

TRAFFIC IMPACT ANALYSIS

**MADISON PLAZA
CITY OF RIVERSIDE
RIVERSIDE COUNTY, CALIFORNIA**



December 9, 2016

TRAFFIC IMPACT ANALYSIS

MADISON PLAZA CITY OF RIVERSIDE RIVERSIDE COUNTY, CALIFORNIA

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INTRODUCTION

This traffic impact analysis (TIA) has been prepared to assess the potential circulation impacts associated with the proposed Madison Plaza Project, located at 3490 Madison Street in the City of Riverside (City). Figure 1 illustrates the regional and project location.

This report is intended to satisfy the requirements established by the City of Riverside “Traffic Impact Preparation Guide,” dated January 2016, as well as the requirements for the disclosure of potential impacts and mitigation measures pursuant to the California Environmental Quality Act (CEQA). The scope of work for this TIA, including trip generation, trip distribution, study area, and analysis methodologies, has been approved by City staff via the Scoping Agreement process. A copy of the Scoping Agreement is included as Appendix A.

This TIA examines traffic operations in the vicinity of the proposed project under the following six scenarios:

- Existing traffic conditions;
- Existing with project traffic conditions;
- Project completion (2017) conditions;
- Project completion (2017) with project traffic conditions;
- Cumulative (2017) traffic conditions; and
- Cumulative (2017) with project traffic conditions.

For each scenario, traffic operations at study intersections are evaluated for the a.m. and p.m. peak hours. The a.m. peak hour is defined as the one hour of highest traffic volumes occurring between 7:00 and 9:00 a.m. The p.m. peak hour is defined as the one hour of highest traffic volumes occurring between 4:00 and 6:00 p.m.

STUDY AREA DETERMINATION

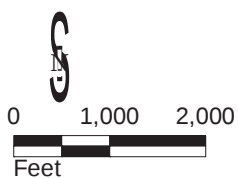
The study area was approved by City staff via the City’s scoping agreement process (Appendix A). Study intersections were selected based on discussion with City staff and where project traffic has the potential to cause a significant impact. The study area includes the following ten intersections:

1. Madison Street/Magnolia Avenue;
2. Madison Street/Elementary School Outlet;
3. Madison Street/Orchard Street;
4. Madison Street/Driveway 1-Garden Street;
5. Madison Street/Driveway 2;
6. Madison Street/Mobil Gas Station Access;
7. Madison Street/State Route 91 (SR-91) Westbound Ramps;
8. Madison Street/SR-91 Eastbound Ramps;



FIGURE 1

LSA



SOURCE: Bing Aerial, 2010; County of Riverside, 2015.

9. Madison Street/Indiana Avenue; and
10. Madison Street/Evans Street.

Figure 2 illustrates the locations of the study intersections.

PROJECT DESCRIPTION

The proposed project consists of a 41,117-square foot supermarket, a 37,849-square foot health club, and a 1,950-square foot fast-food restaurant with drive-through restaurant. The existing 3,943-square foot Denny's restaurant is fully operational. The project is located at 3490 Madison Street. Figure 3 illustrates the site plan for the proposed project.

Access to the project will be provided by two existing driveways on Madison Street. The northern driveway on Madison Street is currently a full-access signalized intersection. With the completion of the project, the west leg will include one eastbound through/left-turn lane, one eastbound right-turn lane, and two receiving lanes into the project. The southern driveway is currently a full-access unsignalized driveway. The proposed project is anticipated to be completed in 2017.

ANALYSIS METHODOLOGY

Level of Service Definitions and Procedures

Roadway operations and the relationship between capacity and traffic volumes are generally expressed in terms of levels of service (which are defined using the letter grades A through F). These levels recognize that, while an absolute limit exists as to the amount of traffic traveling through a given intersection (the absolute capacity), the conditions that motorists experience rapidly deteriorate as traffic approaches the absolute capacity. Under such conditions, congestion is experienced. There is general instability in the traffic flow, which means that relatively small incidents (e.g., momentary engine stall) can cause considerable fluctuations in speeds and delays. This near-capacity situation is labeled Level of Service (LOS) E. Beyond LOS E, capacity has been exceeded, and arriving traffic will exceed the ability of the intersection to accommodate it. An upstream queue will then form and continue to expand in length until the demand volume again declines.

A complete description of the meaning of level of service can be found in the Transportation Research Board Special Report 209, *Highway Capacity Manual* (HCM). The HCM establishes levels of service, as shown in Table A.

Table B shows the level of service criteria for unsignalized and signalized intersections.

Consistent with the City's TIA guidelines, the 2010 HCM analysis methodologies were used to determine intersection levels of service for all study area intersections. All levels of service were calculated using Synchro 9.0 software, which uses the HCM 2010 methodologies.



FIGURE 2

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- Project Location
- Study Area Intersections

SOURCE: Bing Aerial, 2010; County of Riverside, 2015.

Madison Plaza
Traffic Impact Analysis
Study Area Intersections

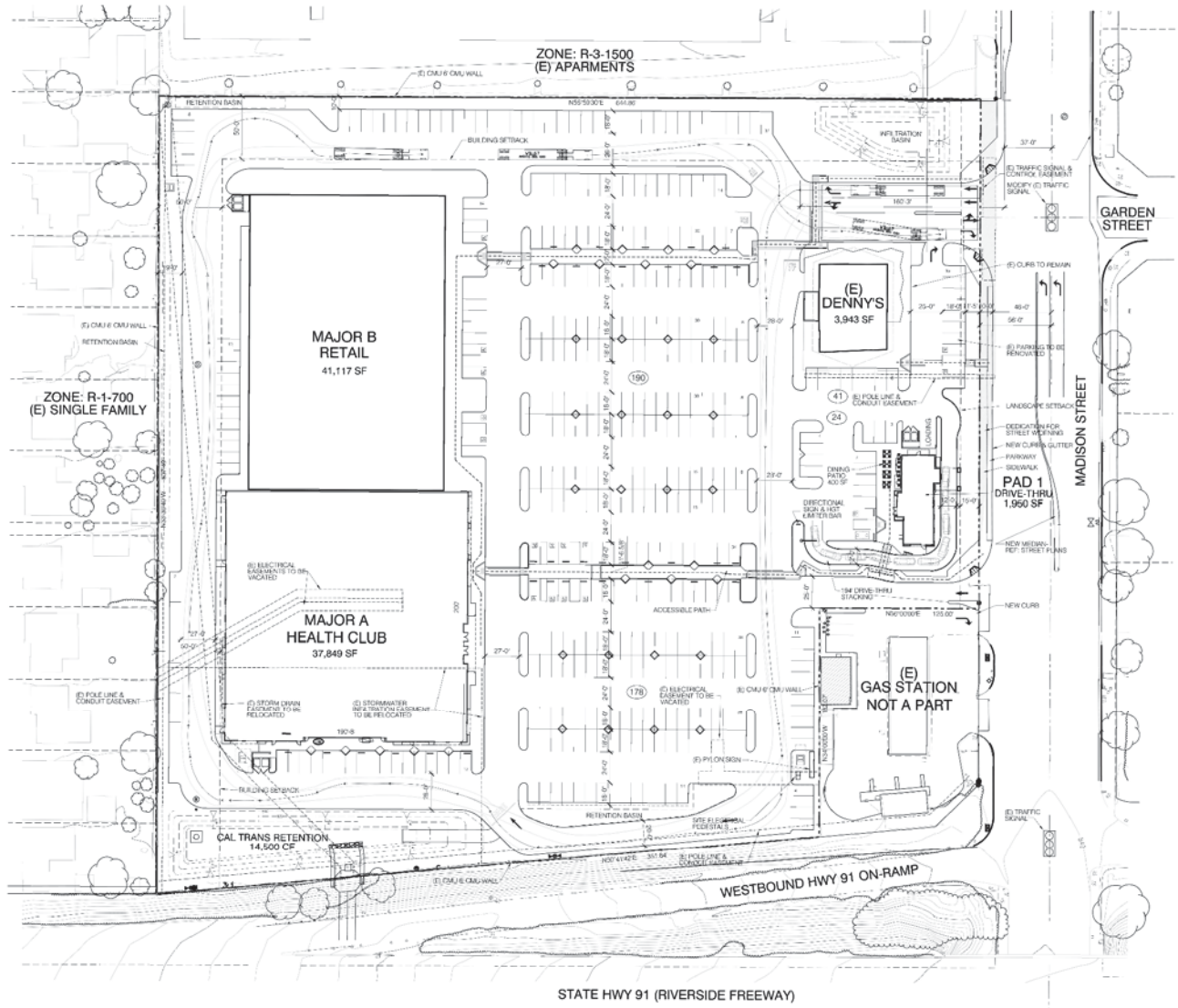


FIGURE 3

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SOURCE: GK Pierce Architects, December 7, 2016.

Exhibit 9 Initial Study

Madison Plaza
Traffic Impact Analysis
Conceptual Site Plan

Table A: Level of Service Definitions

LOS	Description
A	No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication. Typically, the approach appears quite open, turns are made easily and nearly all drivers find freedom of operation.
B	This service level represents stable operation, where an occasional approach phase is fully utilized and a substantial number are approaching full use. Many drivers begin to feel restricted within platoons of vehicles.
C	This level still represents stable operating conditions. Occasionally drivers may have to wait through more than one red signal indication, and backups may develop behind turning vehicles. Most drivers feel somewhat restricted, but not objectionably so.
D	This level encompasses a zone of increasing restriction approaching instability at the intersection. Delays to approaching vehicles may be substantial during short peaks within the peak period; however, enough cycles with lower demand occur to permit periodic clearance of developing queues, thus preventing excessive backups.
E	Capacity occurs at the upper end of this service level. It represents the most vehicles that any particular intersection approach can accommodate. Full utilization of every signal cycle is seldom attained no matter how great the demand.
F	This level describes forced flow operations at low speeds, where volumes exceed capacity. These conditions usually result from queues of vehicles backing up from a restriction downstream. Speeds are reduced substantially and stoppages may occur for short or long periods of time due to the congestion. In the extreme case, both speed and volume can drop to zero.

Table B: Level of Service Criteria for Unsignalized and Signalized Intersections

Level of Service	Unsignalized Intersection Average Delay per Vehicle (sec.)	Signalized Intersection Average Delay per Vehicle (sec.)
A	≤ 10	≤ 10
B	> 10 and ≤ 15	> 10 and ≤ 20
C	> 15 and ≤ 25	> 20 and ≤ 35
D	> 25 and ≤ 35	> 35 and ≤ 55
E	> 35 and ≤ 50	> 55 and ≤ 80
F	> 50	> 80

Level of Service Threshold

The intersections of Madison Street/SR-91 Westbound Ramps and Madison Street/SR-91 Eastbound Ramps are under the jurisdiction of Caltrans. The remaining study intersections are solely under the jurisdiction of the City. Caltrans considers an acceptable level of service to be between C and D (delay of 45 seconds) at all intersections under its jurisdiction. The City uses LOS D as its minimum level of service for intersections and roadways of Collector or higher classification; LOS C is to be maintained on other street intersections.

All study intersections are located on Madison Street. Currently, Madison Street is a four-lane Arterial. Therefore, for study intersections solely under the jurisdiction of the City, LOS D is used as

the minimum standard. For intersections within the jurisdiction of Caltrans, the Caltrans LOS threshold (minimum intersection delay of 45 seconds) is used as a worst-case approach.

Project Significance Threshold

The City's significance criteria are used for all study intersections under the City's jurisdiction. As stated in the City's TIA preparation guide, for projects in conformance with the City's General Plan, a significant project impact occurs at a study intersection when the peak hour LOS falls below D (E or F) per Policy CCM-2.3, which indicates that LOS D or better is to be maintained on Arterial Streets wherever possible. Since the proposed project is consistent with the City's General Plan, a significant project impact occurs when the peak hour LOS falls below D in this analysis.

For Caltrans intersections, a significant project impact occurs when the peak hour delay falls below 45 seconds. If project traffic contributes to a Caltrans intersection already operating at delay greater than 45 seconds in the without project condition, it is considered a cumulative impact.

TRAFFIC VOLUMES WITHOUT PROJECT SCENARIOS

Existing Traffic Volumes

Existing traffic volumes are based on peak hour intersection turn movement counts collected by National Data and Surveying Services in January 2016. Appendix B contains traffic count sheets. Vehicle classification counts were conducted at the intersections of Madison Street/Magnolia Avenue, Madison Street/SR-91 Westbound Ramps, Madison Street/SR-91 Eastbound Ramps, and Madison Street/Indiana Avenue. The percentage of trucks at the remaining study intersections without classification counts was determined from classification counts at nearby intersections.

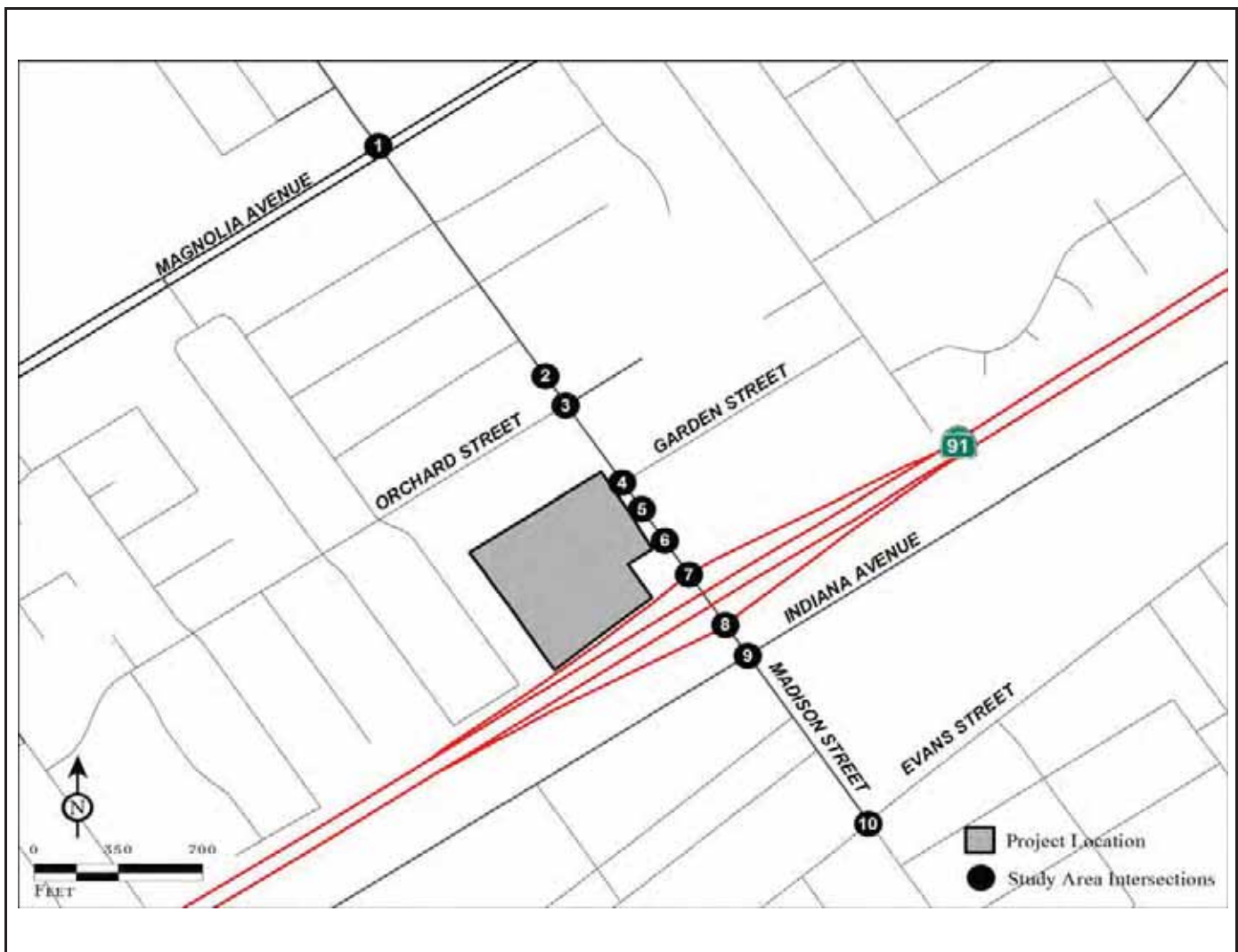
The concept of passenger car equivalents (PCEs) accounts for the larger impact of trucks on traffic operations. It does so by assigning each type of truck a PCE factor that represents the number of passenger vehicles that could travel through an intersection in the same time that a particular type of truck could. Consistent with the HCM 2010 Methodologies, PCE volumes at study intersections were computed using a factor 2.0 for all trucks. Figure 4 illustrates existing peak-hour PCE volumes at study intersections. Detailed volume development worksheets are included in Appendix C.

Project Completion (2017) Traffic Volumes

Project completion traffic volumes (in PCEs) were developed by applying an annual growth rate of 2.0 percent per year (2016 to 2017) to the existing PCE volumes at each study intersection. All assumptions, including the growth rate to be used for opening year analyses, are outlined in the City-approved scoping letter attached as Appendix A. Figure 5 illustrates peak hour PCE volumes at study intersections under project completion conditions. Detailed volume development worksheets are included in Appendix C.

Cumulative (2017) Traffic Volumes

Information concerning cumulative projects in the vicinity of the proposed project was obtained from City staff. Table C lists the cumulative projects included in this analysis. Figure 6 illustrates the cumulative project locations.

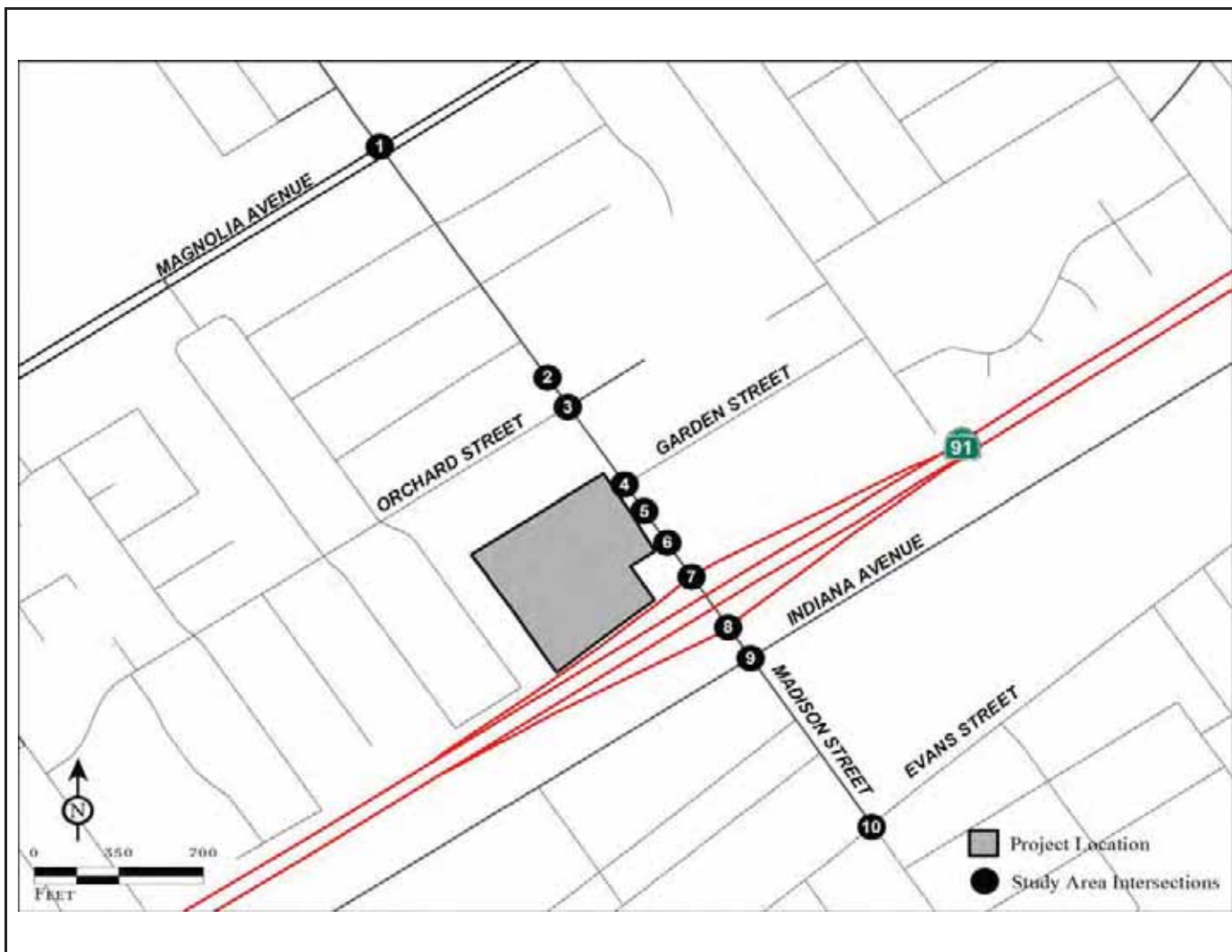


172 / 86 444 / 451 47 / 37 53 / 38 466 / 632 135 / 248 146 / 92 808 / 688 119 / 95 419 / 350 143 / 112	706 / 790 81 / 25 0 / 1 119 / 31 0 / 1 564 / 560 564	76 / 39 627 / 747 122 / 35 11 / 8 23 / 10 112 / 56 59 / 72 553 / 553 89 / 15	18 / 20 697 / 735 43 / 84 61 / 63 0 / 1 66 / 141 12 / 19 1 / 6 7 / 7 15 / 37 611 / 581 43 / 47	13 / 30 749 / 830 8 / 23 4 / 31 0 / 1 6 / 17 2 / 2 19 / 35 40 / 26 663 / 632 21 / 47
1 Madison St/Magnolia Ave	2 Madison St/Elementary School Outlet	3 Madison St/Orchard St	4 Madison St/Dwy 1-Garden St	5 Madison St/Dwy 2
1 / 6 32 / 26 724 / 705 773 / 876	283 / 257 522 / 645 224 / 177 4 / 1 311 / 208 297 / 260 500 / 528 500	593 / 656 240 / 197 86 / 120 22 / 3 77 / 144 711 / 668 369 / 396	165 / 88 289 / 491 216 / 221 299 / 317 156 / 231 21 / 59 211 / 273 767 / 551 36 / 85 35 / 59 571 / 474 38 / 40	24 / 33 258 / 517 21 / 66 58 / 47 9 / 3 2 / 4 36 / 38 9 / 5 25 / 30 13 / 26 558 / 441 8 / 15
6 Madison St/Mobil Gas Station Access	7 Madison St/SR-91 WB Ramps	8 Madison St/SR-91 EB Ramps	9 Madison St/Indiana Ave	10 Madison St/Evans St

LSA FIGURE 4

xxx / yyy AM / PM Peak Hour Traffic Volumes (in PCEs)

Madison Plaza
Traffic Impact Study
Existing Peak Hour Traffic Volumes (in PCEs)



175 / 88 453 / 460 48 / 38 54 / 39 475 / 645 138 / 253 149 / 94 824 / 702 138 / 166 121 / 97 427 / 357 146 / 114 1 Madison St/Magnolia Ave	720 / 806 83 / 26 0 / 1 121 / 32 0 / 1 0 / 1 575 / 571 575 / 571 2 Madison St/Elementary School Outlet	78 / 40 640 / 762 124 / 36 11 / 8 23 / 10 114 / 57 60 / 73 564 / 564 91 / 15 3 Madison St/Orchard St	18 / 20 711 / 750 44 / 86 12 / 19 1 / 6 7 / 7 15 / 38 623 / 593 44 / 48 62 / 64 0 / 1 67 / 144 4 Madison St/Dwy 1-Garden St	13 / 31 764 / 847 8 / 23 2 / 2 19 / 36 41 / 27 676 / 645 21 / 48 4 / 32 0 / 1 6 / 17 5 Madison St/Dwy 2
1 / 6 788 / 894 33 / 27 738 / 719 6 Madison St/Mobil Gas Station Access	289 / 262 532 / 658 228 / 181 4 / 1 317 / 212 303 / 265 510 / 539 7 Madison St/SR-91 WB Ramps	605 / 669 245 / 201 88 / 122 22 / 3 79 / 147 725 / 681 376 / 404 8 Madison St/SR-91 EB Ramps	168 / 90 295 / 501 220 / 225 215 / 278 782 / 562 37 / 87 36 / 60 582 / 483 39 / 41 305 / 323 159 / 236 21 / 60 9 Madison St/Indiana Ave	24 / 34 263 / 527 21 / 67 37 / 39 9 / 5 26 / 31 13 / 27 569 / 450 8 / 15 59 / 48 9 / 3 2 / 4 10 Madison St/Evans St

LSA

FIGURE 5

xxx / yyy AM / PM Peak Hour Traffic Volumes (in PCEs)

Madison Plaza
Traffic Impact Study

Project Completion (2017) Peak Hour Traffic Volumes (in PCEs)

Table C - Cumulative Projects Trip Generation

Project No.	Location	Land Use	Units	Rate	A.M. Peak Hour			P.M. Peak Hour			Daily
					In	Out	Total	In	Out	Total	
1	8069 Indiana Avenue	Automobile Sales Expansion	7,373 TSF	Trips/Unit ¹ Trip Generation	1.44 11	0.48 4	1.92 15	1.05 8	1.57 12	2.62 20	32.30 238
2	North West Corner of Dominion Avenue and Division Street	Fast-Food With Drive Through	3,795 TSF	Trips/Unit ² Trip Generation Pass By Trips ³ Net Trip Generation	23.16 88 (42) 46	22.26 84 (42) 42	45.42 172 (84) 88	16.98 64 (31) 33	15.67 59 (31) 28	32.65 123 (62) 61	496.12 1,883 (146) 1,736
3	North West Corner of Dominion Avenue and Division Street	Condominium	36 D.U.	Trips/Unit ⁴ Trip Generation	0.07 3	0.37 13	0.44 16	0.35 13	0.17 6	0.52 19	5.81 209
4	South of Arlington; between Royale Pl and Sunset Ranch Dr	Single-Family Residential	10 D.U.	Trips/Unit ⁵ Trip Generation	0.19 2	0.56 6	0.75 8	0.63 6	0.37 4	1.00 10	9.52 95
5	3439 Arlington Ave	Shopping Center	15,186 TSF	Trips/Unit ⁶ Trip Generation Pass By Trips ⁷ Net Trip Generation	0.60 9 9	0.36 6 6	0.96 15 15	1.78 27 (10) 17	1.93 29 (10) 19	3.71 56 (19) 37	42.70 648 (19) 629
Total Net Trip Generation					71	71	142	77	69	147	2,908

Notes: TSF = Thousand Square Feet, DU=Dwelling Units

¹Rates based on Land Use 841 "Automobile Sales" from ITE *Trip Generation*, 9th Edition.

²Rates based on Land Use 934 - "Fast-Food With Drive Through" from ITE *Trip Generation*, 9th Edition.

³Pass-by rates based on rates for Land Use 934 - "Fast Food Restaurant with Drive-Through Window" from ITE *Trip Generation Handbook* 2nd Edition.

Since there is no data available for daily pass-by trips, the sum of a.m. and p.m. pass-by trips have been applied to the daily trip generation.

⁴Rates based on Land Use 230 - "Condominium" from ITE *Trip Generation* 9th Edition.

⁵Rates based on Land Use 210 "Single-Family Detached Housing" from ITE *Trip Generation* 9th Edition.

⁶Rates based on Land Use 820 - "Shopping Center" from ITE *Trip Generation* 9th Edition.

⁷Pass-by rates based on rates for Land Use 820 - "Shopping Center" from ITE *Trip Generation Handbook* 2nd Edition. Because there are no data available on a.m. and daily pass-by trips, no reductions have been taken for the a.m. trips, and only the p.m. peak hour pass-by trips have been subtracted from the daily trip generation.

