 SFD Unit 3 108 SFD Unit 4 96 SFD Unit 5 97 SFD		Built Built Built Under Const	
AR-03-33	Mira Vista Hills 6708, 6921	Albert D Seeno Construction 4021 Port Chicago Highway Concord, CA 94524	Off James Donlon at east of Somersville		Unit 13 95 SFD Unit 16 85 SFD		Being Reviewed Under const	Stahl
UP-04-01 AR-07-07	Monterra (Nelson Ranch) 6893, 8850, 8851	Standard Pacific Housing 3825 Hopyard Road #195 Pleasanton, CA 94588	Wild Horse Road	052-061-039	Unit 1 102 SFD Unit 2 128 SFD Unit 3 130 SFD	145 acres	Under Construction	Morris
AR-04-45	Oakley Knolls	Discovery Builders 4061 Port Chicago HWY #1 concord, CA 94524	Off Oakley Road	051-180-014	16 SFD	5.5 acres	Approved	Gentry
	Oakley Meadows	Michelle Sidriean 4160 S. Royal Links Circle Antioch, CA 94509	Off Oakley Road at		13 SFD		Approved	Gentry
PD-08-03 AR-08-10	Park Lake Apartments	Loving and Campos 345 Ygnacio Valley Road Walnut Creek, CA 94596	James Donlon Blvd	072-011-062	60 MFD	3.28 acres	Incomplete	Morris
UP-08-04 AR-05-05	Park Ridge	Davidon 1600 S Main Street Ste 150 Walnut Creek, CA 94596	Canada Valley Road	053-060-023	562 SFD	171 Acres	In progress	Gentry
MDP-05-01 RDA-07-01	Pulte Senior Housing	Pulte Homes 6210 Stone Ridge Mall 5th Floor Pleasanton, CA 94588	At the end of Heidorn Ranch Road	057-030-001 057-050-013	550 +/- Del Webb adult community	194 acres	Incomplete	Welch
PD-04-12	Renaissance at Bluerock 8884	KB Homes 6700 Knoll Center Parkway Pleasanton, CA 94566	Bluerock and Lone Tree Way		86 SFD		Under const	Morris
PDP-06-04	Rivertown Village	Don Ladpidus 991 Solana court Mountainview, CA 94040	1700 4th Street	074-040-047	202 SFD		PDP Processed	Oshinsky
RDA-07-03 PD-07-03 UP-08-05 AR-08-07	Roddy Ranch	Roddy Ranch PBC, LLC 12885 Alcosta Blvd., Suite A San Ramon, CA 94583	West of Deer Valley Road South of Empire Mine Road	057-060-017	574 SFD +/- 126 multi family Hotel		In progress	Gentry
RDA-04-03	Sand Creek Active Adult Community	Topaz Creek Investors 275 Saratoga Ave #105 Santa Clara, CA 95050	Empire Mine Road	057-010-001	1500 SFD - senior		Approved	Wehrmeister
AR-05-01	Sand Creek Ranch	William Lyons Homes	Off Canada Valley Road		8640 69 SFD		Built	Stahl

	8640, 8885, 8948	2603 Camino Ramon #150 San Ramon, CA 94583	& Lone Tree Way		8885 42 SFD 8948 52 SFD		Under Const Under Const	
AR-05-02 UP-08-06 AR-08-09	Sand Creek Ranch Rivergate 8640, 8886, 8951	Shea Homes 2580 Shea Center Drive Livermore, CA 94551	Off Canada Valley Road & Lone Tree Way		8640 28 SFD 8886 30 SFD 8951 156 SFD		Under Const Under Const Proposed unit mix change PC approved 7/2/08 DRB approved 7/9/08 Council scheduled 8/12/08	Stahl
UP-04-28	Sierra Vista 7722	Suncrest Homes 300 H Street Antioch, CA 94509		075-052-016	50 SFD		Approved	
PDP-08-01 RDA-08-01	Smith parcel	LCA Architects	Southeast Antioch off Deer Valley Road	057-060-014	50 SFD and 8.5 acres of retail		Accepted	
PDP-06-03 RDA-07-02 PD-08-01 UP-08-01 AR-08-03	The Pointe	Discovery Builders 4061 Port Chicago Hwy #H Concord, CA 94520	North of James Donlon at Somersville		72 SFD		RDA approved 1/22/08 In Progress	Gentry