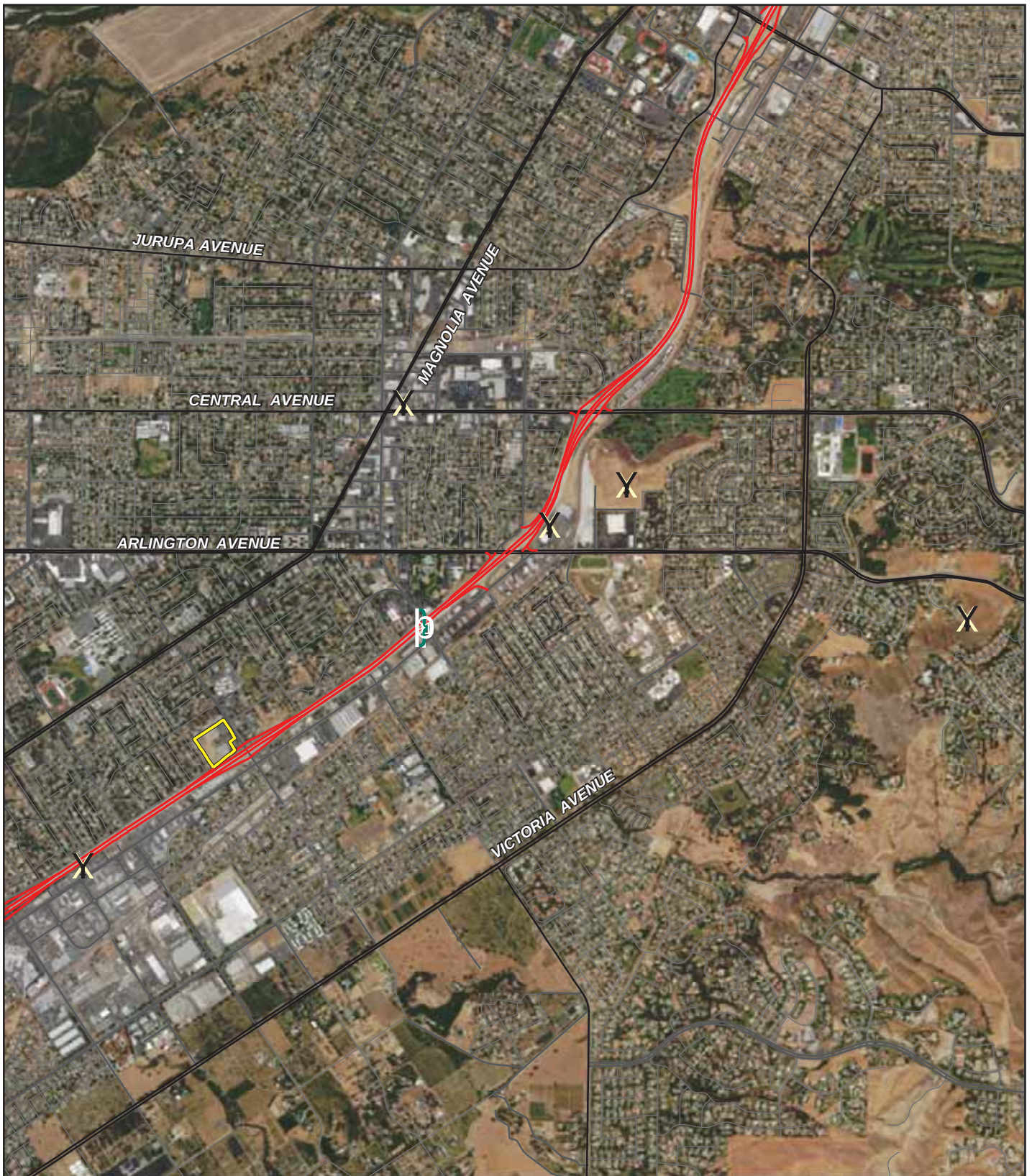


FIGURE 6

*Madison Plaza
Traffic Impact Analysis*

Cumulative Projects

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0 1300 2600
FEET

SOURCE: ESRI, World Imagery, 2012. County of Riverside, 2015.

The trip generation for cumulative projects was developed using rates from the Institute of Transportation Engineers (ITE) *Trip Generation*, 9th Edition. As shown in previously referenced Table C, cumulative projects are expected to generate 2,908 net daily trips, 142 a.m. peak hour net trips, and 147 p.m. peak hour net trips. Cumulative project trips were added to the project completion (2017) traffic volumes to develop cumulative (2017) traffic volumes. Figure 7 illustrates the total cumulative project trips at study intersections. Figure 8 illustrates peak hour PCE volumes under cumulative (2017) conditions.

Detailed volume development worksheets are included in Appendix C.

PROJECT TRAFFIC

Project Trip Generation

The project site currently includes a fully operational Denny's restaurant and recently demolished 33,810-square foot health club. Trip generation for the proposed project was developed using rates from the ITE *Trip Generation* (9th Edition) for Land Use 850 "Supermarket," Land Use 492 "Health/Fitness Club," and Land Use 934 "Fast-Food Restaurant with Drive-Through Window."

Retail and restaurant uses will typically draw some trips from the traffic passing the site on an adjacent street. These trips are not "new" trips made for the sole purpose of visiting the site, but are trips made as an intermediate stop en route to an ultimate destination. These trips are referred to as "pass-by" trips and only affect traffic at project driveways and on streets adjacent to the project. Pass-by trips were calculated using rates from the ITE *Trip Generation Handbook* (2nd Edition).

Table D summarizes the a.m. and p.m. peak hour and daily project trip generation and shows that the project is expected to generate 282 gross a.m. peak hour trips, 587 gross p.m. peak hour trips, and 6,419 gross daily trips. After accounting for pass-by trips, the project would generate 239 net new trips in the a.m. peak hour, 415 net new trips in the p.m. peak hour, and 6,204 net new daily trips.

Project Trip Distribution

The distribution of project trips was developed in consultation with City staff by examining the regional roadway network and the location of the proposed project in relation to the surrounding areas. Figure 9 illustrates the trip distribution for the proposed project. Trip assignment for project trips is the product of the project trip generation and the trip distribution percentages and is illustrated in Figure 10. Figure 11 illustrates the pass-by trip assignment. Figure 12 illustrates the total net project trip assignment.

TRAFFIC VOLUMES WITH PROJECT SCENARIOS

Existing, project completion, and cumulative with project traffic volumes were developed by adding project traffic to the corresponding without project scenarios. Figure 13 illustrates the existing with

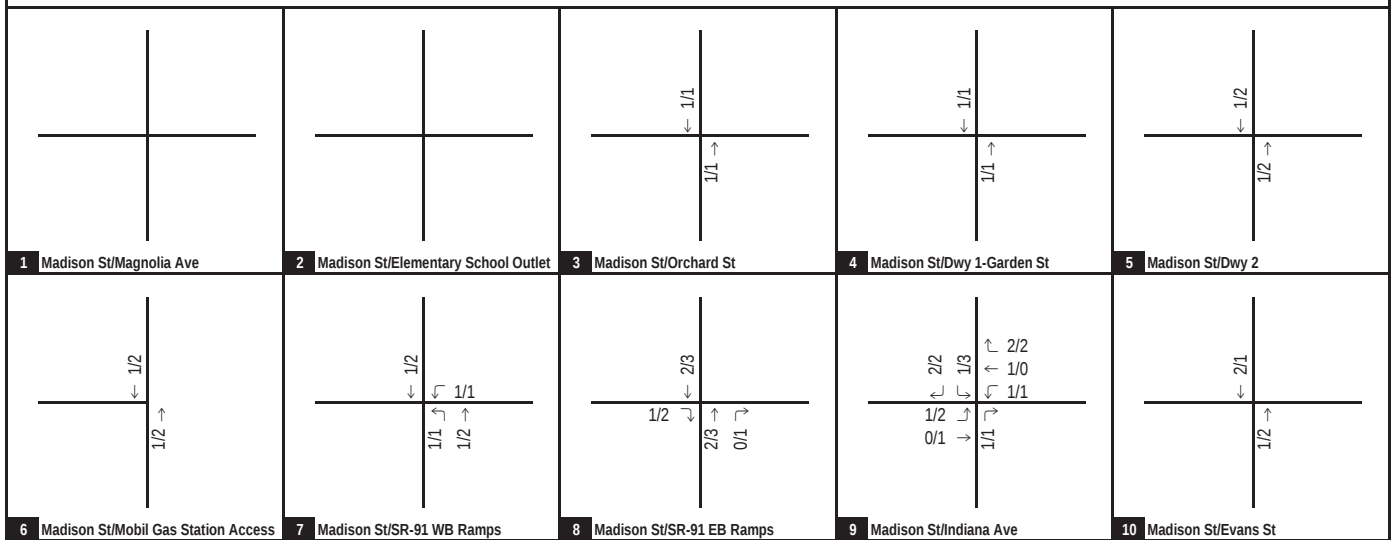
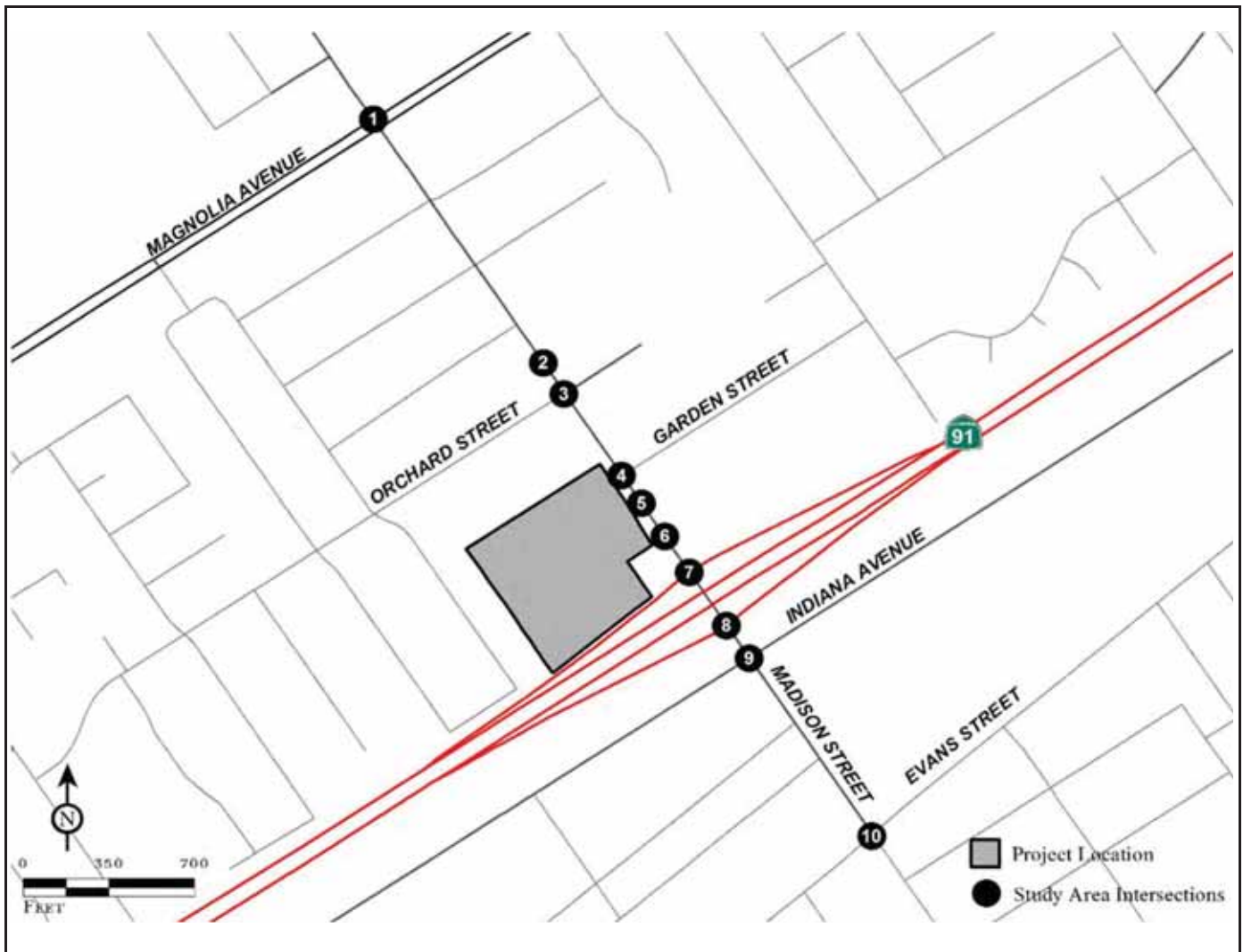
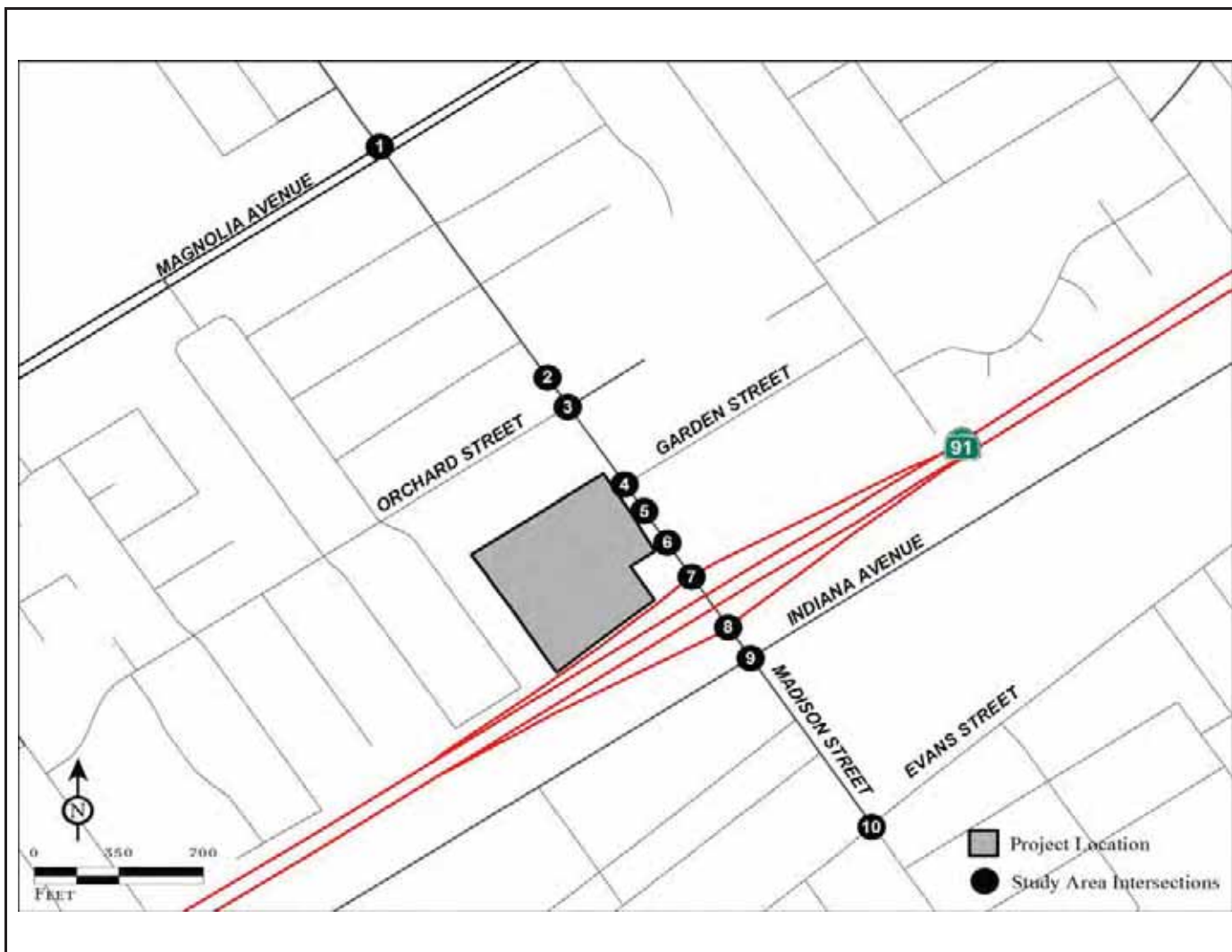


FIGURE 7

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X/Y AM/PM Peak Hour Trips

Madison Plaza
Traffic Impact Analysis
Cumulative Projects Trip Assignment



175 / 88 453 / 460 48 / 38 54 / 39 475 / 645 138 / 253 149 / 94 824 / 702 138 / 166 121 / 97 427 / 357 146 / 114 1 Madison St/Magnolia Ave	720 / 806 83 / 26 0 / 1 121 / 32 0 / 1 0 / 1 575 / 571 575 / 571 2 Madison St/Elementary School Outlet	78 / 40 641 / 763 124 / 36 11 / 8 23 / 10 114 / 57 60 / 73 565 / 565 91 / 15 3 Madison St/Orchard St	18 / 20 712 / 751 44 / 86 12 / 19 1 / 6 7 / 7 15 / 38 624 / 594 44 / 48 4 Madison St/Dwy 1-Garden St	13 / 31 765 / 849 8 / 23 2 / 2 19 / 36 41 / 27 677 / 647 21 / 48 5 Madison St/Dwy 2
1 / 6 789 / 896 33 / 27 739 / 721 6 Madison St/Mobil Gas Station Access	289 / 262 533 / 660 228 / 181 4 / 1 318 / 213 304 / 266 511 / 541 7 Madison St/SR-91 WB Ramps	607 / 672 245 / 201 88 / 122 22 / 3 80 / 149 727 / 684 376 / 405 8 Madison St/SR-91 EB Ramps	170 / 92 285 / 501 221 / 228 216 / 280 782 / 563 37 / 87 36 / 60 582 / 483 40 / 42 9 Madison St/Indiana Ave	24 / 34 265 / 528 21 / 67 37 / 39 9 / 5 26 / 31 13 / 27 570 / 452 8 / 15 10 Madison St/Evans St

LSA

FIGURE 8

xxx / yyy AM / PM Peak Hour Traffic Volumes (in PCEs)

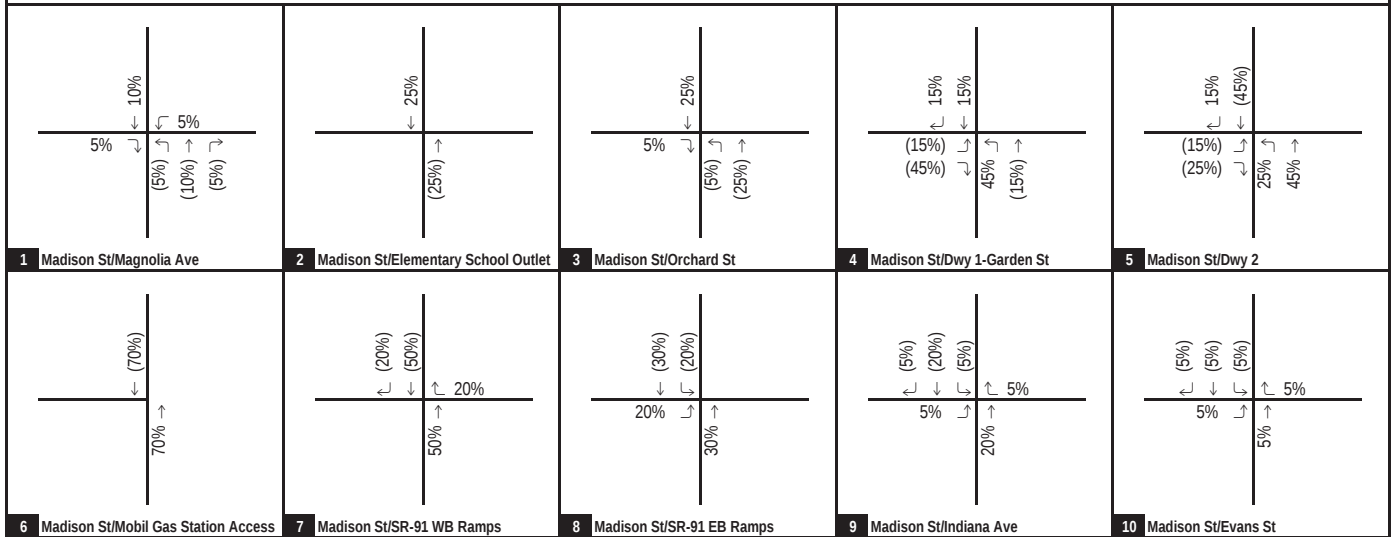
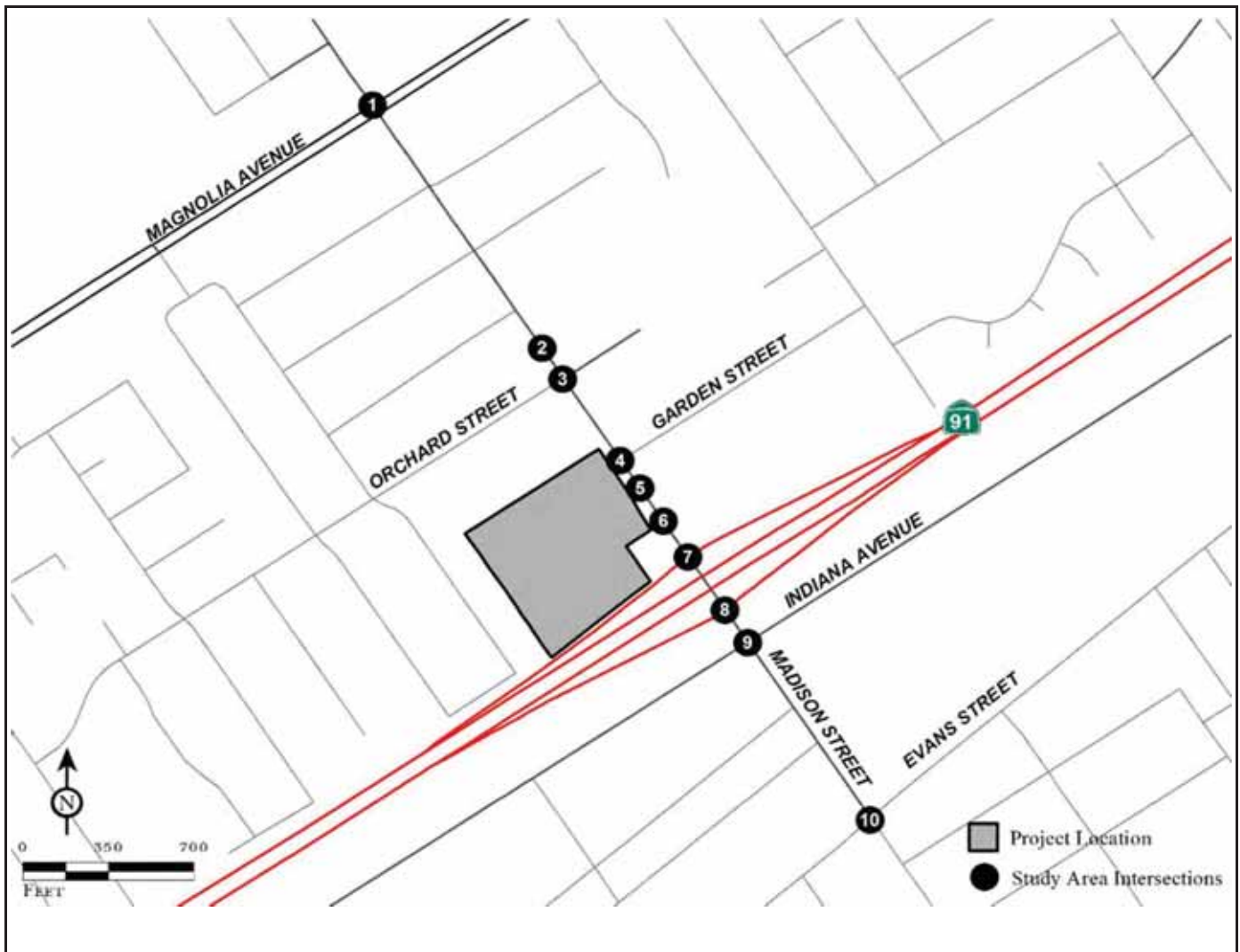
Madison Plaza
Traffic Impact Study
Cumulative (2017) Peak Hour Traffic Volumes (in PCEs)

Table D - Project Trip Generation

Land Uses	Units	A.M. Peak Hour			P.M. Peak Hour			Daily
		In	Out	Total	In	Out	Total	
Major B Market¹								
Trips/Unit		2.11	1.29	3.40	4.83	4.65	9.48	102.24
Trip Generation	41.117 TSF	87	53	140	199	191	390	4,204
Pass By Trips ²					(70)	(70)	(140)	(140)
Net New Trips		87	53	140	129	121	250	4,064
Major A Health Club³								
Trips/Unit		0.71	0.71	1.41	2.01	1.52	3.53	32.93
Proposed Trip Generation	37.849 TSF	27	27	54	76	57	133	1,247
PAD 1 Drive-Thru Restaurant⁴								
Trips/Unit		23.16	22.26	45.42	16.98	15.67	32.65	496.12
Trip Generation	1.950 TSF	45	43	88	33	31	64	968
Pass By Trips ⁵		(22)	(22)	(43)	(16)	(16)	(32)	(75)
Net New Trips		23	21	45	17	15	32	893
PAD 2 Retail/Restaurants		Existing Denny's Restaurant trips already exist and have not been accounted for in the project trip generation.						
Trip Generation	3.943 TSF							
Total Gross New Trips		159	123	282	308	279	587	6,419
Total Pass-By Trips		(22)	(22)	(43)	(86)	(86)	(172)	(215)
Total Net New Trips		138	102	239	222	193	415	6,204

TSF = thousand square feet

¹ Rates are based on Land Use 850 - "Supermarket" from *Institute of Transportation Engineers (ITE) Trip Generation (9th Edition)*.² Pass-by rates are based on Land Use 850 - "Supermarket" from *ITE Trip Generation Handbook, 2nd Edition*. During the a.m. peak hour pass-by trips are nominal for supermarket uses and therefore no pass-by credit was taken during the a.m. peak hour. Since no daily pass-by rates are provided in the *ITE Trip Generation manual*, therefore, p.m. pass-by trips were used for daily pass-by trips as a conservative approach.³ Rates are based on Land Use 492 - "Health/Fitness Club" from *ITE Trip Generation (9th Edition)*.⁴ Rates are based on Land Use 934 - "Fast-Food Restaurant with Drive-Through Window" from *ITE Trip Generation (9th Edition)*.⁵ Pass-by rates are based on Land Use 934 - "Fast-Food Restaurant with Drive-Through Window" from *ITE Trip Generation Handbook, 2nd Edition*.