PDP-06-05 RDA-06-01 PD-08-03 UP-08-14 AR-08-12	Tierra Villas	Mission Peak Homes 40480 Encyclopedia Circle Fremont, CA 94538	5020 Heidorn Ranch Road	056-130-013	122 SFD		RDA approved 1/22/08 Accepted	Morris
UP-08-07	Vista Grande Mobile Estates	Vista Grande Mobile Estates 2901 Somersville Road Antioch, CA 94509	2901 Somersville Road	076-010-029	Addition of 6 new coach sites		Incomplete	Stahl
PDP-07-03 RDA-07-04	Wilbur Townhomes	Joseph Bosman 2281 Fairview Avenue Brentwood, CA 94513	701 & 810 Wilbur Avenue	065-110-006 065-110-007	63 SFD	5.36 acres	RDA approved 1/22/08	Oshinsky
MDP-06-01	Zeka Ranch Estates	Michael Milani 4071 Port Chicago Hwy Concord, CA 94520			314 SFD	639 acres	Incomplete	Carniglia

Commercial Projects

Project Number(s)	Project	Application	Applicant	Location	APN	Bldg Sq Ft Description	Site Size	Status	Staff Report/Reso	Planner
UP-07-07	1700 4th Street/Fowler Property		Trinity Property Consultants 851 81st Avenue, Ste 300 Oakland, CA 94621	1700 4th Street	074-040-047	Re-establish temp uses on property		PC approved 8/1/07		Oshinsky
UP-08-02	1700 4th Street/Fowler Property		Ron Merritt 1666 Willow Pass Road Bay Point, CA 94565	1700 4th Street	074-040-047	10 year temporary use for warehouse and showroom		PC approved		Oshinsky
UP-06-08 AR-06-05	4th Street Gift Shop		Urban Impressions 812 5th Ave. #D Oakland, CA 94606	4th Street near I Street	066-131-011	Construction of 2 story mixed use building		PC approved 6/21/06 DRB approved 6/28/06		Stahl
UP-07-13	Antioch Armory		Allan Tong Antioch, CA 94509	625 W 3rd Street	066-062-007	Sporting goods retail store for hunting, fishing, etc.		PC approved 1/16/08 Under construction		
UP-08-10	Antioch High Scholl cell site		NSA Wireless 12647 Alcosta Blvd #110 San Ramon, CA 94583	700 W 18th Street		New cell site located on Antioch High football field		Incomplete		Stahl
PD-04-09 UP-04-11 AR-04-09	Antioch Surgical Center		MS Walker & Associates, Inc 3551 Pegasus Drive Bakersfield, CA 93308	3500 Hillcrest Avenue	052-370-010	Construct 5500 sq ft outpatient surgery center		PC approved 4/18/07 DRB approved 10/24/07 Council approved		Oshinsky
UP-05-23 AR-06-08	AUTOCARE 2000		Anthony Tabacco & Assoc. 7 Westwood Court Orinda, CA 94563	2700 Somersville Road	074-123-013	Additional 2300 sq ft auto service facility	0.66	PC approved 1/18/06 DRB approved 3/8/06 Approval extended 1/18/08		Stahl
UP-06-14 AR-06-12	Bank of Agriculture		Richard Miller 28 Marsala Way Napa, CA 94558	Lone Tree Way at Country Hills	055-071-080	Subdivision of parcel and development of car wash and bank	2.4 acres	PDP to PC 11/7/07 In progress		Gentry
AR-05-13	Bases Loaded		Cyndi Karp 101 Corte del Pardo Walnut Creek, CA 94598	Corner of 4th Street and G Street	066-142-008	Construction of new restaurant and sports bar	0.2 acres	DRB Approved Under construction		Gentry

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UP-05-02	Bluerock Business Center		Reynolds & Brown 1200 Concord Ave #200 Concord, CA 94520	Bleu Rock Drive at Lone Tree Way	072-012-107			Built		Wehrmeister
PD-07-01 UP-07-06 AR-07-08	Buchanan Crossings Shopping Center		Catlin Properties 3620 Fair Oaks #150 Sacramento, CA 95864	Buchanan Road at Somersville	074-080-013	102,370 square foot shopping center	13.5 acres	PC approved 7/2/08 CC scheduled 8/12/08		
AR-07-13	Casino Building Remodel		Joe Martinez 590 Garland Way Brentwood, CA 94513	101 H Street	066-071-007	Remodel exterior of building		DRB scheduled 8/13/08		Gentry
AR-06-21	Chevron Remodel		Chevron, USA, 145 S. State College #400 Brea, CA 92821	3400 Hillcrest Avenue	052-370-001	Remodel of existing service station		DRB approved 3/28/07 Under construction		Stahl
AR-06-22	Chevron Remodel		Chevron, USA, 145 S. State College #400 Brea, CA 92821	4600 Lone Tree Way	055-170-002	Remodel of existing service station		DRB Approved 3/28/07 Under construction		Stahl
AR-07-14	Chevron Remodel		Johnson United 5201 Pentecost Drive Modesto, CA 95356	3201 Delta Fair Boulevard	074-121-006	Remodel of existing Chevron station		DRB approved 1/9/08 Under Construction		Stahl
Z-08-02	City Gate Rezone		Equus Group 1120 2nd Street Brentwood, CA 94513		051-200-026	Rezone from PBC to PD	15.94 acres	PC scheduled 8/13/08 CC scheduled 9/9/08		Gentry
AR-05-26	Contra Loma Plaza new commercial pad		Choi & Robles Architecture 1001 Marina Village Pkwy #S Alameda, CA 94501	3190 Contra Loma Blvd	076-550-004	New commercial pad		Resubmitted DRB approved 11/28/07		Stahl
UP-07-01 AR-07-02 UP-07-11 AR-05-29 UP-05-34	Costco Gas Station Costco Expansion & Bldg. Move Costco Relocation		Costco 999 Lake Drive Issaquah, WA 98027	Vern Roberts Circle at Crow Ct 2201 Verne Roberts Circle	074-052-020 074-052-033	New service station And relocate existing building Lot merger	1.16 14 acres	Building permits issued Under construction		Gentry
PD-05-03 UP-05-13 AR-05-12	County Square Market		Global Seven Inc. 410 Contra Costa Blvd. Pleasant Hill, CA 94523	E Tregallas Road at Wildflower	052-232-019	New 30,860 sq ft market		Under construction		Oshinsky
UP-08-08	County Square Market		Global Seven Inc. 410 Contra Costa Blvd. Pleasant Hill, CA 94523	E Tregallas Road at Wildflower	052-232-019	Increase in 2nd floor office square footage		In progress		Oshinsky

UP-05-35 AR-06-07	Deer Valley Business Park Parcel 1 + Bldgs N, O, P		MS Walker & Associates, Inc 3551 Pegasus Drive Bakersfield, CA 93308	SW Deer Valley at Country Hills	055-071-071	16 single user/multi tenant bldgs 1800-7000 sq ft	6 acres	DRB approved 1/17/07 Building permit plans being reviewed		Gentry
UP-04-31 AR-04-43 V-06-06	Deer Valley Business Park Parcel 4		BE Deer Valley, LLC 40 Rockingham Drive Newport Beach, CA 92660	Deer Valley Road and Country Hills	055-071-090	5 buildings totaling 35,000 sq ft	3.8 acres	PC approved DRB approved Under construction		Gentry
UP-06-06 AR-06-06	Deer Valley Business Park Silicon Valley College & office/flex building		Chris Gnekow MS Walker & Associates 3551 Pegasus Drive Bakersfield, CA 93308	Deer Valley Road at Country Hills	055-071-072	30,000 sq ft + 17,200 sq ft	5 acres	PC approved DRB approved College built		Gentry
S-06-03	Entry Signage		City of Antioch	Various locations City wide		Approval of new Antioch City signage		DRB approved Council approved In plan check		Wehrmeister