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FIGURE 9

XX%(YY%) Inbound%(Outbound%) Trip Distribution

Madison Plaza
Traffic Impact Analysis
Project Trip Distribution

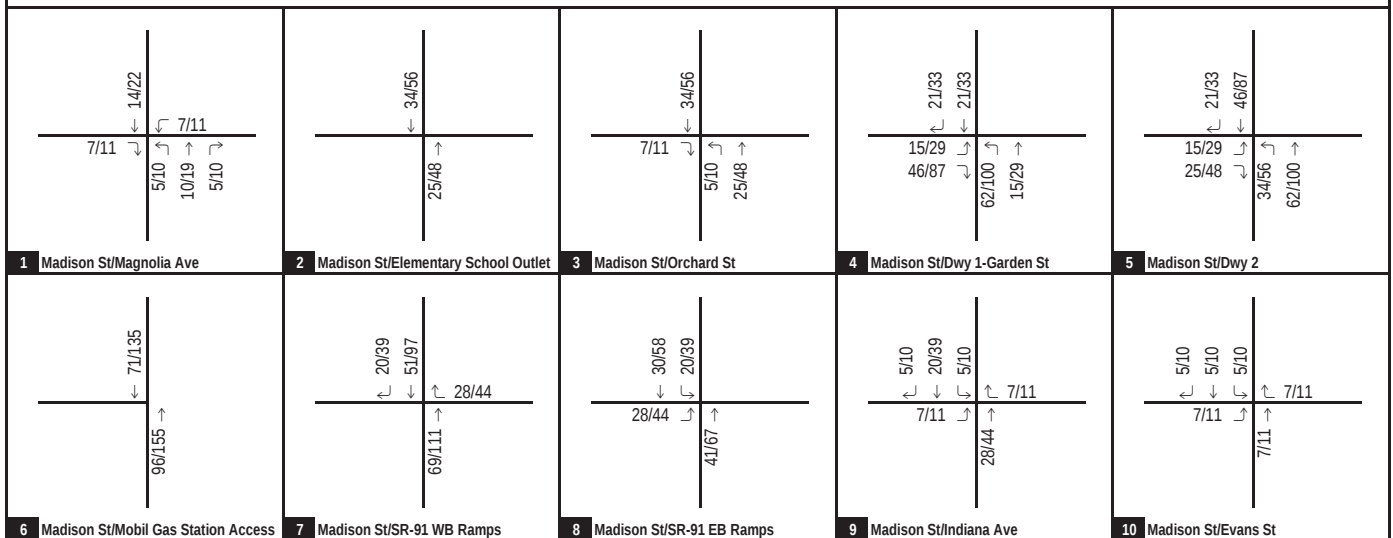
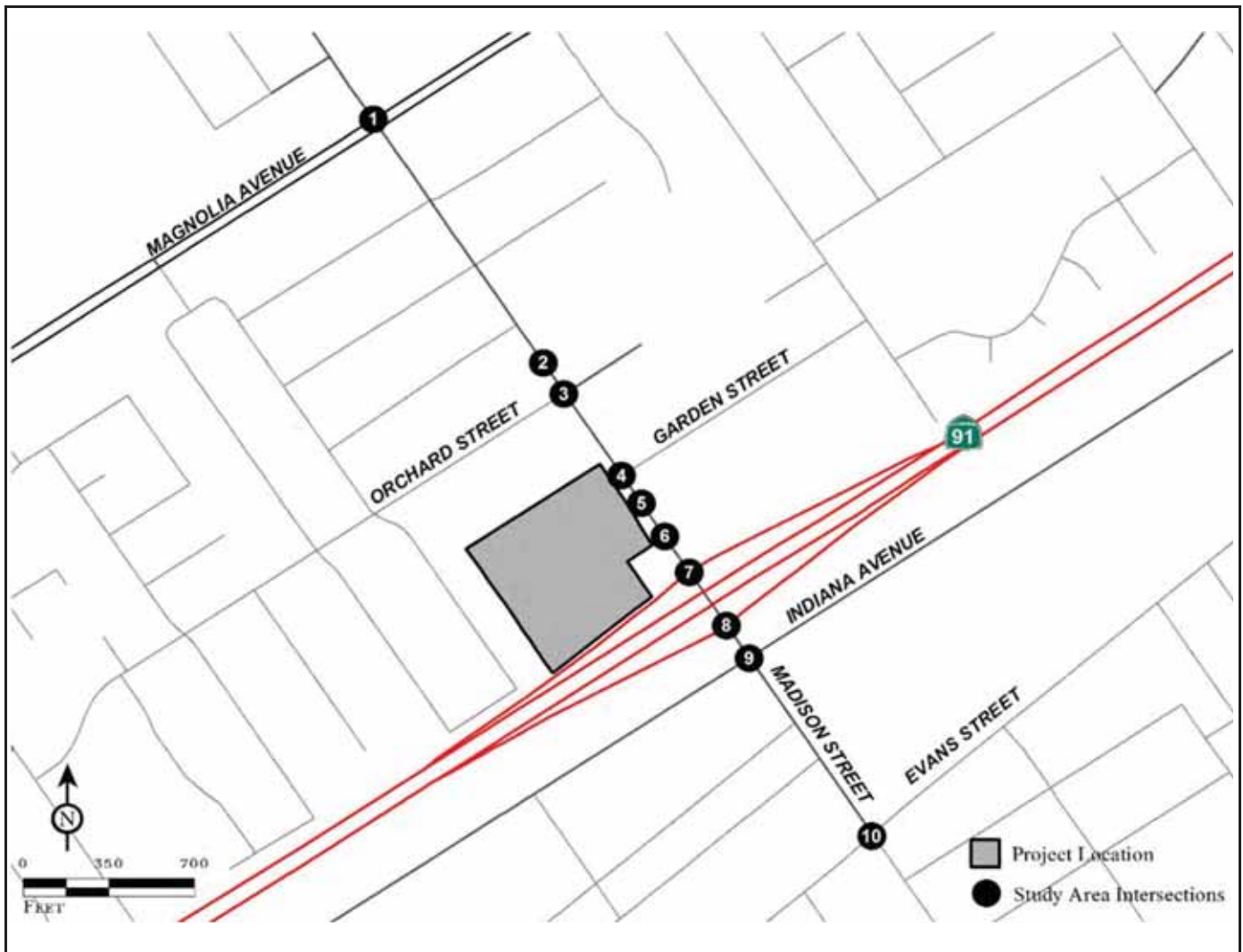
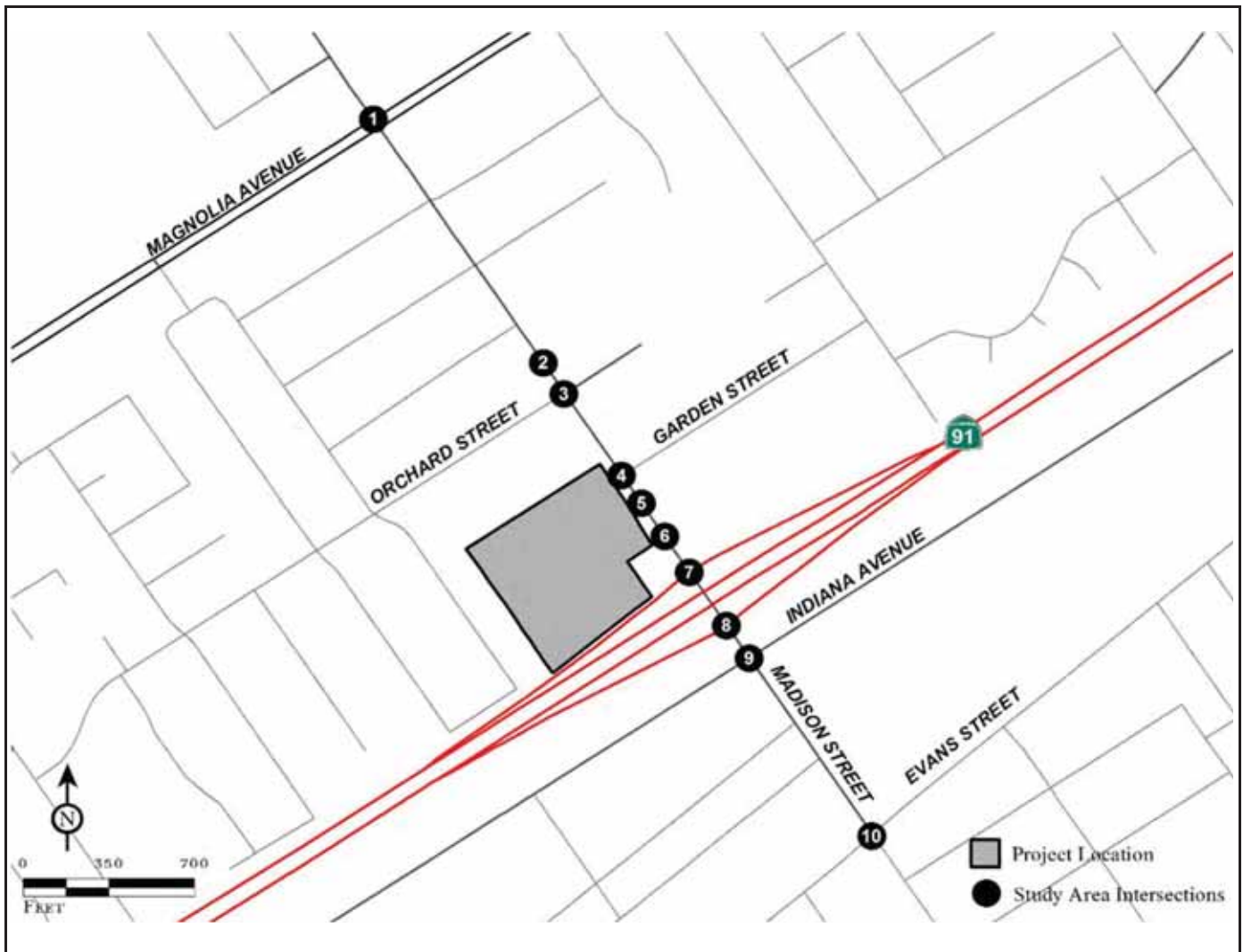


FIGURE 10

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XX/YY AM/PM Peak Hour Trips

Madison Plaza
Traffic Impact Analysis
Project Trip Assignment



1	Madison St/Magnolia Ave	2	Madison St/Elementary School Outlet	3	Madison St/Orchard St	4	Madison St/Dwy 1-Garden St	5	Madison St/Dwy 2
6	Madison St/Mobil Gas Station Access	7	Madison St/SR-91 WB Ramps	8	Madison St/SR-91 EB Ramps	9	Madison St/Indiana Ave	10	Madison St/Evans St

LSA

FIGURE 11

XX/YY AM/PM Peak Hour Trips

Madison Plaza
Traffic Impact Analysis
Project Pass-By Trip Assignment

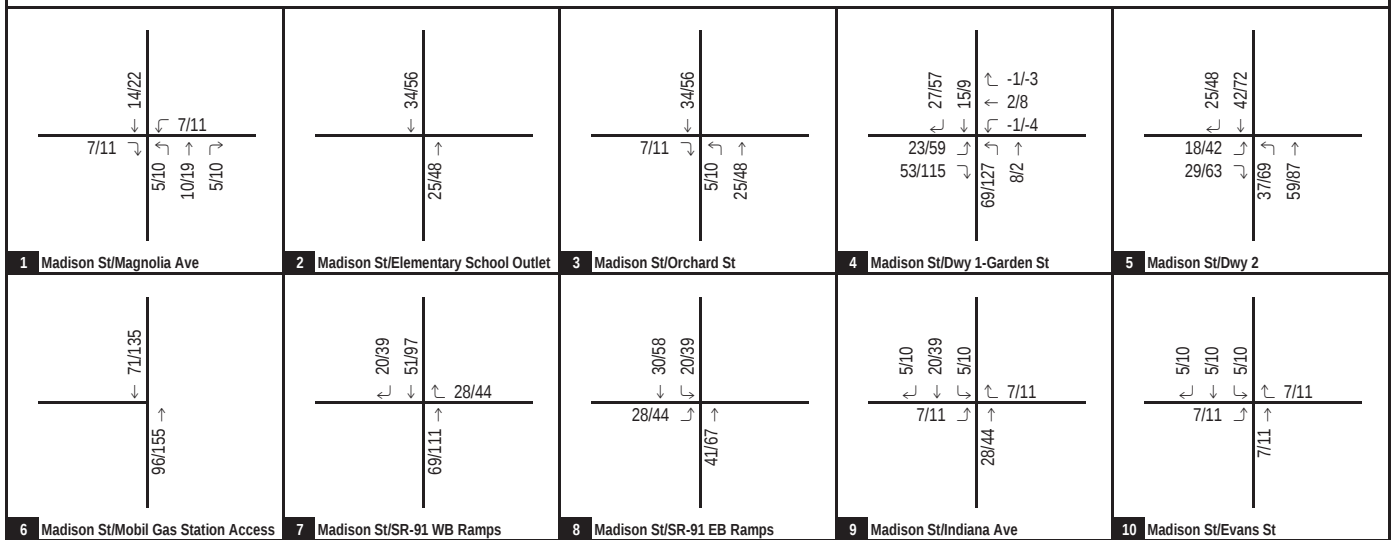
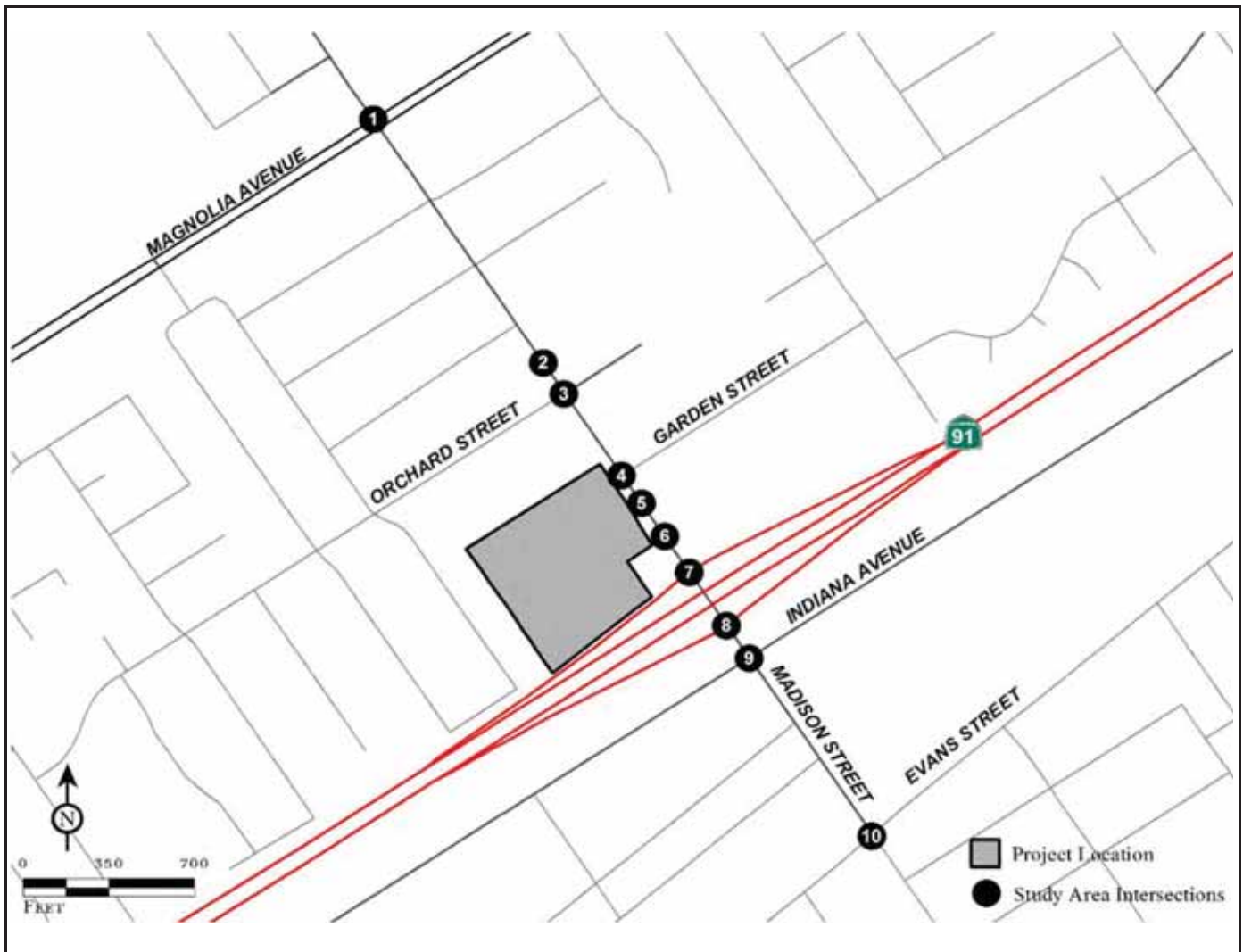
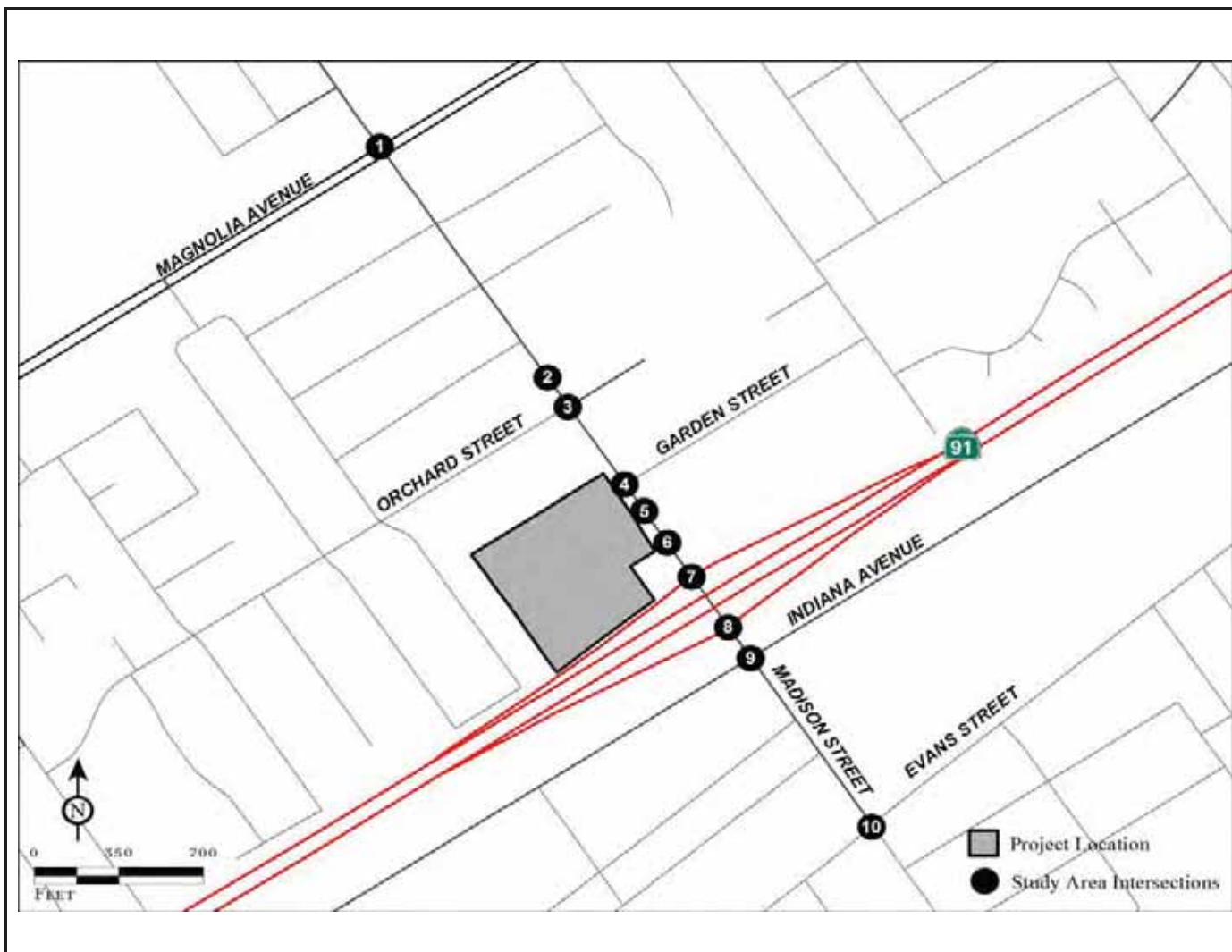


FIGURE 12

LSA

xxx/yyy AM/PM Peak Hour Trips

Madison Plaza
Traffic Impact Analysis
Total Net Project Trip Assignment



172 / 86 458 / 473 47 / 37 53 / 38 466 / 632 142 / 259 146 / 92 808 / 688 142 / 174 124 / 105 429 / 369 148 / 122 1 Madison St/Magnolia Ave	740 / 846 81 / 25 0 / 1 119 / 31 0 / 1 0 / 1 589 / 608 2 Madison St/Elementary School Outlet	76 / 39 661 / 803 122 / 35 11 / 8 23 / 10 119 / 67 64 / 82 578 / 601 89 / 15 3 Madison St/Orchard St	45 / 77 712 / 744 43 / 84 60 / 60 2 / 9 65 / 137 35 / 78 1 / 6 60 / 122 84 / 164 619 / 583 43 / 47 4 Madison St/Dwy 1-Garden St	38 / 78 791 / 902 8 / 23 4 / 31 0 / 1 6 / 17 20 / 44 48 / 98 77 / 95 722 / 719 21 / 47 5 Madison St/Dwy 2
1 / 6 844 / 1011 32 / 26 820 / 860 6 Madison St/Mobil Gas Station Access	303 / 296 573 / 742 252 / 221 4 / 1 311 / 208 297 / 260 589 / 639 7 Madison St/SR-91 WB Ramps	623 / 714 260 / 236 114 / 164 22 / 3 77 / 144 752 / 735 369 / 396 8 Madison St/SR-91 EB Ramps	170 / 98 309 / 530 221 / 231 306 / 328 156 / 231 21 / 59 218 / 284 767 / 551 36 / 85 35 / 59 599 / 518 38 / 40 9 Madison St/Indiana Ave	29 / 43 263 / 527 26 / 76 65 / 58 9 / 3 2 / 4 43 / 49 9 / 5 25 / 30 13 / 26 565 / 452 8 / 15 10 Madison St/Evans St

LSA

FIGURE 13

xxx / yyy AM / PM Peak Hour Traffic Volumes (in PCEs)

Madison Plaza
Traffic Impact Study
Existing With Project Peak Hour Traffic Volumes (in PCEs)

project peak hour traffic volumes. Figure 14 illustrates the project completion (2017) with project peak hour traffic volumes. Figure 15 illustrates the cumulative (2017) with project peak hour traffic volumes.

LEVELS OF SERVICE

Without Project Levels of Service

Figure 16 illustrates the existing study area intersection geometrics. Existing, project completion (2017), and cumulative (2017) traffic volumes were developed using the approach discussed in the traffic forecast section of this report. Intersection level of service analyses were conducted for existing, project completion (2017), and cumulative (2017) conditions to determine current and projected intersection performance. LOS worksheets are included in Appendix D. Tables E, F, and G summarize the results of these analyses and show that all study area intersections are projected to operate at satisfactory levels of service with the exception of the following:

- Madison Street/Evans Street (p.m. peak hour).

With Project Levels of Service

Existing, project completion (2017), and cumulative (2017) with project traffic volumes were developed using the approach discussed in the traffic forecast section of this report. Intersection level of service analyses were conducted for existing, project completion (2017), and cumulative (2017) with project conditions to determine the projected intersection performance. Tables E, F, and G summarize the results of these analyses and show that all study area intersections are projected to operate at satisfactory levels of service with the exception of the following:

- Madison Street/Driveway 2 (a.m. and p.m. peak hours); and
- Madison Street/Evans Street (p.m. peak hour).

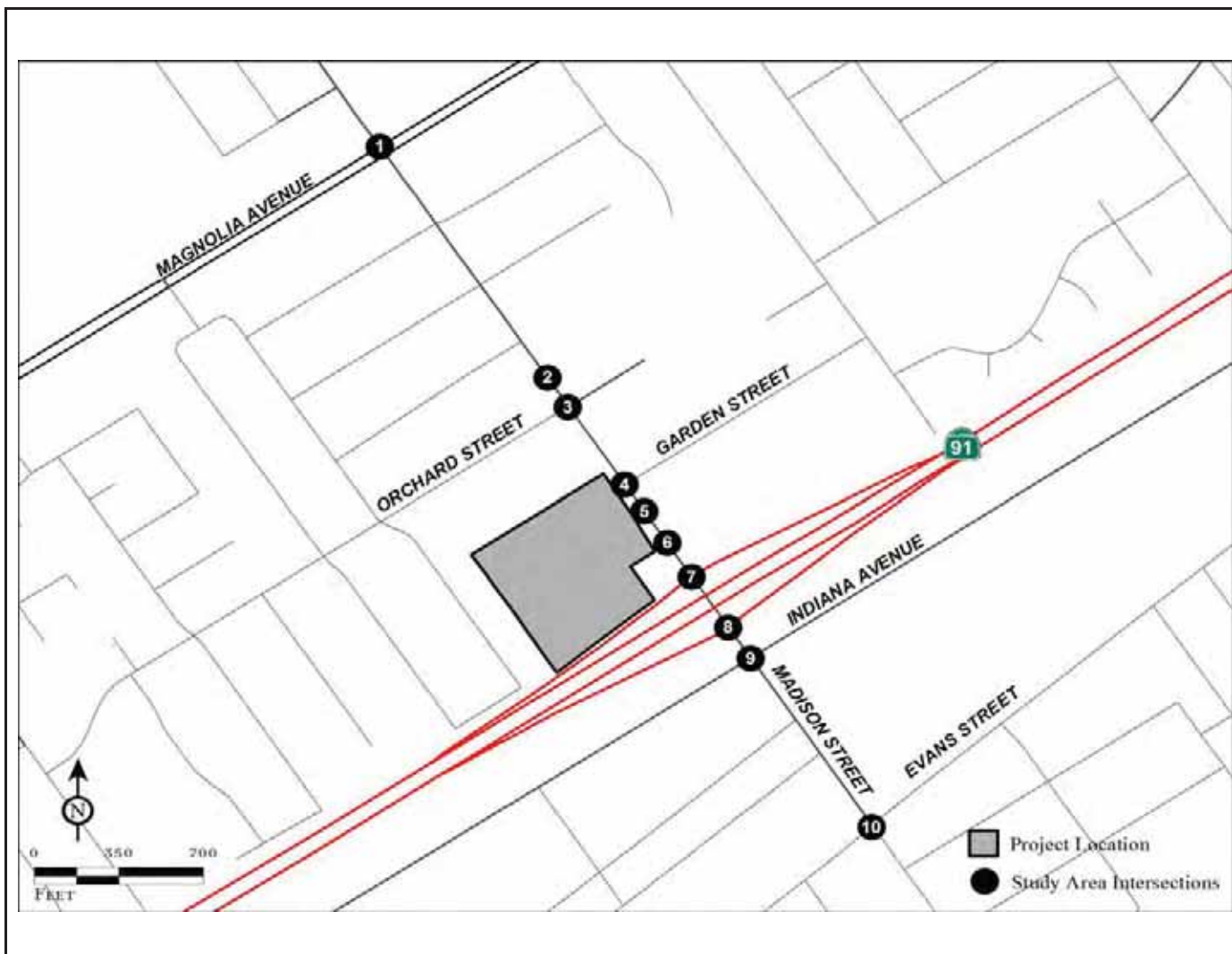
CIRCULATION IMPROVEMENTS AND RECOMMENDATIONS

At intersections where the level of service is forecast to be unsatisfactory or where the project would have an impact, the City requires that improvements be identified to maintain conformance with City level of service standards or pre-project level of service conditions. Therefore, the following improvements have been recommended.

Existing, Project Completion (2017), and Cumulative (2017) With Project Levels of Service

- Madison Street/Driveway 2: Restrict from full-access driveway to no eastbound left-out access by providing a half pork-chop island as illustrated in Figure 3. This recommendation improves the eastbound LOS, and mitigates the projects cumulative impact. However, due to the westbound movements the intersection will continue to operate at unsatisfactory LOS. A striping plan for the project frontage is included in Appendix E and shows the recommended driveway configuration.
- Madison Street/Evans Street: Install appropriate signage to restrict eastbound left-turn movements under p.m. peak hour. The signage will be implemented by the City at its own discretion.

Figure 17 illustrates the study intersection geometrics with the recommended improvements and Tables H, I, and J summarize the intersection levels of service with the recommended improvements



175 / 88 467 / 482 48 / 38 54 / 39 475 / 645 145 / 264 149 / 94 824 / 702 145 / 177 126 / 107 437 / 376 151 / 124	754 / 862 83 / 26 0 / 1 121 / 32 0 / 1 600 / 619	78 / 40 674 / 818 124 / 36 11 / 8 23 / 10 121 / 68 65 / 83 589 / 612 91 / 15	45 / 77 726 / 759 44 / 86 61 / 61 2 / 9 66 / 140 35 / 78 1 / 6 60 / 122 84 / 165 631 / 595 44 / 48	38 / 79 806 / 919 8 / 23 4 / 32 0 / 1 6 / 17 20 / 44 48 / 99 78 / 96 735 / 732 21 / 48
1 Madison St/Magnolia Ave	2 Madison St/Elementary School Outlet	3 Madison St/Orchard St	4 Madison St/Dwy 1-Garden St	5 Madison St/Dwy 2
1 / 6 859 / 1029 33 / 27 834 / 874	309 / 301 583 / 755 256 / 225 4 / 1 317 / 212 303 / 265 579 / 650	635 / 727 265 / 240 116 / 166 22 / 3 79 / 147 766 / 748 376 / 404	173 / 100 315 / 540 225 / 235 312 / 334 159 / 236 21 / 60 222 / 289 782 / 562 37 / 87 36 / 60 610 / 527 39 / 41	29 / 44 268 / 537 26 / 77 66 / 59 9 / 3 2 / 4 44 / 50 9 / 5 26 / 31 13 / 27 576 / 461 8 / 15
6 Madison St/Mobil Gas Station Access	7 Madison St/SR-91 WB Ramps	8 Madison St/SR-91 EB Ramps	9 Madison St/Indiana Ave	10 Madison St/Evans St

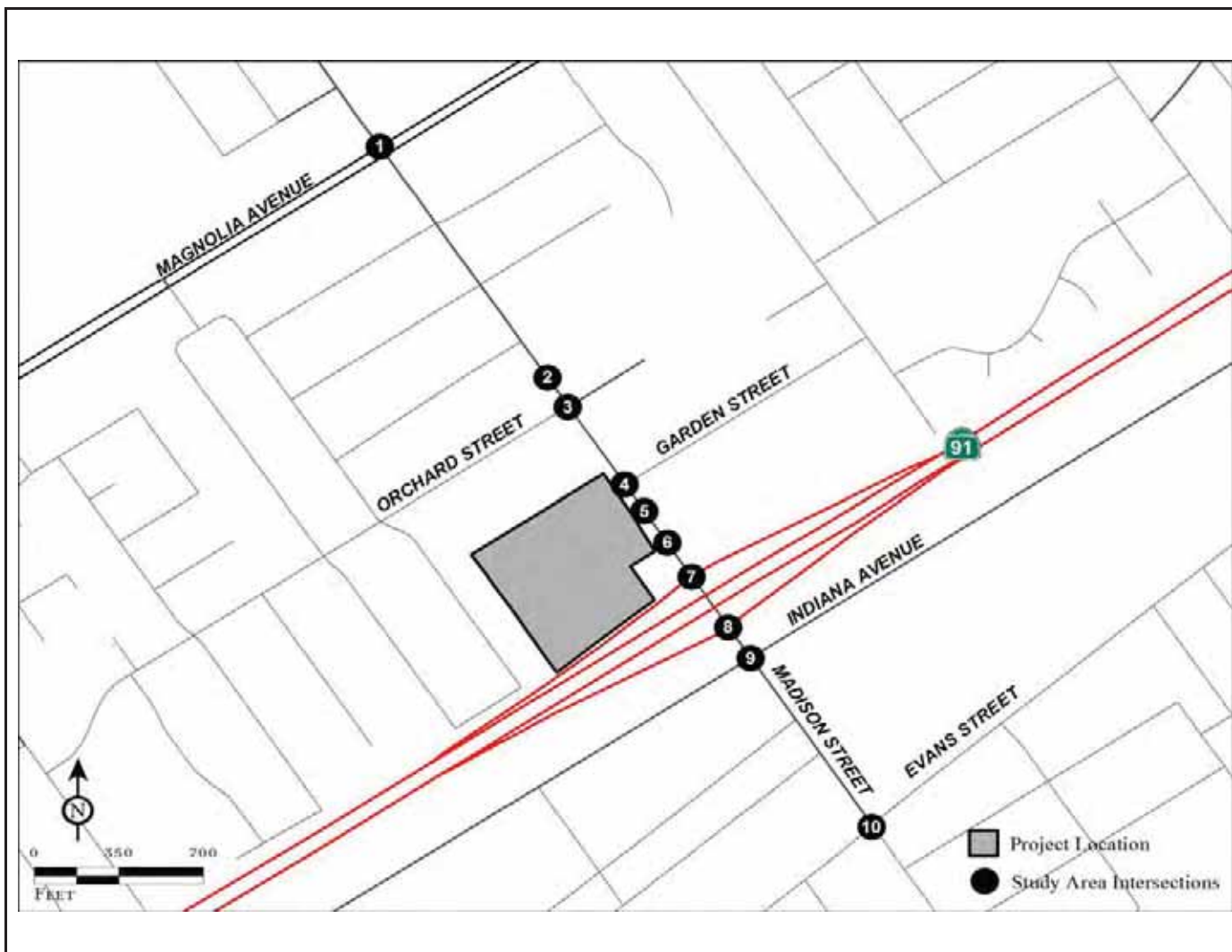
FIGURE 14

LSA

xxx / yyy AM / PM Peak Hour Traffic Volumes (in PCEs)

Madison Plaza
Traffic Impact Study

Project Completion (2017) With Project Peak Hour Traffic Volumes (in PCEs)



175 / 88 467 / 482 48 / 38 54 / 39 475 / 645 145 / 264 149 / 94 824 / 702 145 / 177 126 / 107 437 / 376 151 / 124	754 / 862 83 / 26 0 / 1 121 / 32 0 / 1 600 / 619	78 / 40 675 / 819 124 / 36 11 / 8 23 / 10 121 / 68 65 / 83 590 / 613 91 / 15	45 / 77 727 / 760 44 / 86 61 / 61 2 / 9 66 / 140 35 / 78 1 / 6 60 / 122 84 / 165 632 / 596 44 / 48	38 / 79 807 / 921 8 / 23 4 / 32 0 / 1 6 / 17 20 / 44 48 / 99 78 / 96 736 / 734 21 / 48
1 Madison St/Magnolia Ave	2 Madison St/Elementary School Outlet	3 Madison St/Orchard St	4 Madison St/Dwy 1-Garden St	5 Madison St/Dwy 2
1 / 6 860 / 1031 33 / 27 835 / 876	309 / 301 584 / 757 256 / 225 4 / 1 318 / 213 304 / 266 580 / 652	637 / 730 265 / 240 116 / 166 22 / 3 80 / 149 768 / 751 376 / 405	175 / 102 315 / 540 226 / 238 314 / 336 160 / 236 22 / 61 223 / 291 782 / 563 37 / 87 36 / 60 610 / 527 40 / 42	29 / 44 270 / 538 26 / 77 66 / 59 9 / 3 2 / 4 44 / 50 9 / 5 26 / 31 13 / 27 577 / 463 8 / 15
6 Madison St/Mobil Gas Station Access	7 Madison St/SR-91 WB Ramps	8 Madison St/SR-91 EB Ramps	9 Madison St/Indiana Ave	10 Madison St/Evans St

LSA

FIGURE 15

xxx / yyy AM / PM Peak Hour Traffic Volumes (in PCEs)

Madison Plaza
Traffic Impact Study
Cumulative (2017) With Project Peak Hour Traffic Volumes (in PCEs)

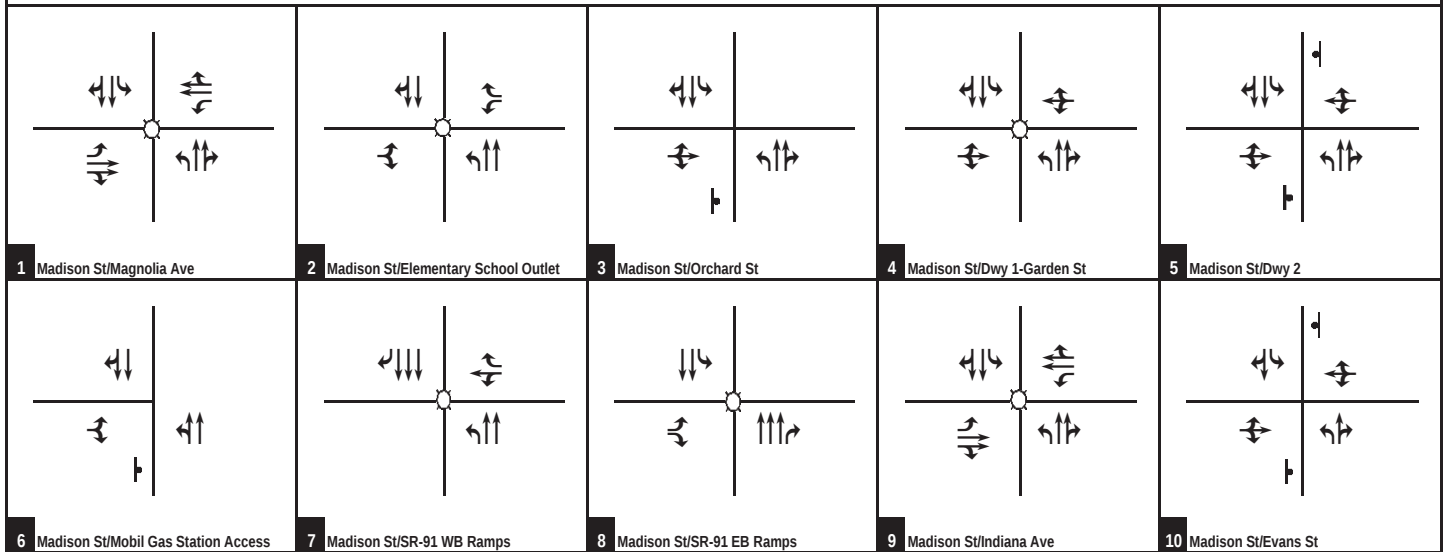
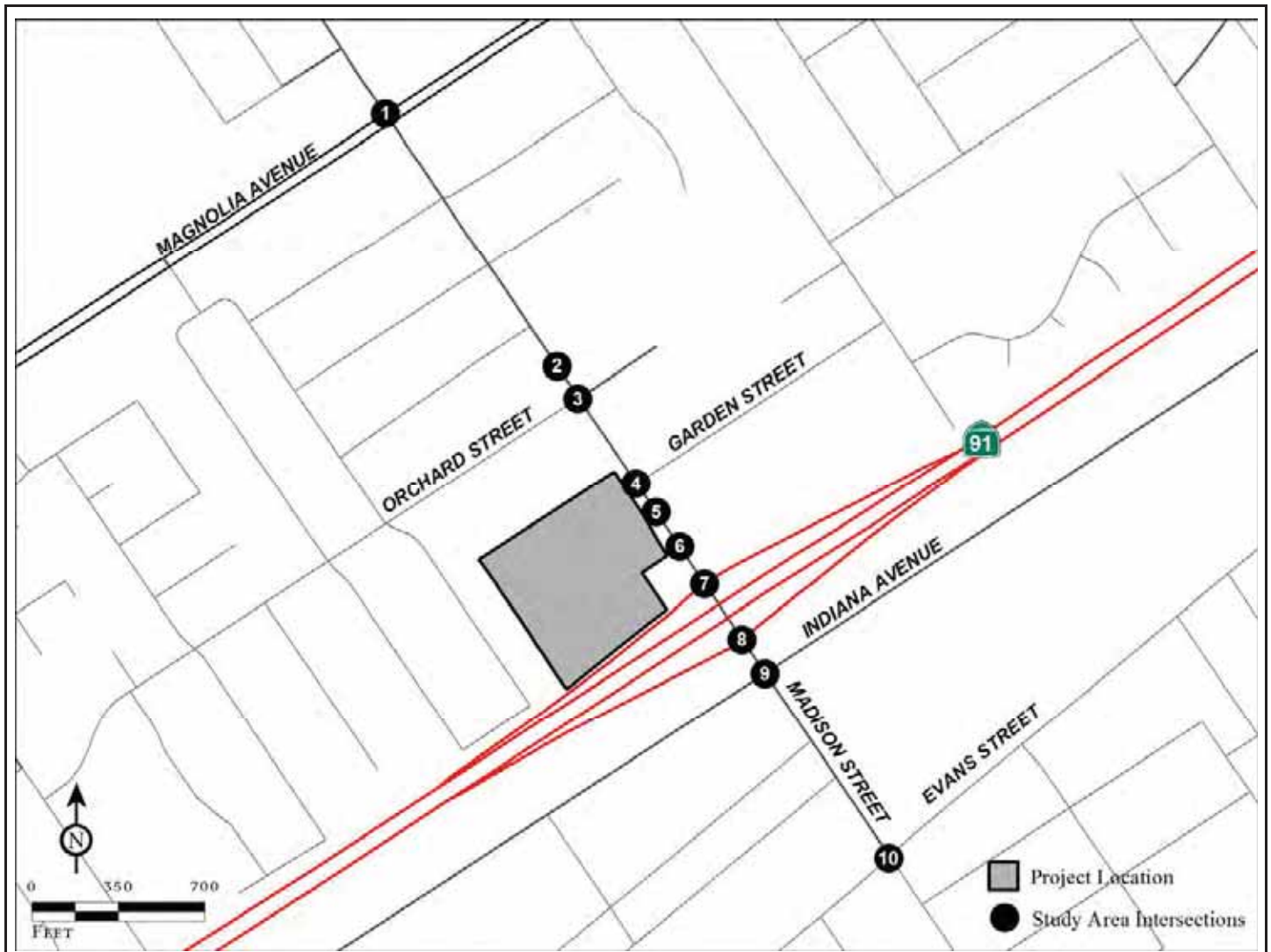


FIGURE 16

LSA

Legend
 □ Signal
 — Stop Sign

Madison Plaza
 Traffic Impact Analysis
 Existing Intersection Geometrics and Stop Control

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Exhibit 9 - Initial Study

Table E - Existing Intersection Levels of Service

Intersection	Control	Without Project			With Project		
		A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour
		Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS
1 . Madison Street/Magnolia Avenue	Signal	41.3	D	37.7	D	42.9	D
2 . Madison Street/Elementary School Outlet	Signal	3.6	A	1.7	A	3.5	A
3 . Madison Street/Orchard Street	TWSC	18.6	C	14.9	B	20.5	C
4 . Madison Street/Driveway 1-Garden Street	Signal	6.3	A	10.5	B	11.7	B
5 . Madison Street/Driveway 2	TWSC	27.4	D	23.6	C	38.0	E *
6 . Madison Street/Mobil Gas Station Access	TWSC	12.8	B	13.4	B	13.3	B
7 . Madison Street/SR-91 Westbound Ramps	Signal	23.6	C	16.9	B	24.4	C
8 . Madison Street/SR-91 Eastbound Ramps	Signal	16.4	B	16.8	B	17.2	B
9 . Madison Street/Indiana Avenue	Signal	32.7	C	35.2	D	33.6	C
10 . Madison Street/Evans Street	TWSC	24.6	C	35.5	E	28.7	D
							F *

Notes:

TWSC = Two-Way Stop Control

Delay = Average control delay in seconds (For TWSC intersections, reported delay is for worst-case movement).

LOS = Level of Service

* Exceeds LOS Standard

Table F - Project Completion Intersection Levels of Service

Intersection	Control	Without Project			With Project		
		A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour
		Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS
1 . Madison Street/Magnolia Avenue	Signal	43.5	D	39.0	D	45.4	D
2 . Madison Street/Elementary School Outlet	Signal	3.6	A	1.7	A	3.5	A
3 . Madison Street/Orchard Street	TWSC	19.4	C	15.2	C	21.4	C
4 . Madison Street/Driveway 1-Garden Street	Signal	6.3	A	13.7	B	11.7	B
5 . Madison Street/Driveway 2	TWSC	28.4	D	24.4	C	40.0	E
6 . Madison Street/Mobil Gas Station Access	TWSC	12.9	B	13.6	B	13.4	B
7 . Madison Street/SR-91 Westbound Ramps	Signal	23.9	C	17.0	B	24.7	C
8 . Madison Street/SR-91 Eastbound Ramps	Signal	16.6	B	16.9	B	17.4	B
9 . Madison Street/Indiana Avenue	Signal	33.3	C	37.1	D	34.5	C
10 . Madison Street/Evans Street	TWSC	25.6	D	38.3	E	30.0	D

Notes:

TWSC = Two-Way Stop Control

Delay = Average control delay in seconds (For TWSC intersections, reported delay is for worst-case movement).

LOS = Level of Service

* Exceeds LOS Standard

Table G - Cumulative Intersection Levels of Service

Intersection	Control	Without Project			With Project		
		A.M. Peak Hour	P.M. Peak Hour	Delay (sec.)	A.M. Peak Hour	P.M. Peak Hour	Delay (sec.)
		Delay (sec.)	LOS		Delay (sec.)	LOS	
1 . Madison Street/Magnolia Avenue	Signal	43.5	D	39.0	45.4	D	40.7
2 . Madison Street/Elementary School Outlet	Signal	3.6	A	1.7	3.5	A	1.7
3 . Madison Street/Orchard Street	TWSC	19.4	C	15.2	21.4	C	16.4
4 . Madison Street/Driveway 1-Garden Street	Signal	6.3	A	13.7	11.7	B	17.4
5 . Madison Street/Driveway 2	TWSC	28.5	D	24.4	40.0	E	157.5
6 . Madison Street/Mobil Gas Station Access	TWSC	12.9	B	13.6	13.4	B	14.7
7 . Madison Street/SR-91 Westbound Ramps	Signal	23.9	C	17.0	24.7	C	17.4
8 . Madison Street/SR-91 Eastbound Ramps	Signal	16.6	B	16.9	17.4	B	18.0
9 . Madison Street/Indiana Avenue	Signal	33.5	C	37.6	34.7	C	40.4
10 . Madison Street/Evans Street	TWSC	25.6	D	38.3	30.2	D	54.7
				E			F

Notes:

TWSC = Two-Way Stop Control

Delay = Average control delay in seconds (For TWSC intersections, reported delay is for worst-case movement).

LOS = Level of Service

* Exceeds LOS Standard

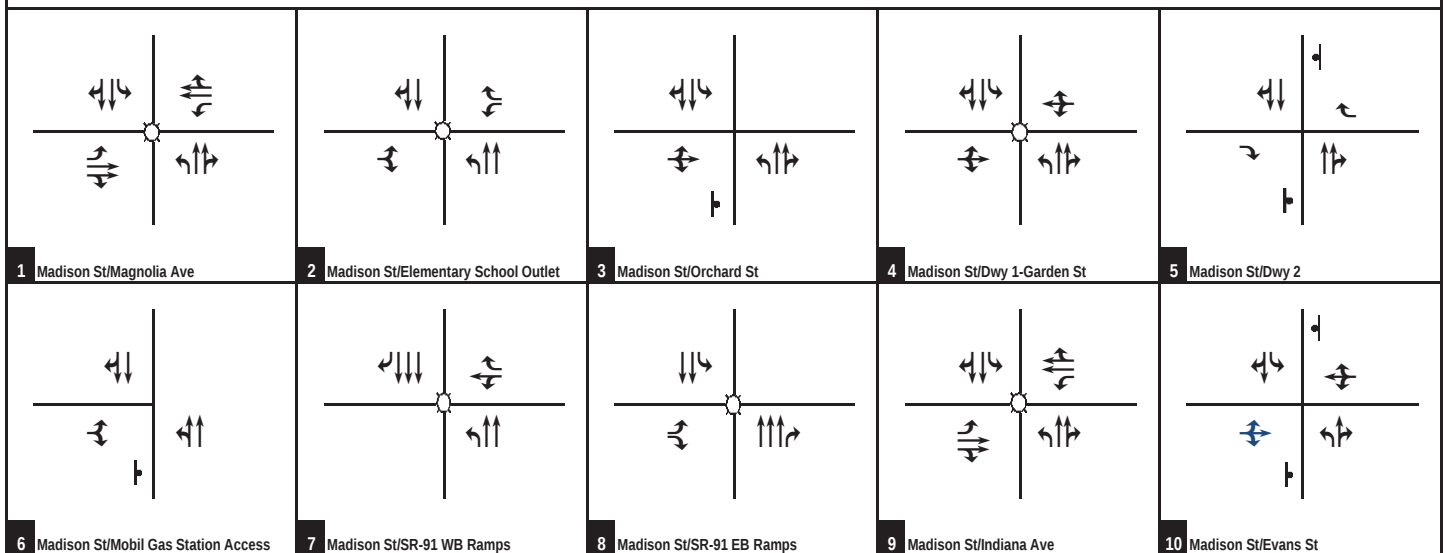
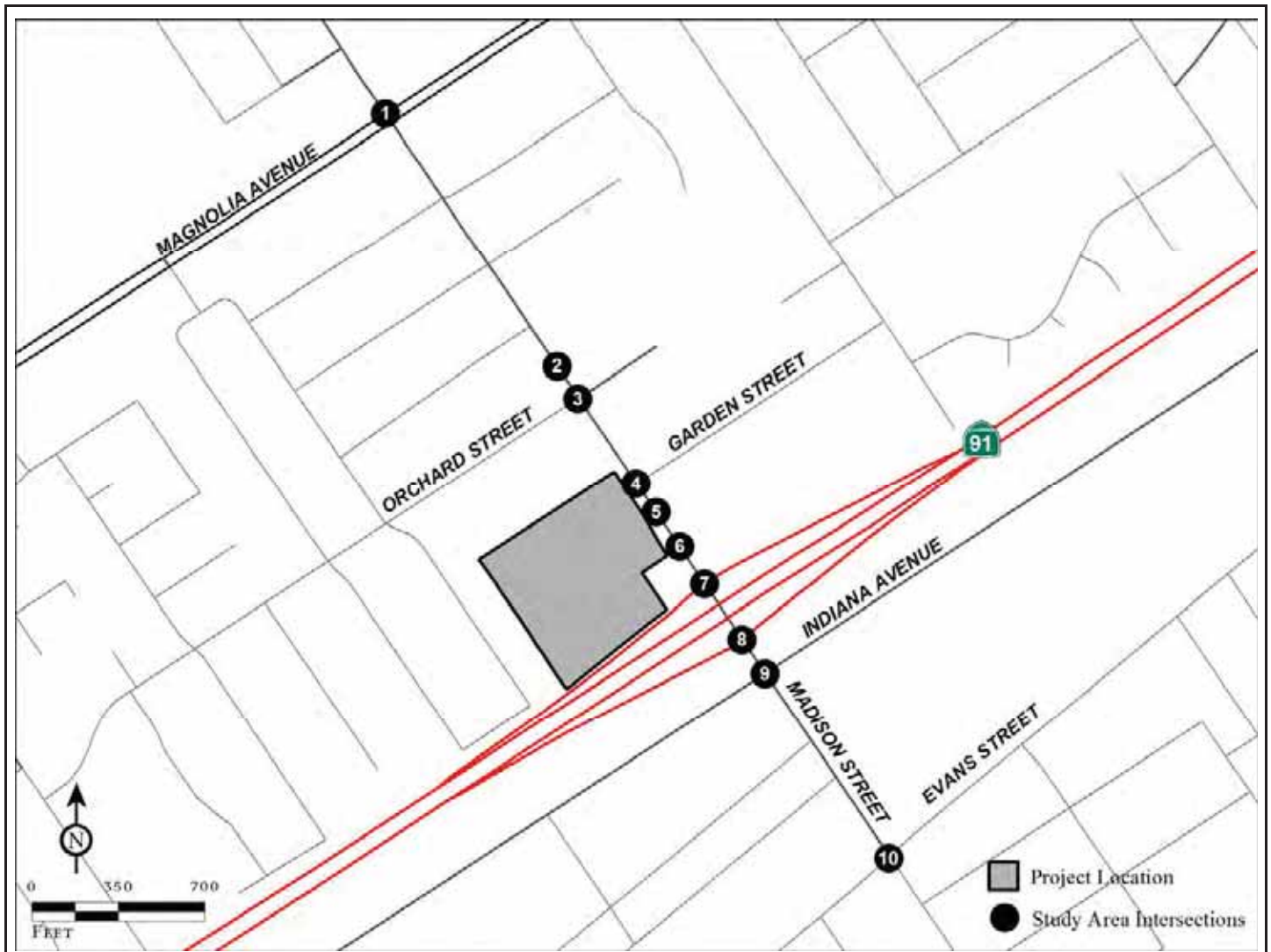


FIGURE 17

LSA

- Legend
- Signal
 - Stop Sign
 - Improvements
 - Eastbound Left-Turn Restricted in PM Peak Hour

Madison Plaza
Traffic Impact Analysis

Existing, Project Completion (2017), and Cumulative
(2017) With Project With Improvements Intersection Geometrics and Stop Control

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Table H - Existing With Improvements Intersection Levels of Service

Intersection	With Project				With Project With Improvements			
	Control	A.M. Peak Hour		P.M. Peak Hour	Control	A.M. Peak Hour		P.M. Peak Hour
		Delay (sec.)	LOS			Delay (sec.)	LOS	
4 . Madison Street/Driveway 1-Garden Street	Signal TWSC (Full Access) TWSC	11.7	B	15.9	Signal TWSC (No Left-out from Project Driveway) TWSC	11.8	B	16.3
5 . Madison Street/Driveway 2		38.0	E *	139.2		38.0	E *	46.8
10 . Madison Street/Evans Street		28.7	D	50.1		28.7	D	15.3

Notes:

TWSC = Two-Way Stop Control

Delay = Average control delay in seconds (For TWSC intersections, reported delay is for worst-case movement).

LOS = Level of Service

* Exceeds LOS Standard

Table I - Project Completion With Improvements Intersection Levels of Service

Intersection	With Project				With Project With Improvements			
	Control	A.M. Peak Hour		P.M. Peak Hour	Control	A.M. Peak Hour		P.M. Peak Hour
		Delay (sec.)	LOS			Delay (sec.)	LOS	
4 . Madison Street/Driveway 1-Garden Street	Signal	11.7	B	17.4	Signal	11.8	B	16.4
5 . Madison Street/Driveway 2	TWSC (Full Access)	40.0	E *	157.5	TWSC (No Left-out from Project Driveway)	40.0	E *	49.3
10 . Madison Street/Evans Street	TWSC	30.0	D	54.7	TWSC	30.0	D	15.6

Notes:

TWSC = Two-Way Stop Control

Delay = Average control delay in seconds (For TWSC intersections, reported delay is for worst-case movement).

LOS = Level of Service

* Exceeds LOS Standard

Table J - Cumulative With Improvements Intersection Levels of Service

Intersection	With Project				With Project With Improvements			
	Control	A.M. Peak Hour		P.M. Peak Hour	Control	A.M. Peak Hour		P.M. Peak Hour
		Delay (sec.)	LOS			Delay (sec.)	LOS	
4 . Madison Street/Driveway 1-Garden Street	Signal TWSC (Full Access) TWSC	11.7	B	17.4	Signal TWSC (No Left-out from Project Driveway) TWSC	11.8	B	16.4
5 . Madison Street/Driveway 2		40.0	E *	157.5		40.0	E *	49.8
10 . Madison Street/Evans Street		30.2	D	54.7		30.2	D	15.7

Notes:

TWSC = Two-Way Stop Control

Delay = Average control delay in seconds (For TWSC intersections, reported delay is for worst-case movement).

LOS = Level of Service

* Exceeds LOS Standard

under existing, project completion (2017), and cumulative (2017) with project conditions, and shows that all study intersections would operate at satisfactory LOS with the implementation of the recommended improvements.

INTERNAL CIRCULATION AND PARKING

An internal circulation analysis for delivery trucks was conducted to evaluate the adequacy of truck turning paths for all truck turning movements within the project site. The truck turning radii are illustrated in previously referenced Figure 3, which shows that trucks will enter and exit the project site via Madison Street/Driveway 1-Garden Street. Upon entering the site, trucks will head toward the southern part of the project, then west to the rear of the market building, where they will unload, and the exit to the east at Driveway 1. Deliveries to the project would likely include semi-trailers; therefore, truck turning radii were verified using design vehicle WB-67 (73.5 feet in length) from AASHTO's *Geometric Design of Highways and Streets*, 2001, which shows that the turning radii provided in the current site plan are consistent with the requirements prescribed by AASHTO.

An off-street parking analysis was included to determine the number of parking spaces required to meet the City's parking requirements. The number of off-street parking spaces required by the project is based on rates from the City's Municipal Code 19.580. Table K shows the parking generation and indicates the parking requirement for the market component is 165 spaces, for the fast-food restaurant component is 20 spaces, for the Denny's component is 40 spaces, and for the health/fitness club component is 253 parking spaces. The total parking requirement is 478 spaces. A 15 percent parking credit was applied to the total parking requirement based on the City's Municipal Code for projects in close proximity to transit stops. After applying the 15 percent parking credit, the total number of parking spaces required is 406 spaces. The project provides a total of 432 parking spaces and therefore provides sufficient parking to meet the City's Municipal Code requirements.

CONGESTION MANAGEMENT PROGRAM ANALYSIS

The "2011 Riverside County Congestion Management Program" includes guidelines to more directly link land use, transportation, and air quality, thereby prompting reasonable growth management programs that will effectively utilize new transportation funds, alleviate traffic congestion and related impacts, and improve air quality. These guidelines establish a system of state highways and principal arterial roadways designated by the Riverside County Transportation Commission (RCTC). The adopted minimum Level of Service (LOS) threshold for CMP state highways and principal arterial roadways is LOS E, unless the intersection or segment had a lower LOS (LOS F) in 1991; these facilities are exempt from CMP deficiency plan requirements. Exhibit 4-1 in the CMP lists the exempt facilities, which include the project study area intersections and highway segments on Madison Street. Therefore, since the intersections and highway segments included in the study area are exempt from the CMP deficiency plan, a CMP analysis is not required.

Table K - Project Parking Generation

Land Use	Rate	No. of Units	Unit	Parking Required
Retail	1 space/250 sq. feet	41,117	TSF	165
Restaurants	1 space/100 sq. feet	5,943	TSF	60
Health/Fitness Club	1 space/150 sq. feet	37,811	TSF	253
Parking Required				478
15% Reduction Per 19.580.060				(72)
Total Parking Required				406
Parking Provided				432

Notes: TSF=Thousand Square Feet

Source - City of Riverside Municipal Code 19.580.060

APPENDIX A:

SCOPING AGREEMENT



LSA ASSOCIATES, INC.
1500 IOWA AVENUE, SUITE 200
RIVERSIDE, CALIFORNIA 92507

951.781.9810 TEL
951.781.4277 FAX

OTHER OFFICES:
IRVINE
PT. RICHMOND
SAN LUIS OBISPO
PALM SPRINGS

BERKELEY
ROCKLIN
CARLSBAD
FRESNO

March 29, 2016

Mr. Nathan Mustafa, P.E.
Traffic Engineer, City of Riverside
3900 Main Street
Riverside, California 92522

Subject: Scoping Agreement Letter for Madison Plaza Traffic Impact Analysis (LSA Project # PRP1501)

Dear Nathan:

LSA Associates will be preparing a traffic impact analysis (TIA) for the proposed Madison Plaza project to be located on the northwest corner of the intersection of Madison Street and State Route (SR)-91 Westbound Ramps in the City of Riverside (City). Attached Figure 1 illustrates the regional and project location. Figure 2 illustrates the conceptual site plan for the proposed project. Based on the conceptual site plan, the proposed project will consist of one supermarket, two restaurants and one health club and will be approximately 84,871 square feet.

Trip Generation: As shown in Figure 2, the project consists of one supermarket, one health club, and two restaurants, out of which one health club of area 33,810 sq.ft. and Denny's restaurant are now existing. The existing health club is currently not under operation while the existing Denny's restaurant is fully operating. Based on consultation with the City, the project will be eligible for trip credits from both these facilities. Hence, trips from Denny's have not been accounted for, and only trips due to expansion of health club have been accounted for in the project trip generation. Weekday a.m. and p.m. peak hour, and daily trip generation for the project has been developed using rates from the *Institute of Transportation Engineers (ITE) Trip Generation (9th Edition)*. Pass-by trips has been developed using rates from *ITE Trip Generation Handbook, 2nd Edition*. Table A shows the trip generation for the project. As shown in Table A, the project will be generating 193 net trips in the a.m. peak hour, 297 net trips in the p.m. peak hour and 5,113 net trips daily.

Trip Distribution and Study Intersections: Project trip distribution pattern is based on the locations of residential, employment, and commercial centers in relation to the proposed project. Attached Figure 3 illustrates the study area intersections. Figure 4 illustrates the project trip distribution. As shown in Figure 4, approximately 30 percent of project trips will travel northwards along Madison Street, 30 percent of project trips will travel southwards along Madison Street and 20 percent of project trips will travel westwards and eastwards along SR-91 respectively. The two project driveways on Madison Street are proposed to be full access driveways. Figure 5 illustrates the project trip assignment. LSA proposes to develop pass-by distribution and assignment based on existing traffic counts on Madison Street. Pass-by distribution and assignment will be included in the TIA.

The TIA will be prepared based on *City of Riverside Traffic Impact Analysis Guidelines December 2014*. Study intersections were identified based on City's TIA guidelines which require analysis of all intersections of Collector or higher classification streets where the project will contribute 50 or more

3/29/2016 (R:\PRP1501_Madison Plaza\Technical Studies\Traffic\Scoping\Scoping Letter.docx)

peak hour trips, not exceeding a 5-mile radius from the project site. Thus, LSA proposes to include the following 10 intersections for analysis in the TIA:

1. Madison Street/Magnolia Avenue
2. Madison Street/Elementary School Outlet
3. Madison Street/Orchard Street
4. Madison Street/Project Driveway 1
5. Madison Street/Project Driveway 2
6. Madison Street/Gas Station Access
7. Madison Street/SR-91 Westbound Ramps
8. Madison Street/SR-91 Eastbound Ramps
9. Madison Street/Indiana Avenue
10. Madison Street/Evans Street

Analysis Scenarios: Based on the City's TIA guidelines, the TIA will examine the following six analysis scenarios:

- Existing conditions;
- Existing Plus Project conditions;
- Project Completion Conditions;
- Project Completion Plus Project Conditions;
- Cumulative Conditions; and
- Cumulative Conditions Plus Project Conditions.