GP-06-02 UP-06-28 AR-06-20	Fitzuren commercial building with produce market		John Rivolli 427 Orchard View Ave Martinez, CA 94553	909 Fitzuren Road	071-021-013	Construct 2 story building with commercial and market uses		Incomplete		Morris
AR-08-06	Gas City re-branding to Shell		Promotions Plus Sign Co, 4920 Reseda Blvd. #250 Northridge, CA 91324	4198 Lone Tree Way	055-071-092	Re-branding of existing station to Shell Oil Co.		DRB approved 7/9/08		Stahl
S-06-07	Gateway monument signage		Cal Neon Illuminart Signs 1012 Morse Avenue, Suite 9 Sunnyvale, CA 94809	Gateway Center 2101 W 10th Street	074-051-005	Installation of new monument sign	1.9 acres	DRB approved Building permit issued		Gentry
AR-07-04	Golf Course Monument Sign		Lone Tree Golf Course 4800 Golf Course Road Antioch, CA 94531	4800 Golf Course Road	072-011-020	Approval of monument sign installed without permits		DRB denied 4/25/07		Stahl
PD-06-04 UP-06-21 S-08-01	Hillcrest Summit		Bedrock Ventures Inc. 4045 Balfour Avenue Oakland, CA 94610	Hillcrest Avenue and E Tregallas	052-100-055	1500 sq feet retail 35,077 sq ft office	5 acres	PC approved 1/16/08 DRB approved 1/23/08 City Council approved 2/26/08		Gentry
PD-07-04 UP-07-21 AR-07-24	Hillcrest Village		Venture Corp. 125 E Sir Francis Drake, 3rd Fl Larkspur, CA 94939	Hillcrest Ave @ Wildflower	052-140-002	Mixed use commercial/retail approx 96,000 s.f.		In progress		
S-08-04	Holy Cross Cemetery Monument Sign		Catholic Cemetery PO Box 488 Lafayette, CA 94549	2200 E 18th Street	051-170-040	Installation of new monument signage		Incomplete		Stahl

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UP-07-16 AR-07-12	In Shape Health Club pool slide		In Shape Health Clubs Inc 1016 E. Bianchi Rd, #A-23 Stockton, CA 95210	4065 Lone Tree Way	072-012-084	Add slide to outdoor pool	17.8 acres	PC approved 4/2/08 DRB approved 4/9/08 In plan review		Gentry
V-08-05	Islamic Center fence		Islamic Center of East Bay 315 W 18th Street Antioch, CA 94509	315 W 18th Street	067-221-021	Install a 4 foot fence within the landscape setback		Accepted		
AR-08-13	Jack-in-the-Box sign and re-image		Stantec Consulting 6070 West Oaks Blvd. #200 Rocklin, CA 95765	2705 Hillcrest Avenue	052-012-057	Repaint exterior of building and modify exterior signage		Accepted		
AR-07-18	Jensen Office Building		Terry Jensen 4913 Union Mine Ct Antioch, CA 94509	Lone Tree Way	071-101-022	Design review of new 2 story office building	0.23 acres	DRB approved11/28/07 In plan review		Stahl
V-08-01 AR-08-04	Juliet Plaza		2100 Holdings LLC 1280 11th Avenue San Francisco, CA 94122	2100 L Street at Sycamore Drive	074-343-034	7400 square foot retail soace		Incomplete		Stahl
FD-03-06 UP-03-26 AR-03-38	Kaiser Medical Center		Kaiser Foundation Hospitals 1950 Franklin Street 12th Flr Oakland, CA 94605	6200 Deer Valley Road	057-022-003	60,500 sq ft medical building		Building constructed		Oshinsky
UP-06-19 AR-06-24	Little Angels Preschool		Estella Sierra 1816 Hillcrest Avenue Antioch, CA 94509	1816 Hillcrest Avenue	068-091-042	Operation of new preschool		PC approved DRB approved Building permit issued		Gentry
UP-08-03	Live Entertainment permit for Mutiny		Street Titans, LLC 422 W 2nd Street Antioch, CA 94509	422 W 2nd Street		Permit to allow recurring live entertainment at Mutiny		PC approved 5/21/08		Stahl