Volume Development: Traffic volumes for existing conditions will be developed by collecting existing traffic counts at study intersection. Traffic generated by the proposed project will then be added to existing traffic volumes to develop existing plus project traffic volumes.

Traffic volumes for project completion conditions will be developed by applying a growth rate to existing traffic volumes. The growth rate will be determined based on consultation with City staff. Traffic generated by the proposed project will then be added to project completion conditions traffic volumes to develop project completion plus project traffic volumes.

Traffic volumes for cumulative without project conditions will be developed by adding traffic volumes from approved and pending projects to traffic volumes under project completion conditions. Traffic generated by the proposed project will be added to cumulative without project traffic volumes to develop cumulative with project traffic volumes.

All study intersections will be analyzed during the a.m. and p.m. peak hours. The a.m. peak hour is defined as the one hour of highest traffic volumes occurring between 7:00 and 9:00 a.m., while the p.m. peak hour is defined as the one hour of highest traffic volume occurring between 4:00 and 6:00

p.m. Intersection levels of service (LOS) will be calculated using the appropriate *Highway Capacity Manual 2010* (HCM) analysis methodologies using *Synchro 9.0* software.

Traffic Signal Warrant: A traffic signal warrant analysis will be performed for all unsignalized study intersections for all of the analysis scenarios. The analysis will be performed using the latest edition of the CA-MUTCD and the analysis results will be included in the appendices.

On-Site Circulation Analysis: For purposes of this project, the study will include a brief discussion on internal circulation and proposed on-site parking. It will illustrate and discuss how vehicles would enter and exit via the project access driveways and identify any potential on-site or off-site circulation issue. This will include truck turning paths for any proposed truck movement.

Project Impact Assessment and Mitigation Measures: Intersection LOS without the project will be compared to the intersection LOS with the project for each of the analysis scenarios to determine potential project impacts. Determination of the significance of project impacts will be made based on City's LOS and threshold of significance criteria. At significantly impacted intersections, as determined based on LOS analysis, mitigation measures will be recommended and the LOS recalculated to verify that the required LOS has been achieved. Mitigation measures may include intersection turn lanes, signalization, and segment lane additions. The LOS with mitigation will be calculated and summarized, along with a comparison of the LOS without mitigation.

Information Request: LSA will request the City to provide a list of approved and pending projects and roadway improvements in the vicinity of the proposed project.

Please review the scope of the analysis outlined in this letter and the accompanying figures and tables. Should the City have any comments or require additional information, please do not hesitate to contact me at (951) 781-9310 or via e-mail Ambarish.Mukherjee@lsa-assoc.com.

Sincerely,

LSA ASSOCIATES, INC.



Ambarish Mukherjee, AICP
Associate

Attachments:

Table A – Project Trip Generation
Figure 1 – Regional and Project Location
Figure 2 – Conceptual Site Plan
Figure 3 – Study Area Intersections
Figure 4 – Project Trip Distribution
Figure 5 – Project Trip Assignment
Exhibit B – Scoping Agreement for Traffic Impact Study
Table B – Cumulative Projects

Table A - Project Trip Generation

Land Uses	Units	A.M. Peak Hour			P.M. Peak Hour			Daily
		In	Out	Total	In	Out	Total	
Major B Market¹								
Trips/Unit		2.11	1.29	3.40	4.83	4.65	9.48	102.24
Trip Generation	41.1 TSF	87	53	140	199	191	390	4,204
Pass By Trips ²					(70)	(70)	(140)	(140)
Net New Trips		87	53	140	129	121	250	4,064
Major A Health Club³								
Trips/Unit		0.71	0.71	1.41	2.01	1.52	3.53	32.93
Proposed Trip Generation	37.8 TSF	27	27	54	76	57	133	1,246
Existing Trip Generation	33.8 TSF	24	24	48	68	51	119	1114
Net New Trips		3	3	6	8	6	14	132
PAD 1 Drive-Thru Restaurant⁴								
Trips/Unit		23.16	22.26	45.42	16.98	15.67	32.65	496.12
Trip Generation	2.0 TSF	46	45	91	34	31	65	993
Pass By Trips ⁵		(22)	(22)	(44)	(16)	(16)	(32)	(76)
Net New Trips		24	23	47	18	15	33	917
PAD 2 Retail/Restaurants		Existing Denny's Restaurant trips already exist and have not been accounted for in the project trip generation.						
Trip Generation	3.9 TSF							
Total Gross New Trips		136	101	237	241	228	469	5,329
Total Pass-By Trips		(22)	(22)	(44)	(86)	(86)	(172)	(216)
Total Net New Trips		114	79	193	155	142	297	5,113

TSF = thousand square feet

¹ Rates are based on Land Use 850 - "Supermarket" from *Institute of Transportation Engineers (ITE) Trip Generation (9th Edition)*.² Pass-by rates are based on Land Use 850 - "Supermarket" from *ITE Trip Generation Handbook, 2nd Edition*. During the a.m. peak hour pass-by trips are nominal for supermarket uses and therefore no pass-by credit was taken during the a.m. peak hour. Since no daily pass-by rates are provided in the *ITE Trip Generation manual*, therefore, p.m. pass-by trips were used for daily pass-by trips as a conservative approach.³ Rates are based on Land Use 492 - "Health/Fitness Club" from *ITE Trip Generation (9th Edition)*.⁴ Rates are based on Land Use 934 - "Fast-Food Restaurant with Drive-Through Window" from *ITE Trip Generation (9th Edition)*.⁵ Pass-by rates are based on Land Use 934 - "Fast-Food Restaurant with Drive-Through Window" from *ITE Trip Generation Handbook, 2nd Edition*.

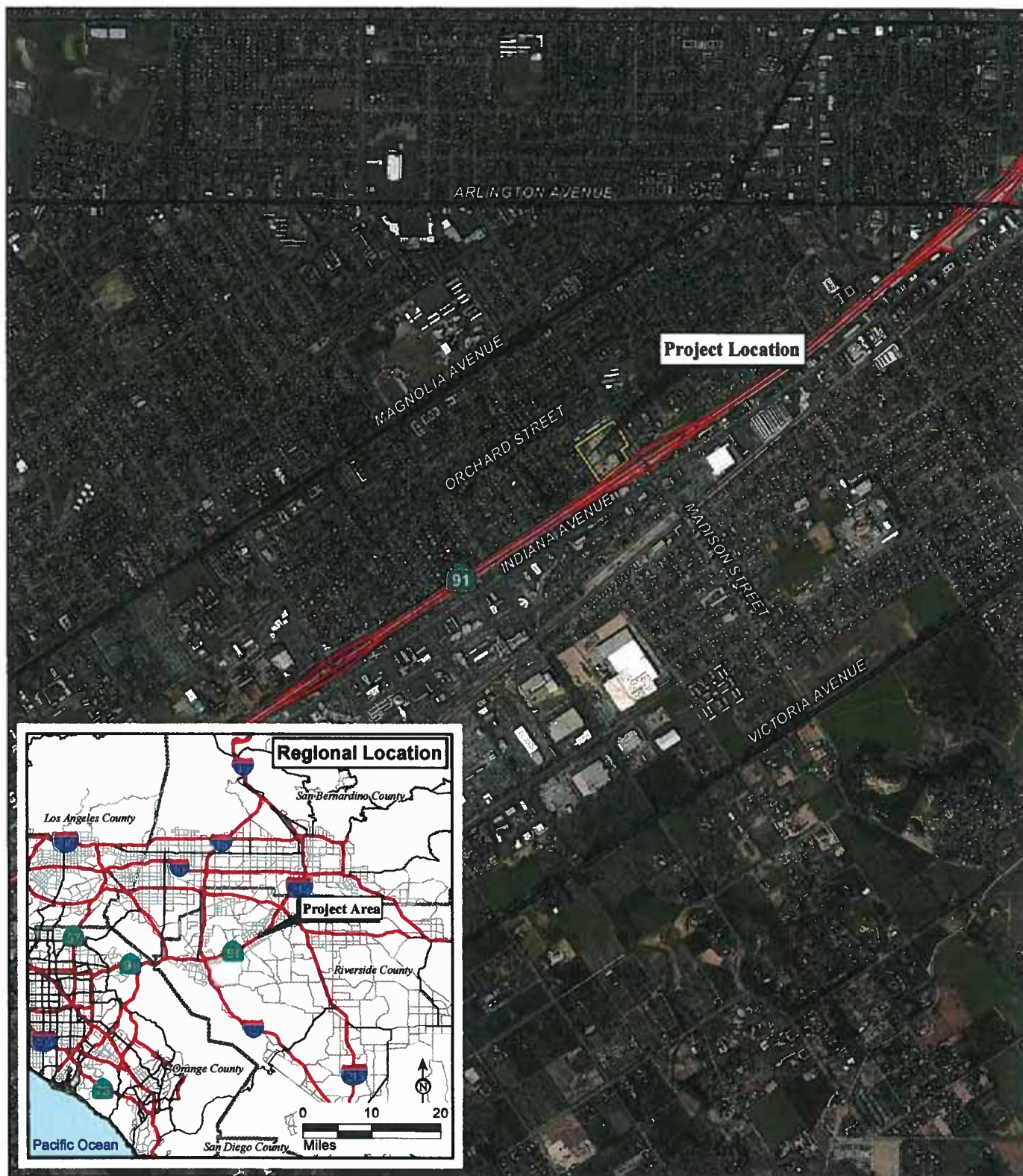
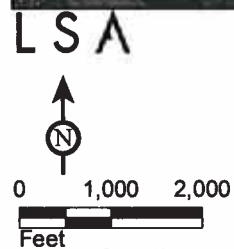
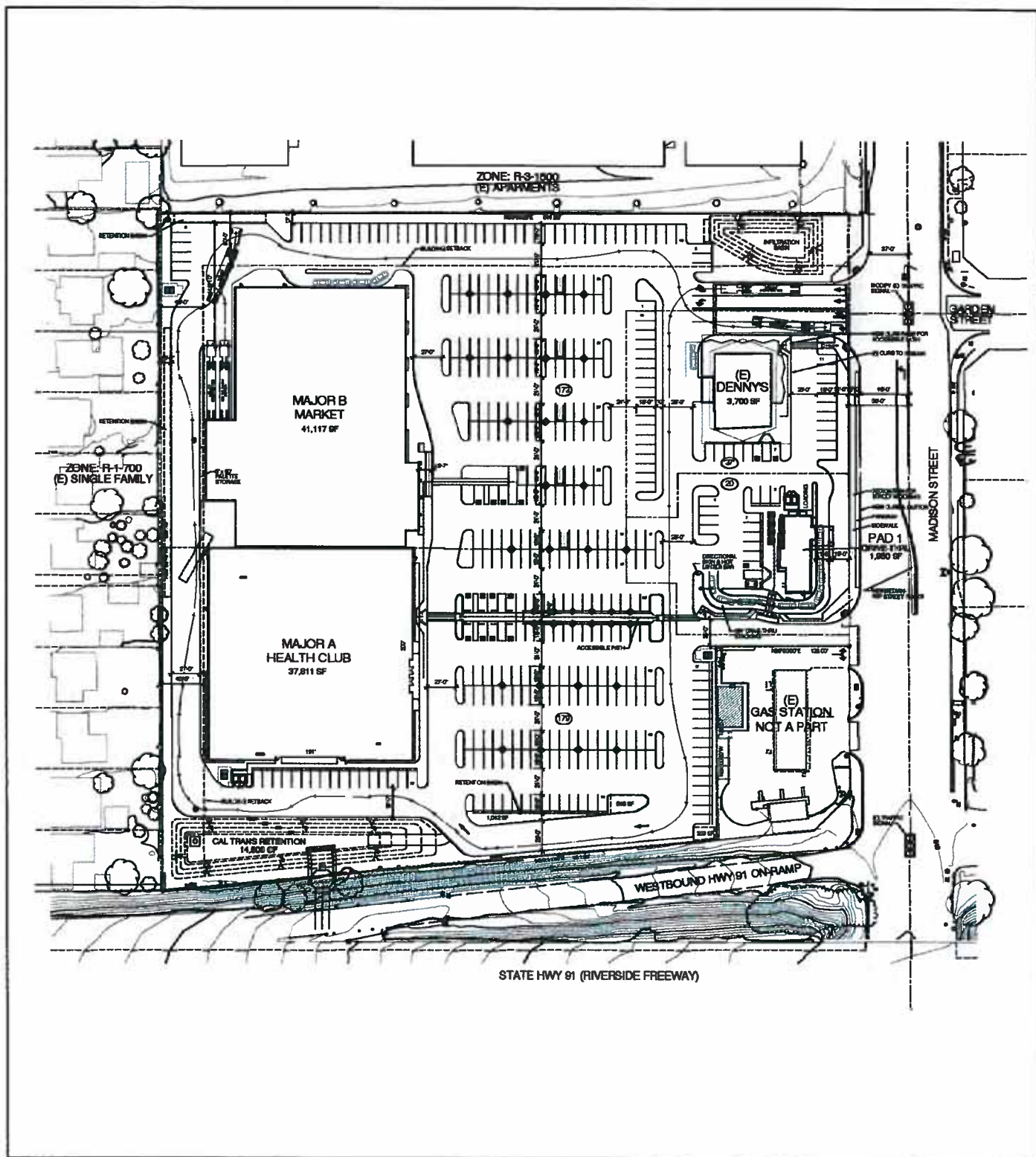


FIGURE 1



SOURCE: Bing Aerial, 2010; County of Riverside, 2015.
I:\PRP1501\Reports\Traffic\fig1_RegLoc.mxd (12/1/2015)

Madison Plaza
Traffic Impact Analysis
Regional and Project Location



LSA

FIGURE 2

*Madison Plaza
Traffic Impact Analysis
Conceptual Site Plan*

SOURCE: GK Pierce Architects, 2015

I:\PRP1501\Reports\Traffic\fig2_SitePlan.cdr (12/11/2015)

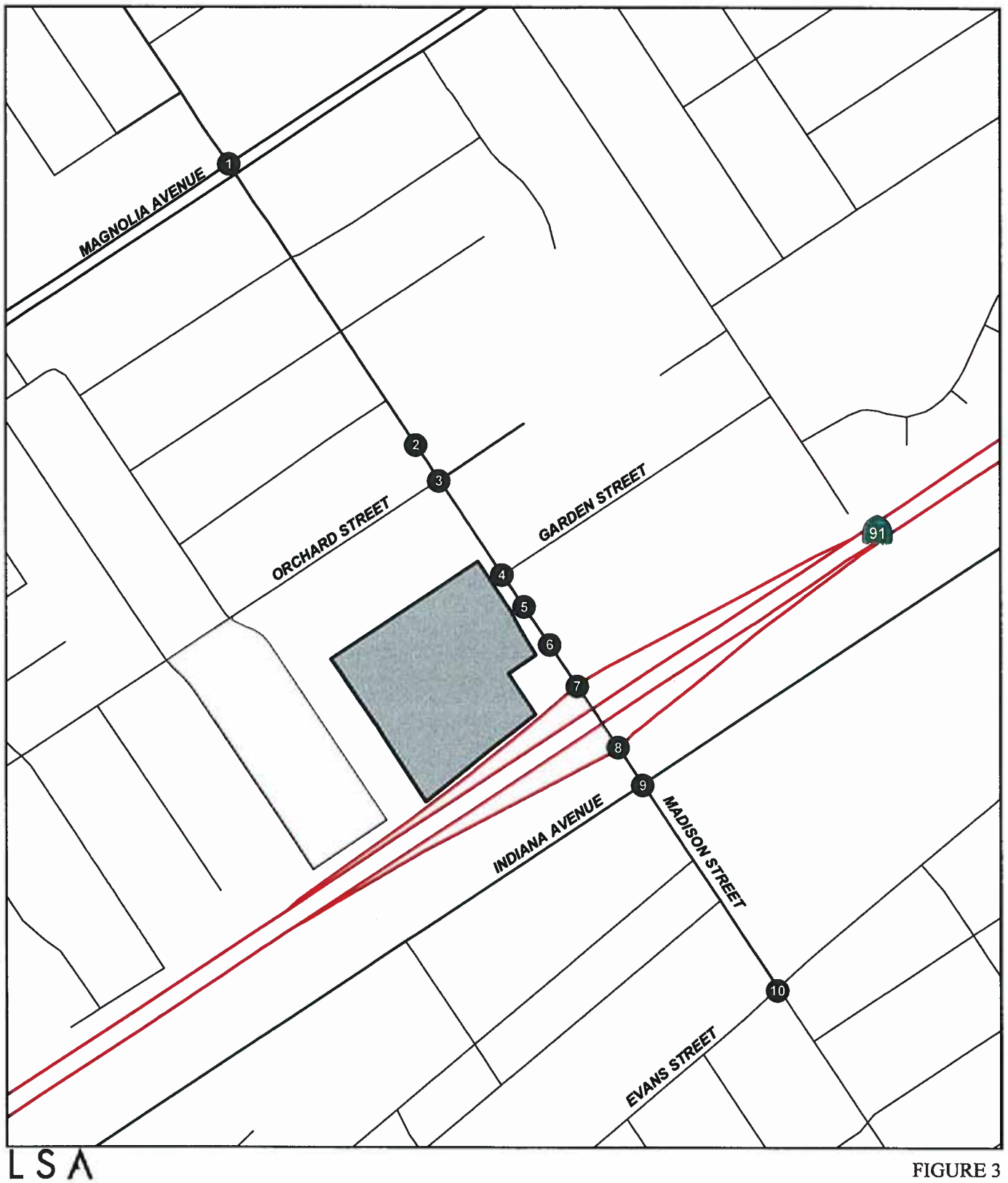
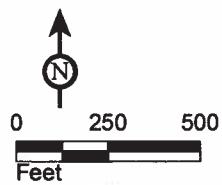


FIGURE 3



- Project Location
- Study Area Intersections

SOURCE: Bing Aerial, 2010; County of Riverside, 2015

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Madison Plaza
Traffic Impact Analysis
Study Area Intersections

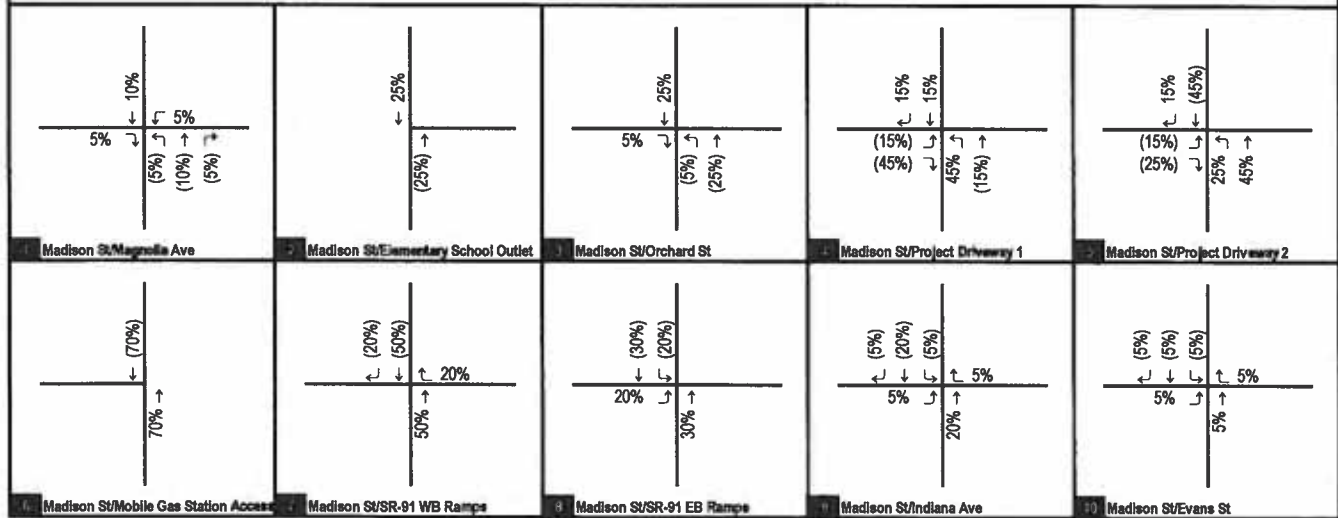
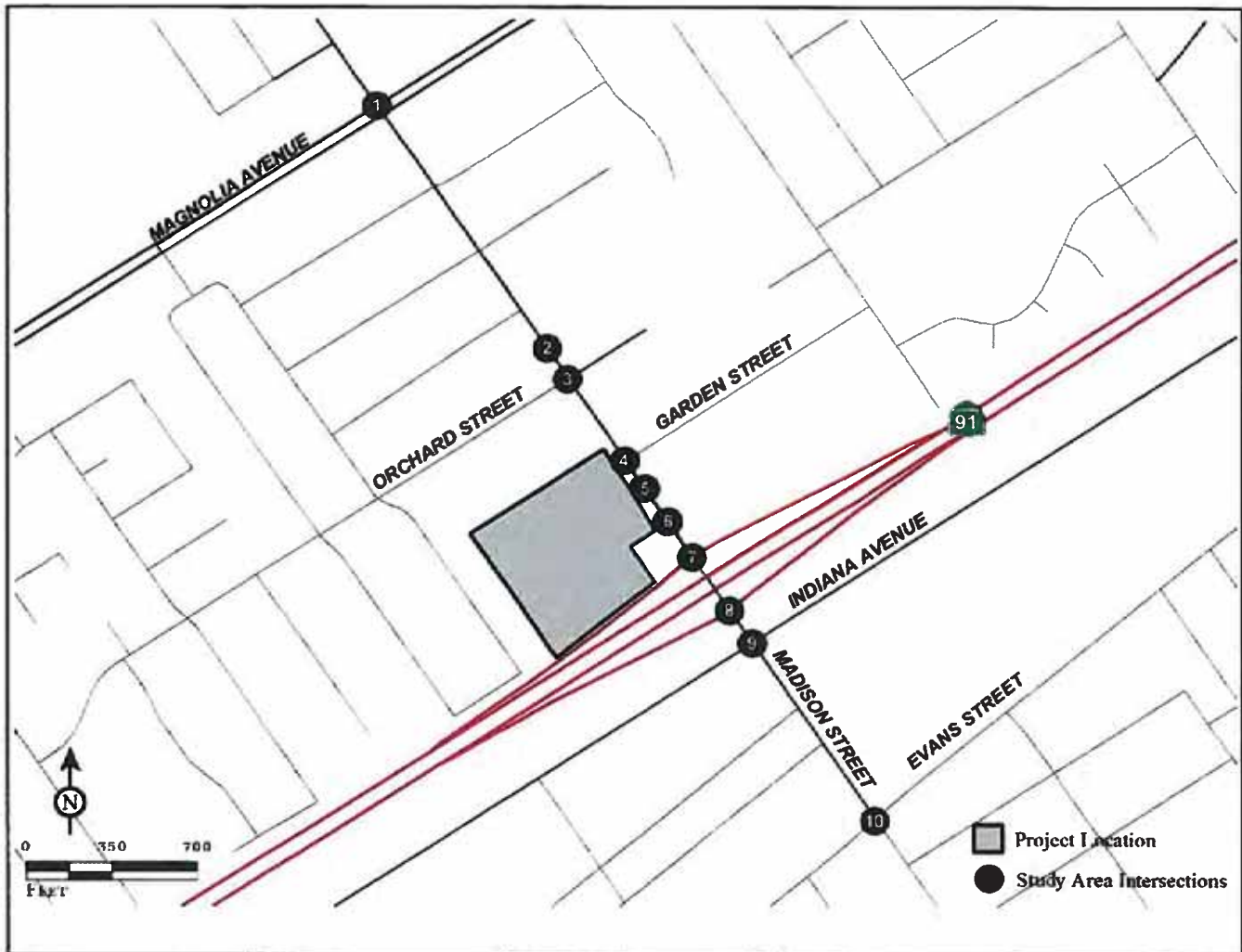


FIGURE 4

LSA

xx%(yy%) Inbound%(Outbound%) Trip Distribution

*Madison Plaza
Traffic Impact Analysis
Project Trip Distribution*

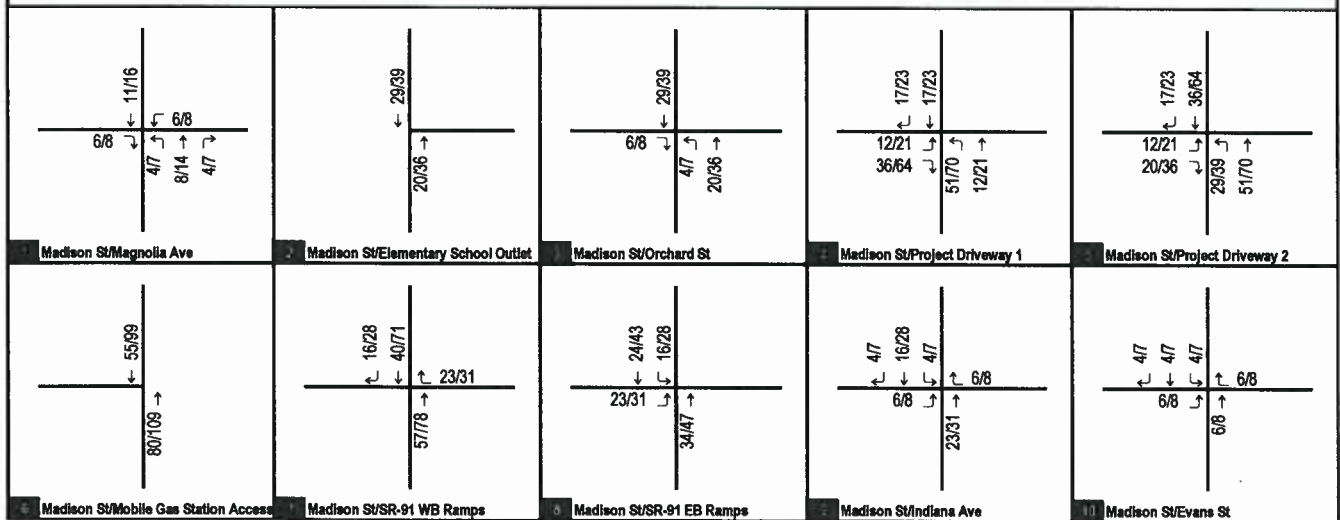
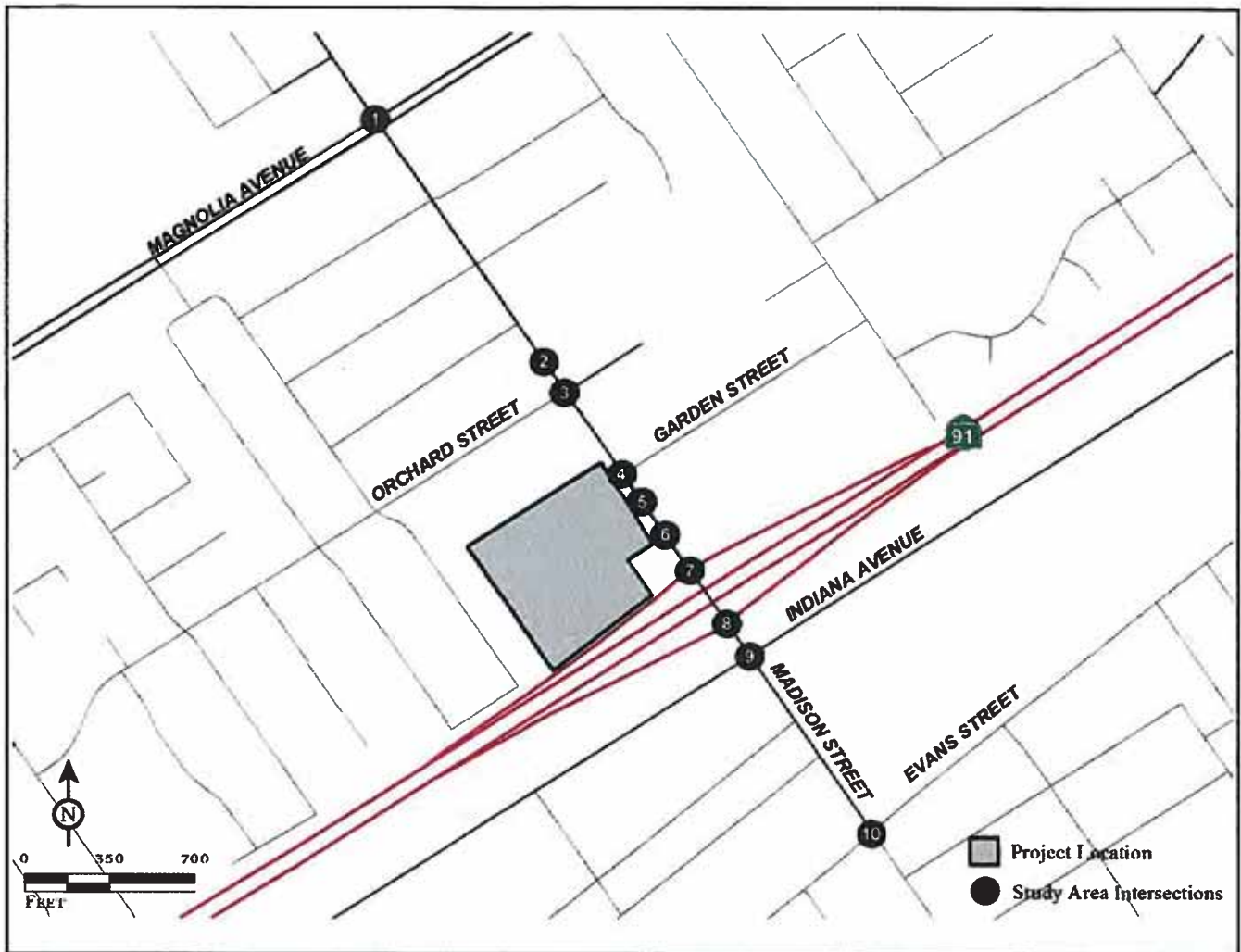


FIGURE 5

LSA

xxx/yyy AM/PM Peak Hour Trips

Madison Plaza
Traffic Impact Analysis
Project Trip Assignment

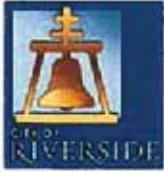


Exhibit B

SCOPING AGREEMENT FOR TRAFFIC IMPACT STUDY

This letter acknowledges the City of Riverside Public Works Traffic Engineering Division requirements for traffic impact analysis of the following project. The analysis must follow the City Traffic Impact Analysis Preparation Guide dated December 2014.

Case No. _____
Related Cases - _____
SP No. _____
EIR No. _____
GPA No. _____
CZ No. _____
Project Name: Madison Plaza
Project Location: Northwest corner of Madison Street and State Route 91 Westbound Ramps
Project Description: One supermarket, two restaurants and one health club and will be approximately 84,871 square feet

	<u>Consultant</u>	<u>Developer</u>
Name:	<u>LSA Associates</u>	<u>PRP MADISON INVERSTORS, LLC</u>
Address:	<u>1500 Iowa Avenue</u> <u>Riverside, CA 92507</u>	<u>417 29TH STREET</u> <u>Newport Beach, CA 92863</u>
Telephone:	<u>951-781-9310</u>	<u>949.723.9500</u>

A. Trip Generation Source: ITE Trip Generation Manual, most recent edition

Existing Land Use	<u>Mixed Use-Urban</u>	Proposed Land Use	<u>Mixed Use-Urban</u>
Existing Zoning	<u>MU-U</u>	Proposed Zoning	<u>MU-U</u>
Total Daily Trips	<u>5,113 (Please see attached Trip Generation)</u>		

	In	Out	Total
AM Trips	<u>114</u>	<u>79</u>	<u>193</u>
PM Trips	<u>155</u>	<u>142</u>	<u>297</u>

Internal Trip ☐ Yes ☒ No (_____ % Trip Discount)
Allowance
Pass-By Trip Allowance ☒ Yes ☐ No (4.05 % Trip Discount)
(Attach additional sheet if this is a multi-use site with a breakdown of trips generated)

B. Trip Geographic Distribution: N 30 % S 30 % E 20 % W 20 %
(See attached exhibit for detailed assignment)

C. Background Traffic

Project Completion Year: 2016 Annual Ambient Growth Rate: 2 %
Other area projects to be included: A list of cumulative projects in the area is requested - SEE TABLE B

Please contact Planning Division or use the most recently provided data

Model/Forecast methodology if required Not applicable

D. Build-out Studies: Does this project require a Build-out Study per TIA Guidelines Section 7.2?

☐ Yes ☒ No

E. Study intersections: (NOTE: Subject to revision after other projects, trip generation and distribution are determined, or comments from other agencies.)

- | | |
|---|---|
| 1. <u>Madison St/Magnolia Ave</u> | 5. <u>Madison St/Project Driveway 2</u> |
| 2. <u>Madison St/Madison Elementary School Outlet</u> | 6. <u>Madison St/Gas Station Access</u> |
| 3. <u>Madison St/Orchard St</u> | 7. <u>Madison St/SR-91 WB Ramps; 8. Madison St/SR-91 EB Ramps</u> |
| 4. <u>Madison St/Project Driveway 1</u> | 8. <u>9. Madison St/Indiana Ave; 10. Madison St/Evans St</u> |

F. Study Roadway Segments (For Build-out Studies):

- | | |
|----------|----------|
| 1. _____ | 5. _____ |
| 2. _____ | 6. _____ |
| 3. _____ | 7. _____ |
| 4. _____ | 8. _____ |

G. Other Jurisdictional Impacts

Is this project within any other Agency's Sphere of Influence or one-mile radius of boundaries? ☒ Yes ☒ No

If so, name of Jurisdiction: CALTRANS

H. Site Plan (please attach a legible 11'X17' copy)

I. Specific issues to be addressed in the Study (in addition to the standard analysis described in the Guideline) (To be filled out by Public Works Traffic Department)

NBLT CAPACITY / ALIGNMENT AT I/S 4 (MADISON
& GARDEN)

Recommended by:

Ambarish Mukherjee

Consultant's Representative

3/29/2016

Date

Scoping Agreement Submitted on

Date

Scoping Agreement Resubmitted on

Date

Approved Scoping Agreement:

[Signature]
City of Riverside
Traffic Engineering Division

4/8/16
Date

cc: Planning Division

Table B - Cumulative Projects Trip Generation

Project No.	Location	Land Use	Units	Rate	A.M. Peak Hour			P.M. Peak Hour			Daily
					In	Out	Total	In	Out	Total	
1	8069 Indiana Avenue	Automobile Sales Expansion	7.373 TSF	Trips/Unit ¹ Trip Generation	1.44 11	0.48 4	1.92 15	1.05 8	1.57 12	2.62 20	32.30 238
2	North West Corner of Dominion Avenue and Division Street	Fast-Food With Drive Through	3.795 TSF	Trips/Unit ² Trip Generation Pass By Trips ³ Net Trip Generation	23.16 88 (42) 46	22.26 84 (42) 42	45.42 172 (84) 88	16.98 64 (31) 33	15.67 59 (31) 28	32.65 123 (62) 61	496.12 1,883 (146) 1,736
3	North West Corner of Dominion Avenue and Division Street	Condominium	36 D.U.	Trips/Unit ⁴ Trip Generation	0.07 3	0.37 13	0.44 16	0.35 13	0.17 6	0.52 19	5.81 209
4	South of Arlington; between Royale Pl and Sunset Ranch Dr	Single-Family Residential	10 D.U.	Trips/Unit ⁵ Trip Generation	0.19 2	0.56 6	0.75 8	0.63 6	0.37 4	1.00 10	9.52 95
5	3439 Arlington Ave	Shopping Center	15.186 TSF	Trips/Unit ⁶ Trip Generation Pass By Trips ⁷ Net Trip Generation	0.60 9 9	0.36 6 6	0.96 15 15	1.78 27 17	1.93 29 19	3.71 56 37	42.70 648 (19) 629
Total Net Trip Generation					71	71	142	77	69	147	2,908

Notes: TSF = Thousand Square Feet, DU=Dwelling Units

¹Rates based on Land Use 841 "Automobile Sales" from ITE *Trip Generation*, 9th Edition.²Rates based on Land Use 934 - "Fast-Food With Drive Through" from ITE *Trip Generation*, 9th Edition.³Pass-by rates based on rates for Land Use 934 - "Fast Food Restaurant with Drive-Through Window" from ITE *Trip Generation Handbook* 2nd Edition.

Since there is no data available for daily pass-by trips, the sum of a.m. and p.m. pass-by trips have been applied to the daily trip generation.

⁴Rates based on Land Use 230 - "Condominium" from ITE *Trip Generation* 9th Edition.⁵Rates based on Land Use 210 "Single-Family Detached Housing" from ITE *Trip Generation* 9th Edition.⁶Rates based on Land Use 820 - "Shopping Center" from ITE *Trip Generation* 9th Edition.⁷Pass-by rates based on rates for Land Use 820 - "Shopping Center" from ITE *Trip Generation Handbook* 2nd Edition. Because there are no data available on a.m. and daily pass-by trips, no reductions have been taken for the a.m. trips, and only the p.m. peak hour pass-by trips have been subtracted from the daily trip generation.

APPENDIX B:

TRAFFIC COUNT SHEETS

ITM Peak Hour Summary

Prepared by:



National Data & Surveying Services

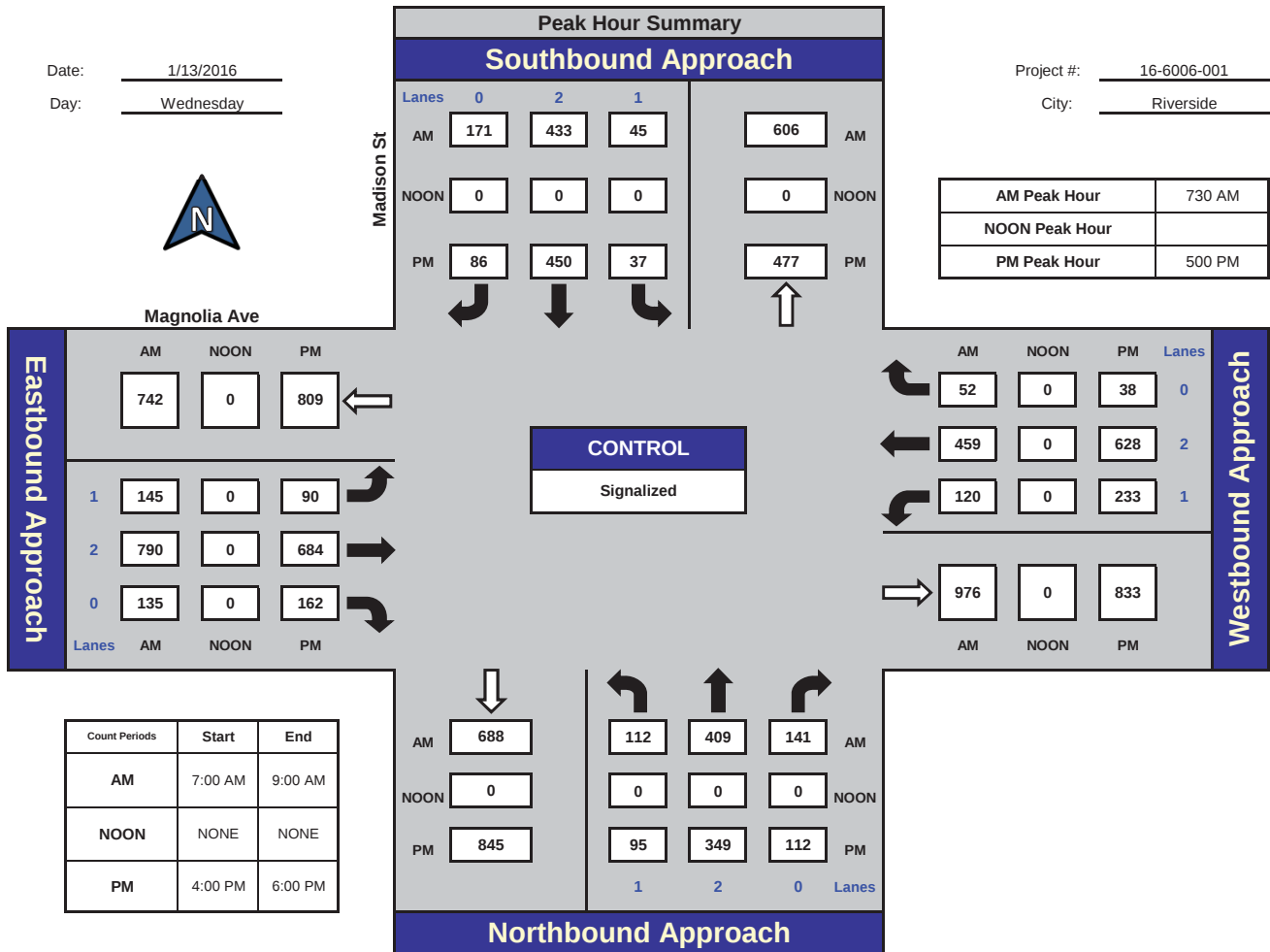
Madison St and Magnolia Ave , Riverside

Date: 1/13/2016

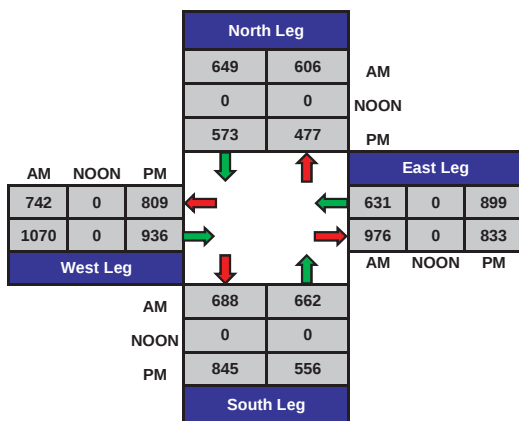
Day: Wednesday

Project #: 16-6006-001

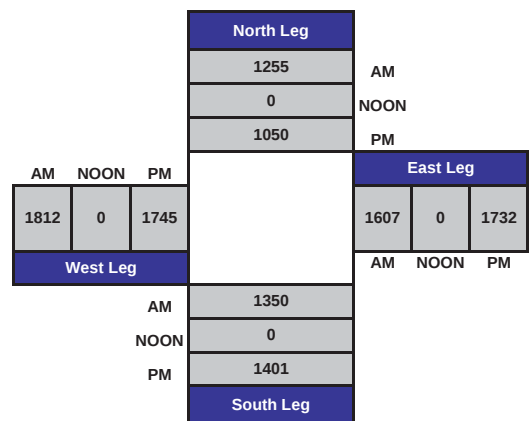
City: Riverside



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:



National Data & Surveying Services

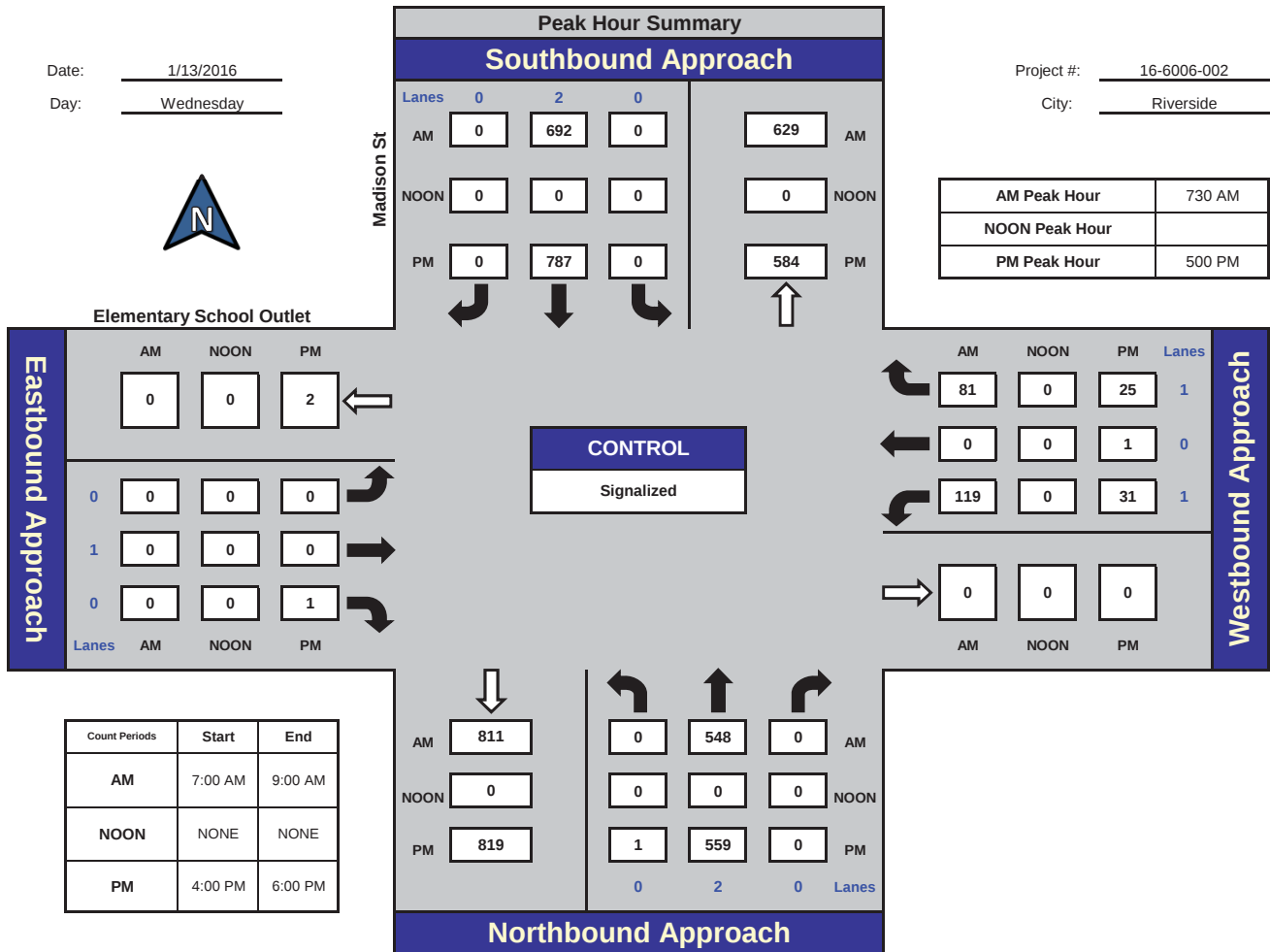
Madison St and Elementary School Outlet , Riverside

Date: 1/13/2016

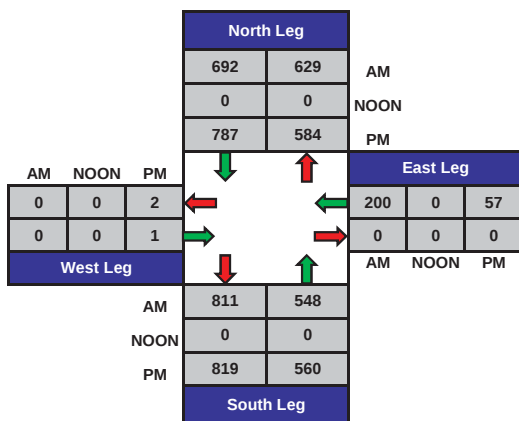
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Project #: 16-6006-002

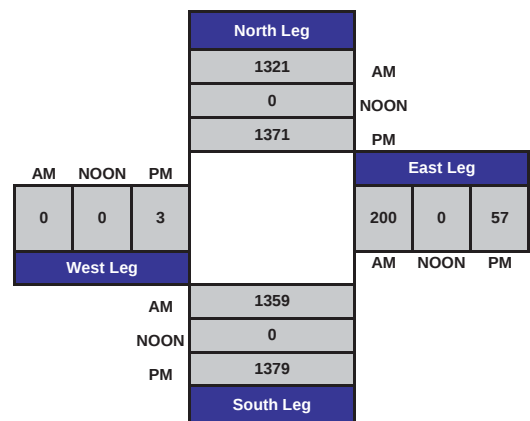
City: Riverside



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:



National Data & Surveying Services

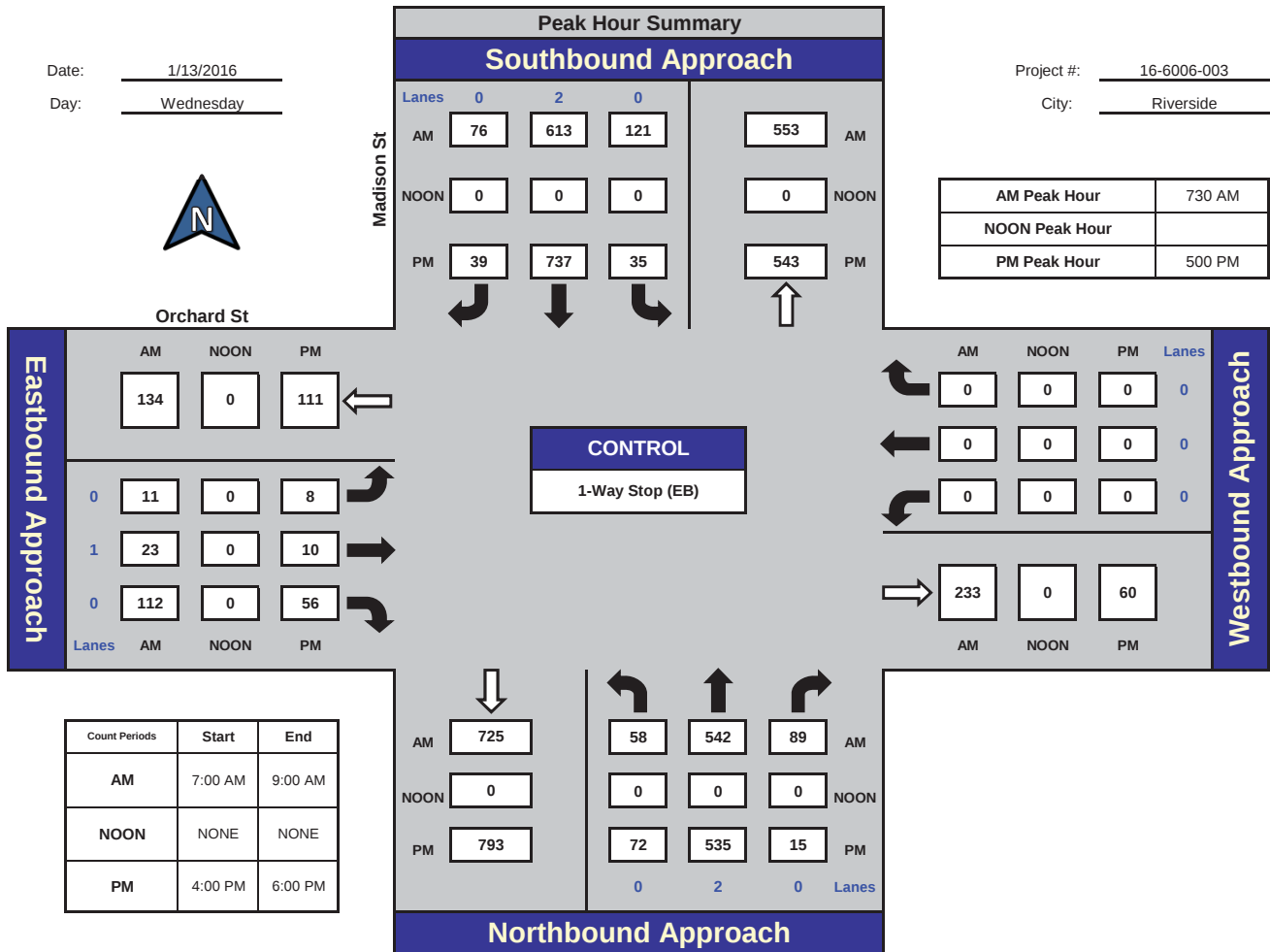
Madison St and Orchard St, Riverside

Date: 1/13/2016

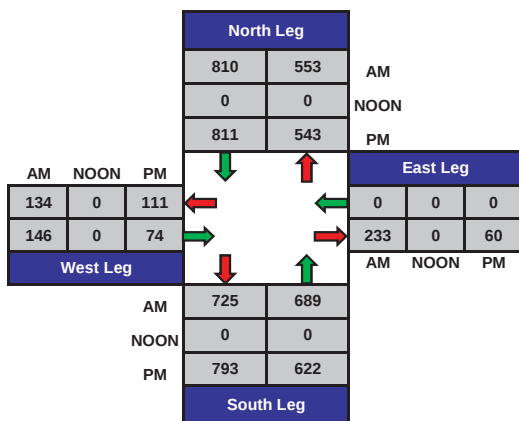
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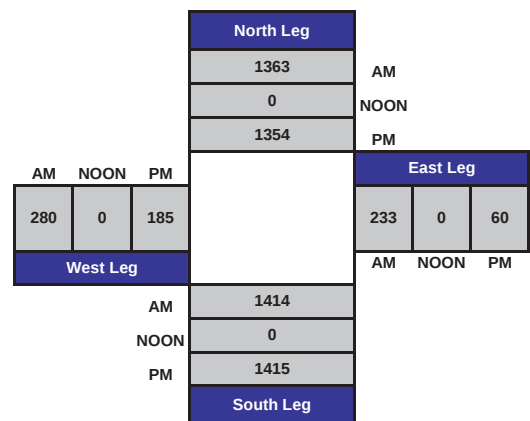
City: Riverside



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

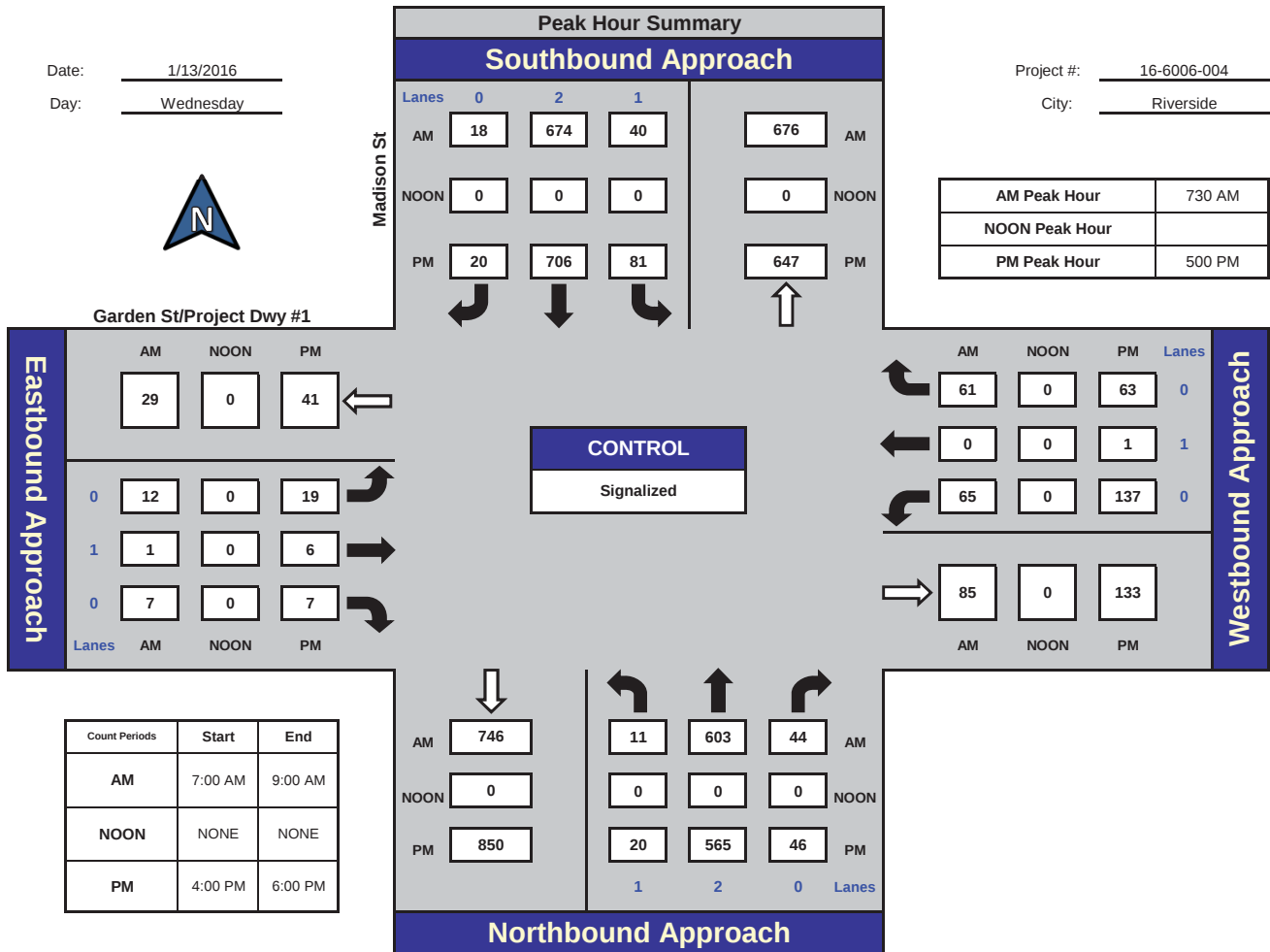


National Data & Surveying Services

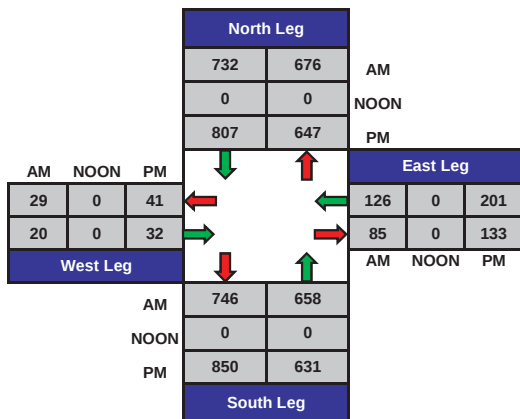
Madison St and Garden St/Project Dwy #1, Riverside