UP-08-09	Lone Tree Convenience Store		BG Market 4040 Meadowlake Street Antioch, CA 94509	5005 Lone Tree Way		Convenience store with liquor sales at Lone Tree Landing		In progress		Oshinsky
PD- AR-04-26 UP-04-21	Lone Tree Landing		John Tomasello 516 Nelly Court Alamo, CA 94507	Lone Tree Way at Hillcrest	056-012-024	81,690 sq feet retail center	413,790 sq ft	Partially completed		Oshinsky
AR-06-23 UP-06-24	Lone Tree Landing Water Feature		John Tomasello 516 Nelly Court Alamo, CA 94507	Lone Tree Way at Hillcrest	056-012-024	New water feature on corner		DRB approved 3/14/07 City Council approved 5/22/07 Completed		Oshinsky
PD-07-02 UP-07-08 AR-07-11	Markstein Distribution Center		ARCO National 1155 Beecher Street San Leandro, CA 94577			New 101,646 sq foot office/ distribution facility		PC approved DRB approved 11/14/07		Morris

								Under construction		
UP-07-05 AR-07-06	McDonald's Remodel		McDonalds 299 Oak Road #900 Walnut Creek, CA 94597	2424 Mahogany Way	074-370-011	Remodel existing building and play place		Lot merger approved 12/5/07 Resubmitting		Gentry
S-07-03	Meineke & Econo Lube Signage		All Sign Services 1290 Waterfall Way Concord, CA 94521	1710 Auto Center Drive	074-171-021	Re-branding of existing Econo Lube site		DRB approved 10/24/07 Under construction		
UP-07-23 AR-08-01	Metro PCS antenna at existing water tank site		Network Development 1080 Marina Village Pkwy Alameda, CA 94501	Neroly Road	053-060-013	Add antenna at existing non City owned water tank site		PC approved 4/16/08		Stahl
UP-07-22 AR-07-25	Metro PCS co-location Deer Valley Road		Network Development 1080 Marina Village Pkwy Alameda, CA 94501	5201 Deer Valley Road	05-170-006	Add antenna to building roof top		ZA approved 3/18/08 DRB approved 4/9/08		Stahl
UP-05-30 AR-05	Perinatal Council		Barbara Bunn McCullough 2648International Blvd Oakland, CA 94601	521 W 5th Street	066-143-003	Addition to existing building		PC approved 10/19/05 DRB approved 12/14/05 Under construction		Stahl
V-08-02	Perinatal Council		Barbara Bunn McCullough 2648International Blvd Oakland, CA 94601	521 W 5th Street	066-143-004	Variance to install wood fence instead of masonry brick wall		Incomplete		Stahl
UP-06-17 AR-06-15 V-06-03	Produce Market		Frank Hamedi 131 Tully Road San Jose, CA 9511	914 A Street	066-172-001	Remodel building and operate produce market	0.4 acres	Incomplete		Gentry
S-06-04	Raley's Monument Sign		American Electric Sign 3710 Lone Tree Way #113 Antioch, CA 94509	3612 Lone Tree Way	071-171-031	Add monument sign		DRB Approved 12/20/06		Stahl
AR-07-26	Raley's Shopping Center remodel		Cal-American 1925 Century Park East #2100 Los Angeles, CA 90067	3612 Lone Tree Way	071-181-031	Remodel of existing shopping center		DRB denied 4/23/08		Stahl
UP-08-11 AR-08-11 V-08-03	Ramada Inn Cell Site		Black Dot Wireless 320 Commerce, Ste 200 Irvine, CA 92602	2436 Mahogany Way	074-370-022	New cell sites located in a new Ramada sign		Incomplete		Stahl