Date: 1/13/2016
Day: Wednesday

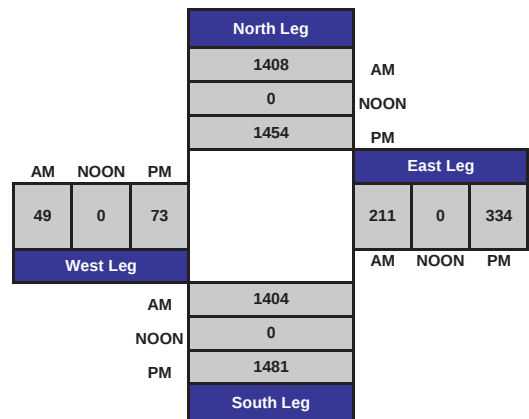
Project #: 16-6006-004
City: Riverside



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:



National Data & Surveying Services

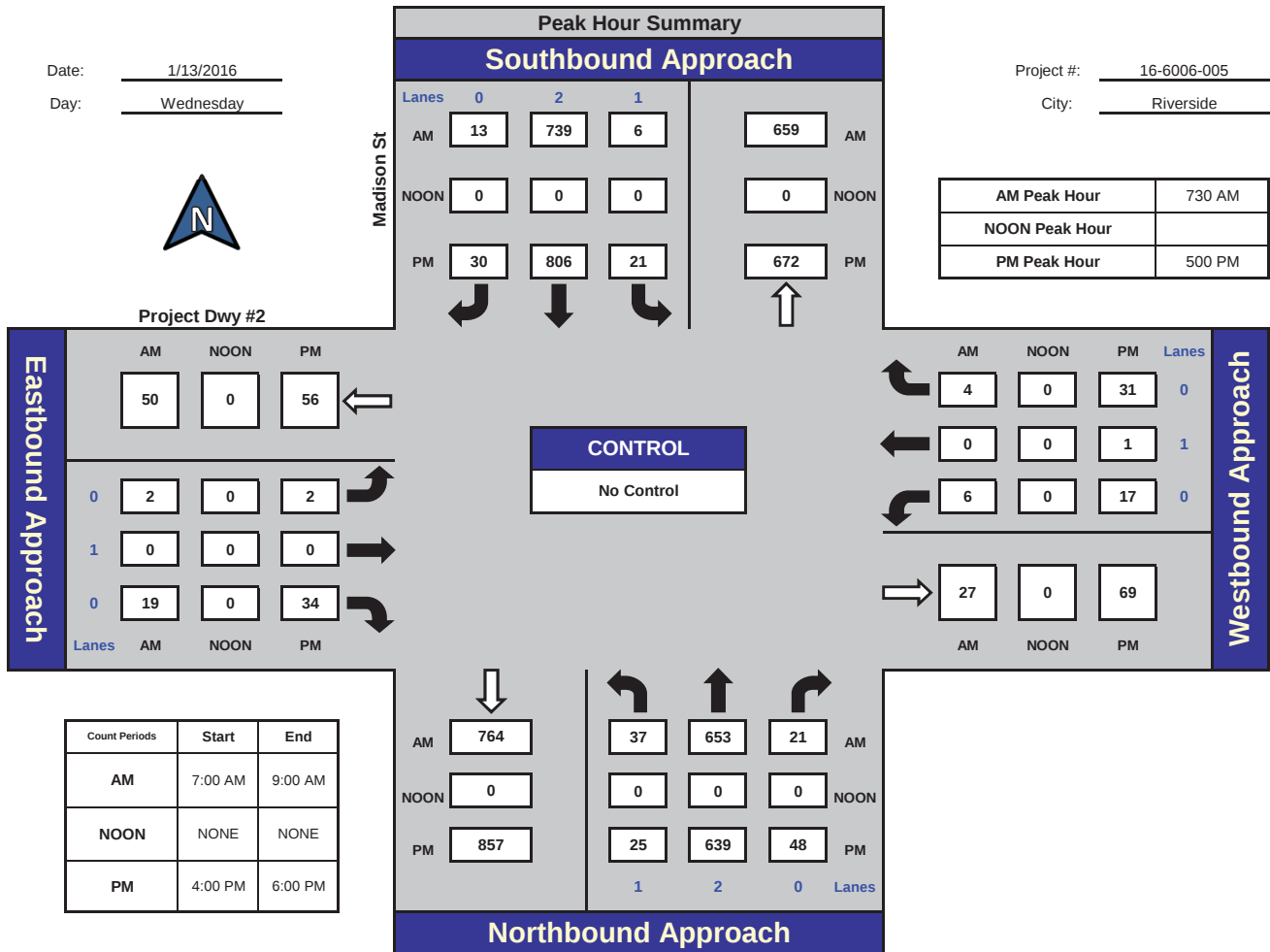
Madison St and Project Dwy #2, Riverside

Date: 1/13/2016

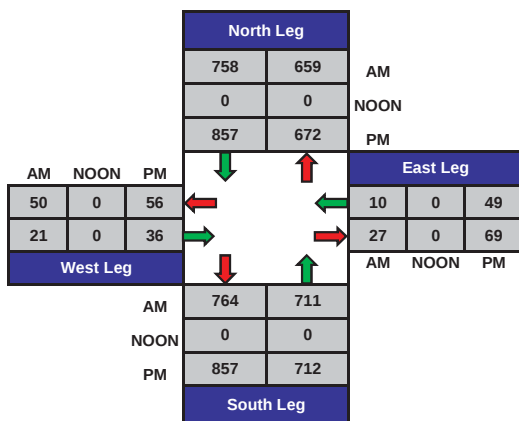
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Project #: 16-6006-005

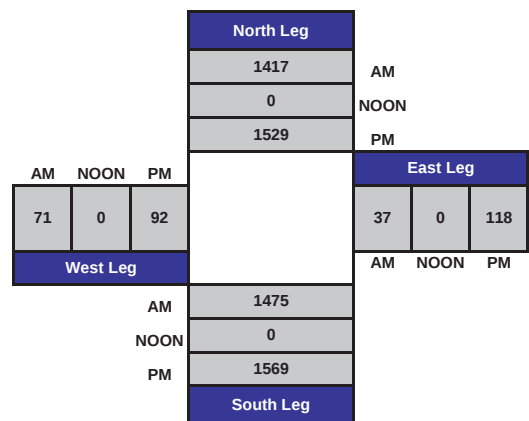
City: Riverside



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:



National Data & Surveying Services

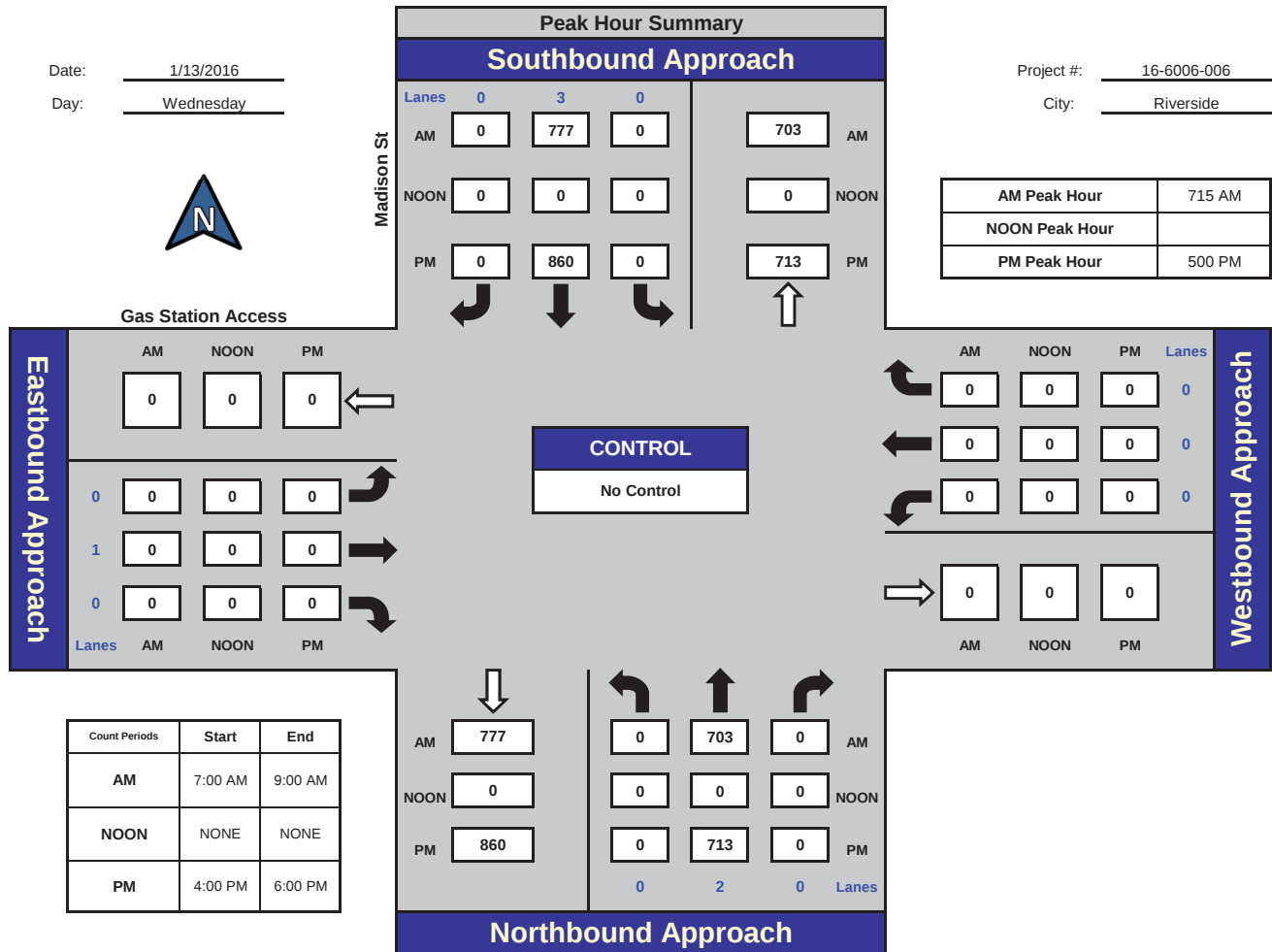
Madison St and Gas Station Access , Riverside

Date: 1/13/2016

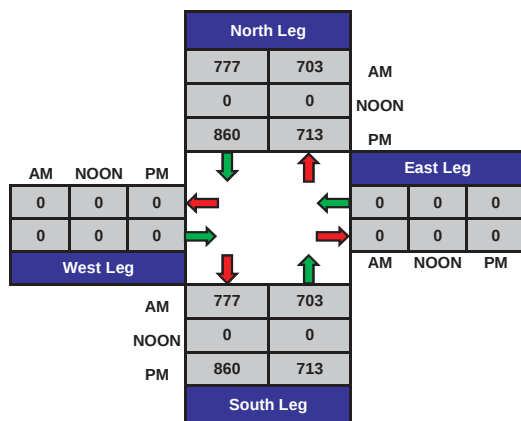
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Project #: 16-6006-006

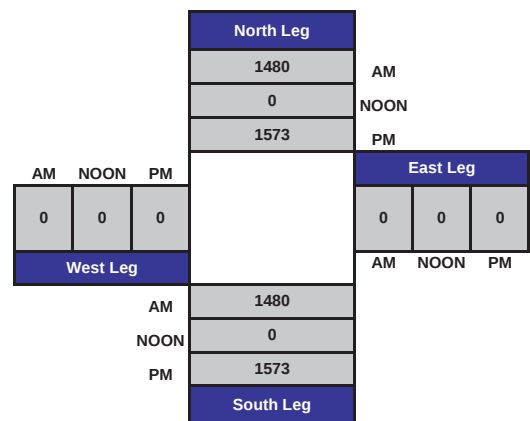
City: Riverside



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:



National Data & Surveying Services

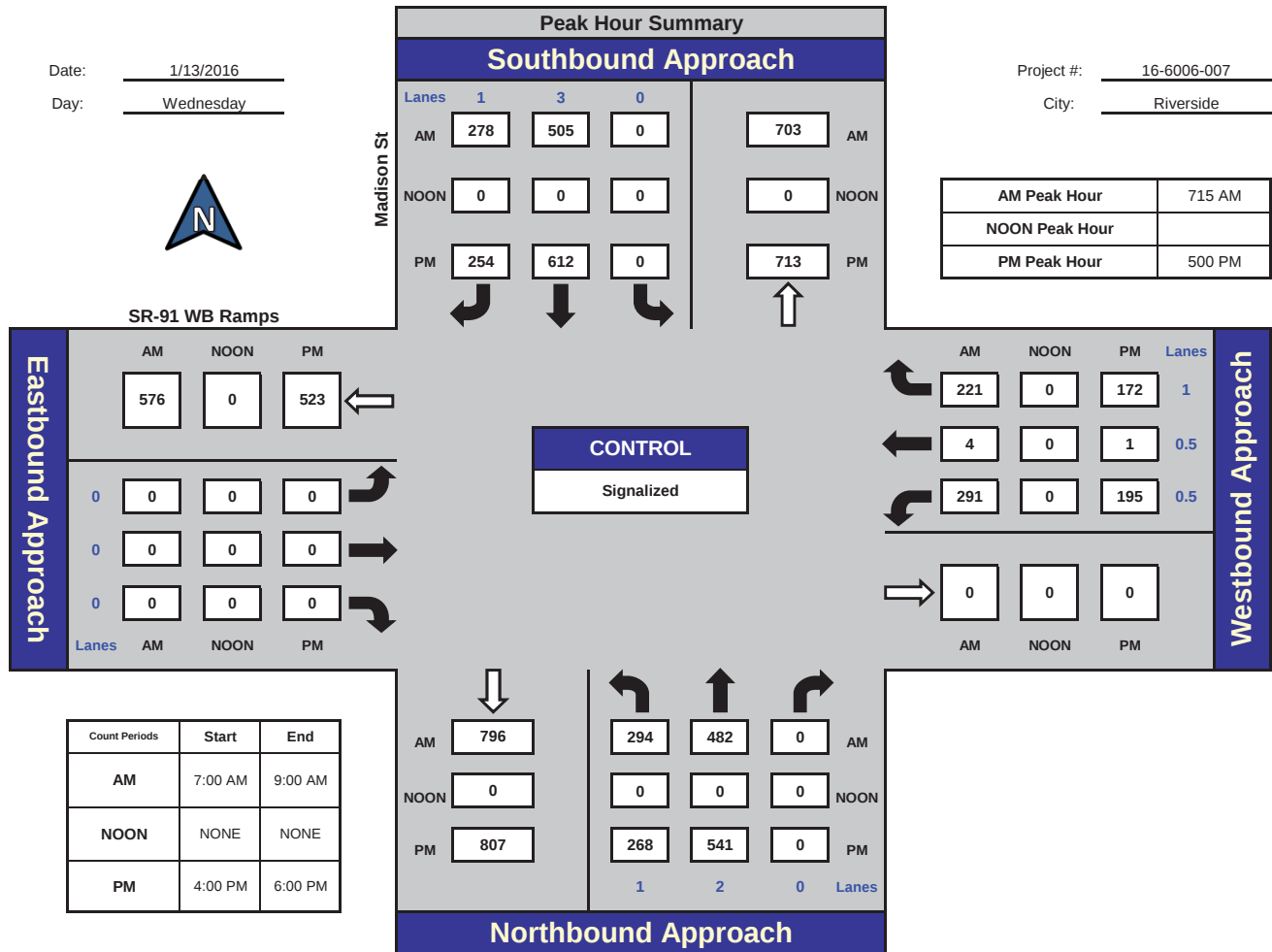
Madison St and SR-91 WB Ramps , Riverside

Date: 1/13/2016

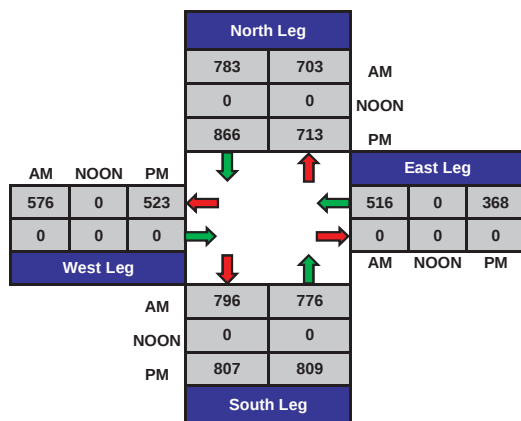
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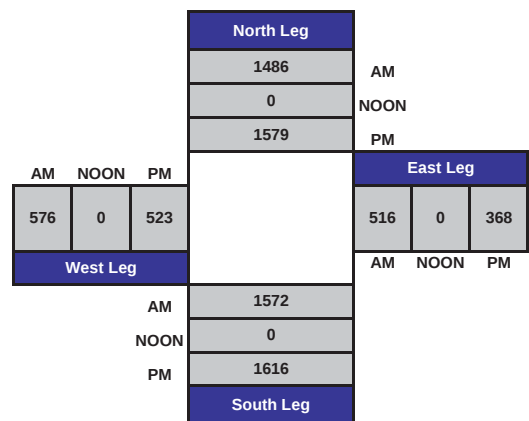
City: Riverside



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:



National Data & Surveying Services

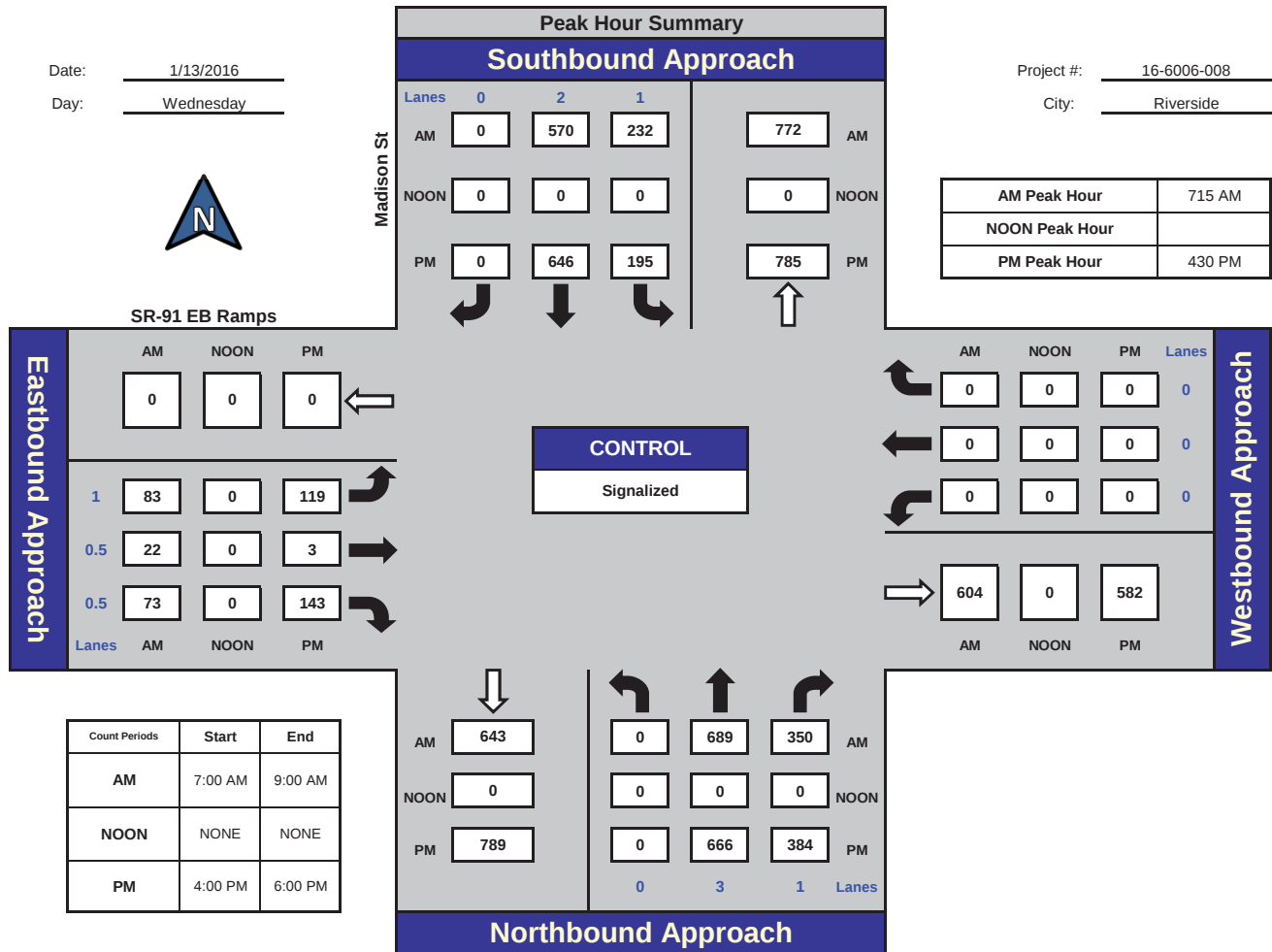
Madison St and SR-91 EB Ramps , Riverside

Date: 1/13/2016

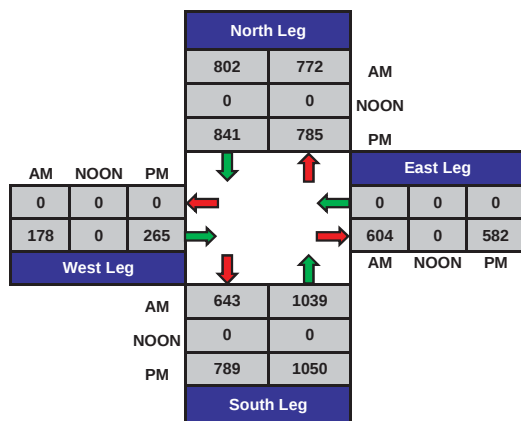
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Project #: 16-6006-008

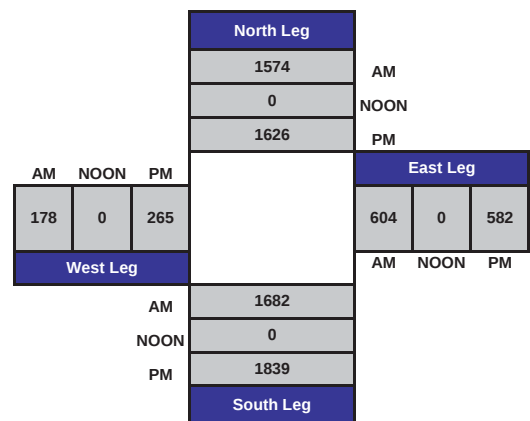
City: Riverside



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:



National Data & Surveying Services

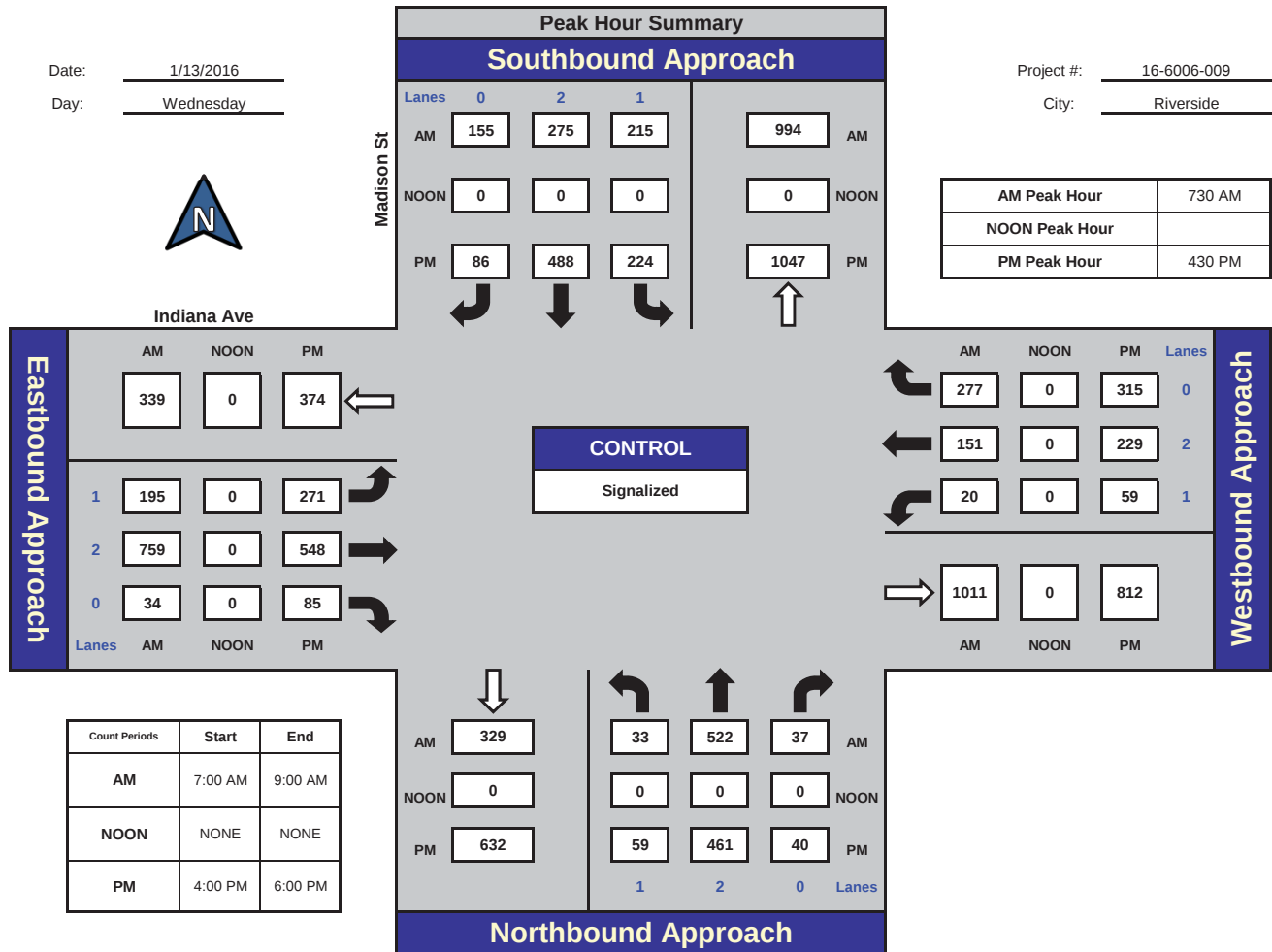
Madison St and Indiana Ave , Riverside

Date: 1/13/2016

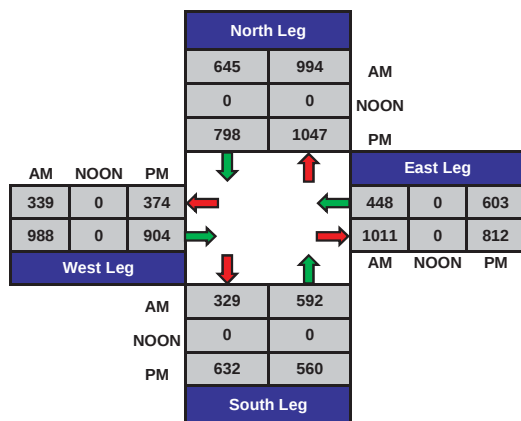
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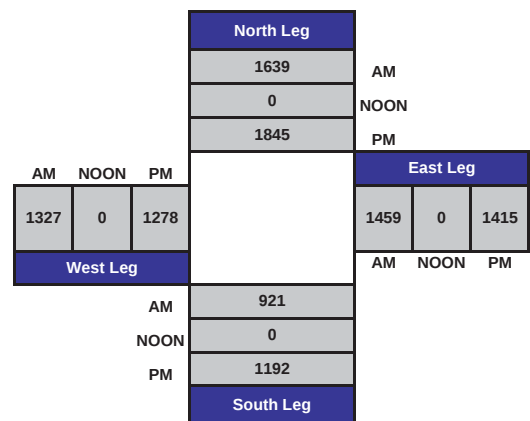
City: Riverside