GP-07-01 Z-07-05	Reynold's & Brown GP amendment and Rezone		Reynold's and Brown 1200 Concord Avenue Concord, CA 94520	Northwest corner of Lone Tree Way and Golf Course	072-012-087	Change GP and zoning to Neighborhood/Community Commercial zoning designation		In progress		Morris

				Road						
UP-06-13	Rivertown Business Center		Architectural Network, Inc. 111 Civic Drive #260 Walnut Creek, CA 94596	I Street and 1st Street	066-091-010	16,000 sq ft new office/restaurant		Extension Approved		Oshinsky
AR-03-36	Seventh Day Adventist Church		Delta View Enterprises 3737 Lone Tree Way Antioch, CA 94509	2200 Country Hills	055-071-105	New 39,000 sq ft church		DRB 2/21/04 DRB (landscape) 3/1/06 Under construction		Stahl
AR-08-02	Seventh Day Adventist Church 8-plex Administrative Housing		Delta View Enterprises 3737 Lone Tree Way Antioch, CA 94509	2200 Country Hills	055-071-105	New 8-plex administrative housing unit.		DRB approved 5/14/08		Stahl
UP-05-22 AR-05-22	St Ignatius Church Expansion		Roman Catholic Bishop, 3551 Contra Loma Blvd. Antioch, CA 94509	3351 Contra Loma Blvd	071-370-026	12,995 sq ft expansion of existing church		Building permit issued for on-site work		Gentry
UP-05-31 AR-05-27	Starbucks @ Hillcrest and Wildflower		Java Acquisition company 0049 135 East 57th Street, 23rd Floor New York, NY 10022	Hillcrest Ave & Wildflower	052-460-011	Starbucks and retail center	3 acres	PC approved 11/7/07 DRB approved 11/14/07		Gentry
AR-07-16 S-07-05	Starbucks at Somersville Towne Center		Starbucks 17700 New Hope St. Ste 200 Fountain Valley, CA 92708	2500 Somersville Road	074-450-036	New Starbucks		DRB approved 10/10/07 Under construction		Gentry
UP-05-36 AR-05-31	Sunset Drive Indoor Sports Center		Steve Fosenburg PO Box 4516 Antioch, CA 94509	1210 Sunset Drive	068-253-003	Indoor Hockey Rink and batting cages		Approved In plan check		Wehrmeister
UP-07-14 AR-07-19	T-Mobile cell site at Kaiser Deer Valley		Alex Monk 185 Berry Street Suite 5300 San Francisco, CA 94107	2601 Deer Valley Road	057-022-014	T-mobile proposes to install wireless antennas on Kaiser roof top		In progress		Stahl
UP-07-03	Tobin World		MS Walker & Associates 3551 Pegasus Drive Bakersfield, CA 93308	2310 Country Hills Drive	055-071-090	Approval of 9600 sq ft school for autistic children	9600 sq ft	PC approved 8/1/07 Under construction TCO issued		Gentry
S-08-02	Union 76 monument sign		Promotions Plus Sign Co, 4920 Reseda Blvd. #250 Northridge, CA 91324	2701 Contra Loma Blvd.	071-011-036	Approval of new monument sign for existing service station		DRB scheduled 8/27/08		Diaz
AR-07-21	Vineyard Business Park Phase III		Carnmer Properties PO Box 2665 Walnut Creek, CA 94595	1699 Vineyard Drive	051-052-074	3 new multi tenant commercial buildings 36,640 s.f. total		DRB approved 1/15/08		

AR-04-25	WalMart Expansion		Robert A. Karn & Associates 707 Beek Avenue Fairfield, CA 94553	4893 Lone Tree Way	056-011-030	33,575 sq ft expansion with additional parking		Resubmitted/In progress		Gillarde
AR-07-09	Williamson Ranch Office building		John Blatter 350 Main St., Suite K Pleasanton, CA 94566	Lone Tree Way	056-011-058	2 story 20,026 s.f. office building	1.25 acres	DRB approved 8/22/07 In plan review		Gillarde

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