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

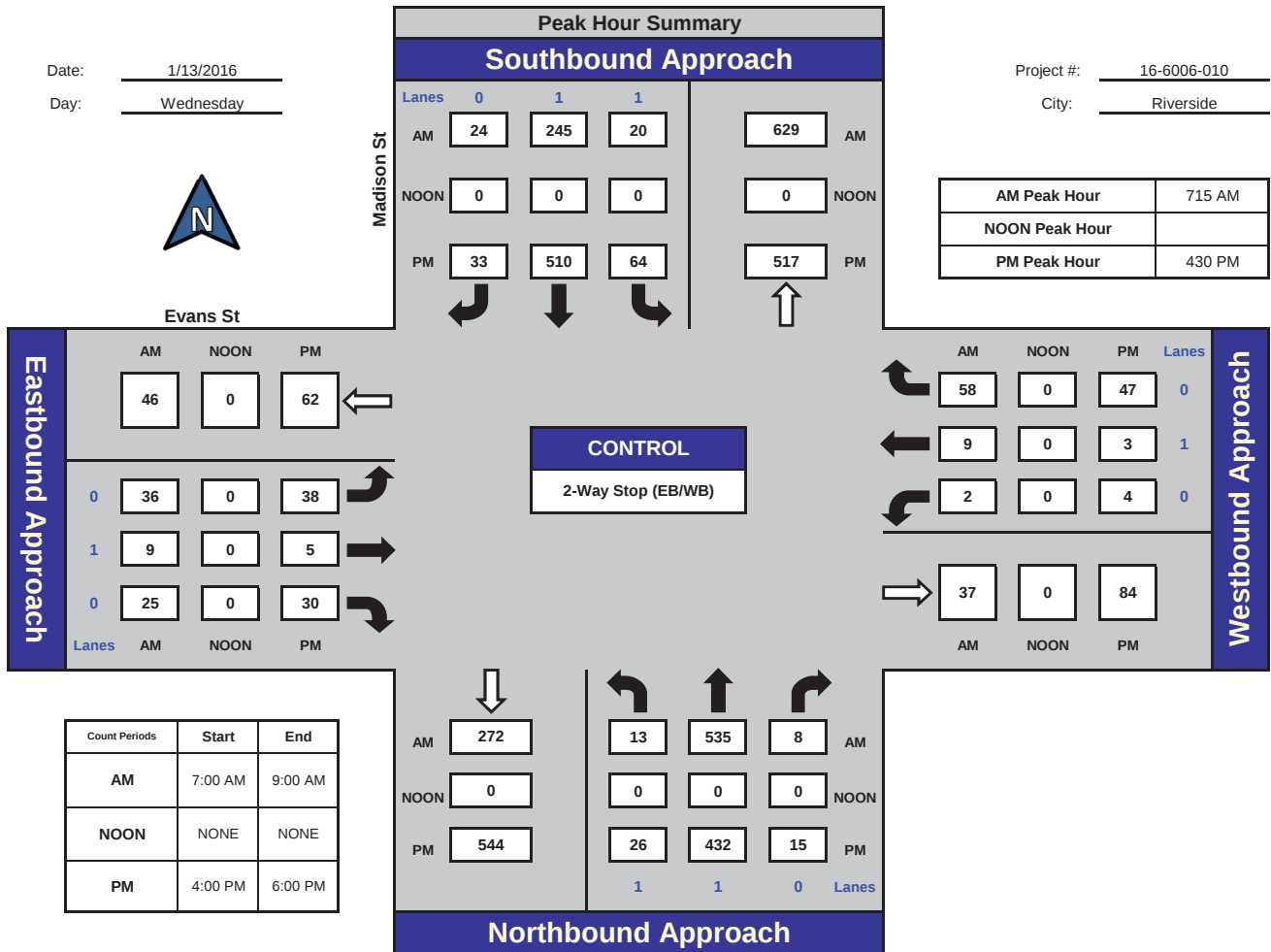


National Data & Surveying Services

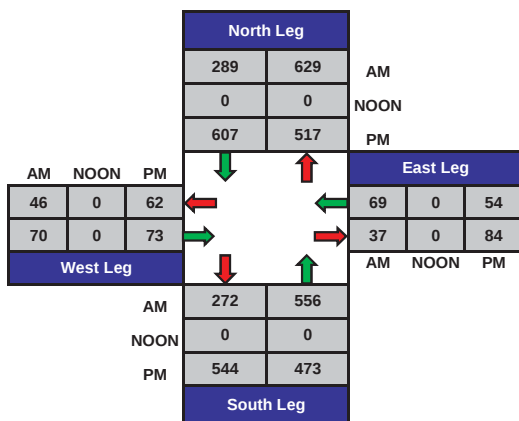
Madison St and Evans St, Riverside

Date: 1/13/2016
Day: Wednesday

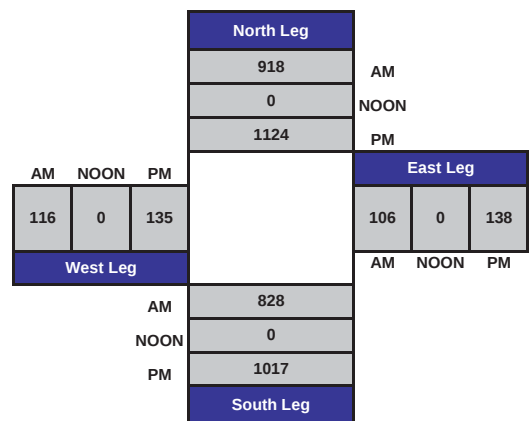
Project #: 16-6006-010
City: Riverside



Total Ins & Outs



Total Volume Per Leg



APPENDIX C:

VOLUME DEVELOPMENT WORKSHEETS

Table C-1 - Existing Peak Hour Volumes (Vehicle Classification Counts)

	A.M. Peak Hour						P.M. Peak Hour					
	Passenger Vehicles	Trucks				Total PCE Volume	Passenger Vehicles	Trucks				Total PCE Volume
		2 Axle	3 Axle	4 Axle	PCE			2 Axle	3 Axle	4 Axle	PCE	
1 Campus Avenue/16th Street												
NBL	74	2	0	0	3	77	59	0	0	0	0	59
NBT	541	9	0	0	14	555	650	3	0	0	5	655
NBR	99	0	0	0	0	99	257	1	0	0	2	259
SBL	49	0	0	0	0	49	110	1	0	1	5	115
SBT	603	6	0	2	15	618	511	0	0	1	3	514
SBR	316	6	0	0	9	325	181	2	0	0	3	184
EBL	184	2	0	0	3	187	291	0	0	0	0	291
EBT	314	8	0	0	12	326	909	3	0	0	5	914
EBR	73	2	0	0	3	76	59	0	0	0	0	59
WBL	195	3	0	0	5	200	123	1	0	0	2	125
WBT	578	8	0	0	12	590	331	3	0	0	5	336
WBR	45	1	0	0	2	47	79	0	0	1	3	82
North Leg												
Approach	968	12	0	2	24	992	802	3	0	2	11	813
Departure	770	12	0	0	18	789	1,020	3	0	1	8	1,028
Total	1,738	24	0	2	42	1,781	1,822	6	0	3	18	1,841
South Leg												
Approach	714	11	0	0	17	731	966	4	0	0	6	973
Departure	871	11	0	2	23	894	693	1	0	1	5	698
Total	1,585	22	0	2	39	1,625	1,659	5	0	1	11	1,671
East Leg												
Approach	818	12	0	0	18	837	533	4	0	1	9	543
Departure	462	8	0	0	12	474	1,276	5	0	1	11	1,288
Total	1,280	20	0	0	30	1,311	1,809	9	0	2	20	1,831
West Leg												
Approach	571	12	0	0	18	589	1,259	3	0	0	5	1,264
Departure	968	16	0	0	24	992	571	5	0	0	8	579
Total	1,539	28	0	0	42	1,581	1,830	8	0	0	12	1,843
Total Approaches												
Approach	3,071	47	0	2	77	3,149	3,560	14	0	3	30	3,593
Departure	3,071	47	0	2	77	3,149	3,560	14	0	3	30	3,593
Total	6,142	94	0	4	153	6,298	7,120	28	0	6	60	7,186

Table C-2 - Existing Peak Hour Truck Percentages

	A.M. Peak Hour				P.M. Peak Hour			
	Passenger Vehicles	Total Trucks	Total Vehicle Volume	Truck %	Passenger Vehicles	Total Trucks	Total Vehicle Volume	Truck %
1 Campus Avenue/16th Street								
NBL	74	2	76		59	0	59	
NBT	541	9	550		650	3	653	
NBR	99	0	99		257	1	258	
SBL	49	0	49		110	2	112	
SBT	603	8	611		511	1	512	
SBR	316	6	322		181	2	183	
EBL	184	2	186		291	0	291	
EBT	314	8	322		909	3	912	
EBR	73	2	75		59	0	59	
WBL	195	3	198		123	1	124	
WBT	578	8	586		331	3	334	
WBR	45	1	46		79	1	80	
North Leg								
Approach	968	14	982		802	5	807	
Departure	770	12	782		1,020	4	1,024	
Total	1,738	26	1,764	1.5%	1,822	9	1,831	0.5%
South Leg								
Approach	714	11	725		966	4	970	
Departure	871	13	884		693	2	695	
Total	1,585	24	1,609	1.5%	1,659	6	1,665	0.4%
East Leg								
Approach	818	12	830		533	5	538	
Departure	462	8	470		1,276	6	1,282	
Total	1,280	20	1,300	1.5%	1,809	11	1,820	0.6%
West Leg								
Approach	571	12	583		1,259	3	1,262	
Departure	968	16	984		571	5	576	
Total	1,539	28	1,567	1.8%	1,830	8	1,838	0.4%
Total Approaches								
Approach	3,071	49	3,120		3,560	17	3,577	
Departure	3,071	49	3,120		3,560	17	3,577	
Total	6,142	98	6,240	1.6%	7,120	34	7,154	0.5%

Table C-3 - Existing Peak Hour Volumes (Intersections Without Classification Counts)

		A.M. Peak Hour					P.M. Peak Hour					
		Total Vehicles	Truck %	Pass. Veh.	Truck PCE	Total PCE Volume	Total Vehicles	Truck %	Pass. Veh.	Truck PCE	Total PCE Volume	
2	Upland Hills Drive/Proj. Driveway 1											
NBL	45		45	0	0	45	52		52	0	0	52
NBT	36		36	0	0	36	73		73	0	0	73
NBR	30		30	0	0	30	10		10	0	0	10
SBL	2		2	0	0	2	0		0	0	0	0
SBT	47		47	0	0	47	39		39	0	0	39
SBR	1		1	0	0	1	2		2	0	0	2
EBL	1		1	0	0	1	3		3	0	0	3
EBT	1		1	0	0	1	0		0	0	0	0
EBR	11		11	0	0	11	23		23	0	0	23
WBL	13		13	0	0	13	21		21	0	0	21
WBT	3		3	0	0	3	2		2	0	0	2
WBR	2		2	0	0	2	1		1	0	0	1
North Leg												
Approach	50		50	0	0	50	41		41	0	0	41
Departure	39		39	0	0	39	77		77	0	0	77
Total	89		89	0	0	89	118		118	0	0	118
South Leg												
Approach	111		111	0	0	111	135		135	0	0	135
Departure	71		71	0	0	71	83		83	0	0	83
Total	182		182	0	0	182	218		218	0	0	218
East Leg												
Approach	18		18	0	0	18	24		24	0	0	24
Departure	33		33	0	0	33	10		10	0	0	10
Total	51		51	0	0	51	34		34	0	0	34
West Leg												
Approach	13		13	0	0	13	26		26	0	0	26
Departure	49		49	0	0	49	56		56	0	0	56
Total	62		62	0	0	62	82		82	0	0	82
Total Approaches												
Approach	192		192	0	0	192	226		226	0	0	226
Departure	192		192	0	0	192	226		226	0	0	226
Total	384		384	0	0	384	452		452	0	0	452

Table C-3 - Existing Peak Hour Volumes (Intersections Without Classification Counts)

		A.M. Peak Hour					P.M. Peak Hour					
		Total Vehicles	Truck %	Pass. Veh.	Truck PCE	Total PCE Volume	Total Vehicles	Truck %	Pass. Veh.	Truck PCE	Total PCE Volume	
3	Upland Hills Drive/16th Street											
NBL	23		23	0	0	23	9		9	0	9	
NBT	3		3	0	0	3	2		2	0	2	
NBR	4		4	0	0	4	5		5	0	5	
SBL	25		25	0	0	25	43		43	0	43	
SBT	1		1	0	0	1	1		1	0	1	
SBR	34		34	0	0	34	44		44	0	44	
EBL	78		78	0	0	78	89		89	0	89	
EBT	404	1.5%	398	6	12	410	1,165	1.5%	1,147	18	36	1,183
EBR	10		10	0	0	10	29		29	0	29	
WBL	2		2	0	0	2	9		9	0	9	
WBT	757	1.5%	745	12	23	769	460	1.5%	453	7	14	467
WBR	26		26	0	0	26	41		41	0	41	
North Leg												
Approach	60		60	0	0	60	88		88	0	0	88
Departure	107		107	0	0	107	132		132	0	0	132
Total	167		167	0	0	167	220		220	0	0	220
South Leg												
Approach	30		30	0	0	30	16		16	0	0	16
Departure	13		13	0	0	13	39		39	0	0	39
Total	43		43	0	0	43	55		55	0	0	55
East Leg												
Approach	785		773	12	23	797	510		503	7	14	517
Departure	433		427	6	12	439	1,213		1,195	18	36	1,231
Total	1,218		1,200	18	36	1,236	1,723		1,698	25	50	1,748
West Leg												
Approach	492		486	6	12	498	1,283		1,265	18	36	1,301
Departure	814		802	12	23	826	513		506	7	14	520
Total	1,306		1,288	18	36	1,324	1,796		1,771	25	50	1,821
Total Approaches												
Approach	1,367		1,349	18	36	1,385	1,897		1,872	25	50	1,922
Departure	1,367		1,349	18	36	1,385	1,897		1,872	25	50	1,922
Total	2,734		2,698	36	71	2,770	3,794		3,744	50	100	3,844

Table C-4 - Existing Peak Hour Volume Summary

	A.M. Peak Hour			P.M. Peak Hour		
	Passenger Vehicles	Truck PCE	Total PCE Volume	Passenger Vehicles	Truck PCE	Total PCE Volume
1 Campus Avenue/16th Street						
NBL	74	3	77	59	0	59
NBT	541	14	555	650	5	655
NBR	99	0	99	257	2	259
SBL	49	0	49	110	5	115
SBT	603	15	618	511	3	514
SBR	316	9	325	181	3	184
EBL	184	3	187	291	0	291
EBT	314	12	326	909	5	914
EBR	73	3	76	59	0	59
WBL	195	5	200	123	2	125
WBT	578	12	590	331	5	336
WBR	45	2	47	79	3	82
North Leg						
Approach	968	24	992	802	11	813
Departure	770	18	789	1,020	8	1,028
Total	1,738	42	1,781	1,822	18	1,841
South Leg						
Approach	714	17	731	966	6	973
Departure	871	23	894	693	5	698
Total	1,585	39	1,625	1,659	11	1,671
East Leg						
Approach	818	18	837	533	9	543
Departure	462	12	474	1,276	11	1,288
Total	1,280	30	1,311	1,809	20	1,831
West Leg						
Approach	571	18	589	1,259	5	1,264
Departure	968	24	992	571	8	579
Total	1,539	42	1,581	1,830	12	1,843
Total Approaches						
Approach	3,071	77	3,149	3,560	30	3,593
Departure	3,071	77	3,149	3,560	30	3,593
Total	6,142	153	6,298	7,120	60	7,186

Table C-4 - Existing Peak Hour Volume Summary

	A.M. Peak Hour			P.M. Peak Hour		
	Passenger Vehicles	Truck PCE	Total PCE Volume	Passenger Vehicles	Truck PCE	Total PCE Volume
2 Upland Hills Drive/Proj. Driveway 1						
NBL	45	0	45	52	0	52
NBT	36	0	36	73	0	73
NBR	30	0	30	10	0	10
SBL	2	0	2	0	0	0
SBT	47	0	47	39	0	39
SBR	1	0	1	2	0	2
EBL	1	0	1	3	0	3
EBT	1	0	1	0	0	0
EBR	11	0	11	23	0	23
WBL	13	0	13	21	0	21
WBT	3	0	3	2	0	2
WBR	2	0	2	1	0	1
North Leg						
Approach	50	0	50	41	0	41
Departure	39	0	39	77	0	77
Total	89	0	89	118	0	118
South Leg						
Approach	111	0	111	135	0	135
Departure	71	0	71	83	0	83
Total	182	0	182	218	0	218
East Leg						
Approach	18	0	18	24	0	24
Departure	33	0	33	10	0	10
Total	51	0	51	34	0	34
West Leg						
Approach	13	0	13	26	0	26
Departure	49	0	49	56	0	56
Total	62	0	62	82	0	82
Total Approaches						
Approach	192	0	192	226	0	226
Departure	192	0	192	226	0	226
Total	384	0	384	452	0	452

Table C-4 - Existing Peak Hour Volume Summary

	A.M. Peak Hour			P.M. Peak Hour		
	Passenger Vehicles	Truck PCE	Total PCE Volume	Passenger Vehicles	Truck PCE	Total PCE Volume
3 Upland Hills Drive/16th Street						
NBL	23	0	23	9	0	9
NBT	3	0	3	2	0	2
NBR	4	0	4	5	0	5
SBL	25	0	25	43	0	43
SBT	1	0	1	1	0	1
SBR	34	0	34	44	0	44
EBL	78	0	78	89	0	89
EBT	398	12	410	1,147	36	1,183
EBR	10	0	10	29	0	29
WBL	2	0	2	9	0	9
WBT	745	23	769	453	14	467
WBR	26	0	26	41	0	41
North Leg						
Approach	60	0	60	88	0	88
Departure	107	0	107	132	0	132
Total	167	0	167	220	0	220
South Leg						
Approach	30	0	30	16	0	16
Departure	13	0	13	39	0	39
Total	43	0	43	55	0	55
East Leg						
Approach	773	23	797	503	14	517
Departure	427	12	439	1,195	36	1,231
Total	1,200	36	1,236	1,698	50	1,748
West Leg						
Approach	486	12	498	1,265	36	1,301
Departure	802	23	826	506	14	520
Total	1,288	36	1,324	1,771	50	1,821
Total Approaches						
Approach	1,349	36	1,385	1,872	50	1,922
Departure	1,349	36	1,385	1,872	50	1,922
Total	2,698	71	2,770	3,744	100	3,844

Table C-4 - Existing Peak Hour Volume Summary

	A.M. Peak Hour			P.M. Peak Hour		
	Passenger Vehicles	Truck PCE	Total PCE Volume	Passenger Vehicles	Truck PCE	Total PCE Volume
4 Proj. Driveway 2/16th Street						
NBL	0	0	0	0	0	0
NBT	0	0	0	0	0	0
NBR	0	0	0	0	0	0
SBL	0	0	0	0	0	0
SBT	0	0	0	0	0	0
SBR	0	0	0	0	0	0
EBL	0	0	0	0	0	0
EBT	428	13	442	1,203	38	1,241
EBR	0	0	0	0	0	0
WBL	0	0	0	0	0	0
WBT	777	24	801	491	15	507
WBR	0	0	0	0	0	0
North Leg						
Approach	0	0	0	0	0	0
Departure	0	0	0	0	0	0
Total	0	0	0	0	0	0
South Leg						
Approach	0	0	0	0	0	0
Departure	0	0	0	0	0	0
Total	0	0	0	0	0	0
East Leg						
Approach	777	24	801	491	15	507
Departure	428	13	442	1,203	38	1,241
Total	1,205	38	1,243	1,695	53	1,748
West Leg						
Approach	428	13	442	1,203	38	1,241
Departure	777	24	801	491	15	507
Total	1,205	38	1,243	1,695	53	1,748
Total Approaches						
Approach	1,205	38	1,243	1,695	53	1,748
Departure	1,205	38	1,243	1,695	53	1,748
Total	2,410	75	2,486	3,389	106	3,496

Table C-5
Balance of Existing Peak Hour Volumes
To Maintain Consistent Flow of Vehicles

		A.M. Peak Hour Volumes			P.M. Peak Hour Volumes		
		PCE		Balanced	PCE		Balanced
		Volume	Adjust.	Volume	Volume	adjus	Volume
1	Campus Avenue/16th Street						
	NBL	77		77	59		59
	NBT	555		555	655		655
	NBR	99	6	105	259	5	264
	SBL	49	3	52	115	2	117
	SBT	618		618	514		514
	SBR	325		325	184		184
	EBL	187		187	291		291
	EBT	326	19	345	914	16	930
	EBR	76		76	59		59
	WBL	200	-2	198	125	-7	118
	WBT	590	-5	585	336	-20	316
	WBR	47		47	82	-5	77
North Leg							
	Approach	992	3	995	813	2	815
	Departure	789	0	789	1,028	-5	1,023
	Total	1,781	3	1,784	1,841	-3	1,838
South Leg							
	Approach	731	6	737	973	5	978
	Departure	894	-2	892	698	-7	691
	Total	1,625	4	1,629	1,671	-2	1,669
East Leg							
	Approach	837	-7	830	543	-32	511
	Departure	474	28	502	1,288	23	1,311
	Total	1,311	21	1,332	1,831	-9	1,822
West Leg							
	Approach	589	19	608	1,264	16	1,280
	Departure	992	-5	987	579	-20	559
	Total	1,581	14	1,595	1,843	-4	1,839
Total Approaches							
	Approach	3,149	21	3,170	3,593	-9	3,584
	Departure	3,149	21	3,170	3,593	-9	3,584
	Total	6,298	42	6,340	7,186	-18	7,168

Table C-5
Balance of Existing Peak Hour Volumes
To Maintain Consistent Flow of Vehicles

		A.M. Peak Hour Volumes			P.M. Peak Hour Volumes		
		PCE		Balanced	PCE		Balanced
		Volume	Adjust.	Volume	Volume	Adjus	Volume
3	Upland Hills Drive/16th Street						
	NBL	23		23	9		9
	NBT	3		3	2		2
	NBR	4		4	5		5
	SBL	25		25	43		43
	SBT	1		1	1		1
	SBR	34		34	44		44
	EBL	78		78	89		89
	EBT	410	3	413	1,183	10	1,193
	EBR	10		10	29		29
	WBL	2		2	9		9
	WBT	769	4	773	467	-9	458
	WBR	26		26	41	-1	40
North Leg							
	Approach	60	0	60	88	0	88
	Departure	107	0	107	132	-1	131
	Total	167	0	167	220	-1	219
South Leg							
	Approach	30	0	30	16	0	16
	Departure	13	0	13	39	0	39
	Total	43	0	43	55	0	55
East Leg							
	Approach	797	4	801	517	-10	507
	Departure	439	3	442	1,231	10	1,241
	Total	1,236	7	1,243	1,748	0	1,748
West Leg							
	Approach	498	3	501	1,301	10	1,311
	Departure	826	4	830	520	-9	511
	Total	1,324	7	1,331	1,821	1	1,822
Total Approaches							
	Approach	1,385	7	1,392	1,922	0	1,922
	Departure	1,385	7	1,392	1,922	0	1,922
	Total	2,770	14	2,784	3,844	0	3,844

Table C-6 - Existing With Project (Access Alternative 1) Peak Hour Volume Summary

	AM Peak Hour			PM Peak Hour		
	Existing PCE Volume	Project Trips	Existing With Project PCE Volume	Existing PCE Volume	Project Trips	Existing With Project PCE Volume
1 Campus Avenue/16th Street						
NBL	77	0	77	59	0	59
NBT	555	0	555	655	0	655
NBR	105	1	106	264	4	268
SBL	52	5	57	117	17	134
SBT	618	0	618	514	0	514
SBR	325	0	325	184	0	184
EBL	187	0	187	291	0	291
EBT	345	4	349	930	13	943
EBR	76	0	76	59	0	59
WBL	198	4	202	118	2	120
WBT	585	11	596	316	8	324
WBR	47	15	62	77	10	87
North Leg						
Approach	995	5	1,000	815	17	832
Departure	789	15	804	1,023	10	1,033
Total	1,784	20	1,804	1,838	27	1,865
South Leg						
Approach	737	1	738	978	4	982
Departure	892	4	896	691	2	693
Total	1,629	5	1,634	1,669	6	1,675
East Leg						
Approach	830	30	860	511	20	531
Departure	502	10	512	1,311	34	1,345
Total	1,332	40	1,372	1,822	54	1,876
West Leg						
Approach	608	4	612	1,280	13	1,293
Departure	987	11	998	559	8	567
Total	1,595	15	1,610	1,839	21	1,860
Total Approaches						
Approach	3,170	40	3,210	3,584	54	3,638
Departure	3,170	40	3,210	3,584	54	3,638
Total	6,340	80	6,420	7,168	108	7,276

Table C-6 - Existing With Project (Access Alternative 1) Peak Hour Volume Summary

	AM Peak Hour			PM Peak Hour		
	Existing PCE Volume	Project Trips	Existing With Project PCE Volume	Existing PCE Volume	Project Trips	Existing With Project PCE Volume
2 Upland Hills Drive/Proj. Driveway 1						
NBL	45	0	45	52	0	52
NBT	36	0	36	73	0	73
NBR	30	13	43	10	43	53
SBL	2	0	2	0	0	0
SBT	47	0	47	39	0	39
SBR	1	0	1	2	0	2
EBL	1	0	1	3	0	3
EBT	1	0	1	0	0	0
EBR	11	0	11	23	0	23
WBL	13	30	43	21	20	41
WBT	3	0	3	2	0	2
WBR	2	0	2	1	0	1
North Leg						
Approach	50	0	50	41	0	41
Departure	39	0	39	77	0	77
Total	89	0	89	118	0	118
South Leg						
Approach	111	13	124	135	43	178
Departure	71	30	101	83	20	103
Total	182	43	225	218	63	281
East Leg						
Approach	18	30	48	24	20	44
Departure	33	13	46	10	43	53
Total	51	43	94	34	63	97
West Leg						
Approach	13	0	13	26	0	26
Departure	49	0	49	56	0	56
Total	62	0	62	82	0	82
Total Approaches						
Approach	192	43	235	226	63	289
Departure	192	43	235	226	63	289
Total	384	86	470	452	126	578

Table C-6 - Existing With Project (Access Alternative 1) Peak Hour Volume Summary

	AM Peak Hour			PM Peak Hour		
	Existing PCE Volume	Project Trips	Existing With Project PCE Volume	Existing PCE Volume	Project Trips	Existing With Project PCE Volume
3 Upland Hills Drive/16th Street						
NBL	23	0	23	9	0	9
NBT	3	0	3	2	0	2
NBR	4	0	4	5	0	5
SBL	25	8	33	43	5	48
SBT	1	0	1	1	0	1
SBR	34	22	56	44	15	59
EBL	78	10	88	89	34	123
EBT	413	0	413	1,193	0	1,193
EBR	10	0	10	29	0	29
WBL	2	0	2	9	0	9
WBT	773	8	781	458	5	463
WBR	26	3	29	40	9	49
North Leg						
Approach	60	30	90	88	20	108
Departure	107	13	120	131	43	174
Total	167	43	210	219	63	282
South Leg						
Approach	30	0	30	16	0	16
Departure	13	0	13	39	0	39
Total	43	0	43	55	0	55
East Leg						
Approach	801	11	812	507	14	521
Departure	442	8	450	1,241	5	1,246
Total	1,243	19	1,262	1,748	19	1,767
West Leg						
Approach	501	10	511	1,311	34	1,345
Departure	830	30	860	511	20	531
Total	1,331	40	1,371	1,822	54	1,876
Total Approaches						
Approach	1,392	51	1,443	1,922	68	1,990
Departure	1,392	51	1,443	1,922	68	1,990
Total	2,784	102	2,886	3,844	136	3,980

Table C-6 - Existing With Project (Access Alternative 1) Peak Hour Volume Summary

	AM Peak Hour			PM Peak Hour		
	Existing PCE Volume	Project Trips	Existing With Project PCE Volume	Existing PCE Volume	Project Trips	Existing With Project PCE Volume
4 Proj. Driveway 2/16th Street						
NBL	0	0	0	0	0	0
NBT	0	0	0	0	0	0
NBR	0	0	0	0	0	0
SBL	0	0	0	0	0	0
SBT	0	0	0	0	0	0
SBR	0	8	8	0	5	5
EBL	0	0	0	0	0	0
EBT	442	8	450	1,241	5	1,246
EBR	0	0	0	0	0	0
WBL	0	0	0	0	0	0
WBT	801	3	804	507	9	516
WBR	0	0	0	0	0	0
North Leg						
Approach	0	8	8	0	5	5
Departure	0	0	0	0	0	0
Total	0	8	8	0	5	5
South Leg						
Approach	0	0	0	0	0	0
Departure	0	0	0	0	0	0
Total	0	0	0	0	0	0
East Leg						
Approach	801	3	804	507	9	516
Departure	442	8	450	1,241	5	1,246
Total	1,243	11	1,254	1,748	14	1,762
West Leg						
Approach	442	8	450	1,241	5	1,246
Departure	801	11	812	507	14	521
Total	1,243	19	1,262	1,748	19	1,767
Total Approaches						
Approach	1,243	19	1,262	1,748	19	1,767
Departure	1,243	19	1,262	1,748	19	1,767
Total	2,486	38	2,524	3,496	38	3,534

Table C-7 - Opening Year With Project (Access Alternative 1) Peak Hour PCE Volume Summary

	AM Peak Hour						PM Peak Hour					
	Existing PCE Volume	Ambient Growth	Cumulative Projects	OY No Project	Project Trips	OY With Project	Existing PCE Volume	Ambient Growth	Cumulative Projects	OY No Project	Project Trips	OY With Project
1 Campus Avenue/16th Street												
NBL	77	2	1	80	0	80	59	1	2	62	0	62
NBT	555	11	27	593	0	593	655	13	61	729	0	729
NBR	105	2	0	107	1	108	264	5	1	270	4	274
SBL	52	1	6	59	5	64	117	2	11	130	17	147
SBT	618	12	46	676	0	676	514	10	40	564	0	564
SBR	325	7	6	338	0	338	184	4	11	199	0	199
EBL	187	4	8	199	0	199	291	6	9	306	0	306
EBT	345	7	4	356	4	360	930	19	3	952	13	965
EBR	76	2	2	80	0	80	59	1	2	62	0	62
WBL	198	4	1	203	4	207	118	2	1	121	2	123
WBT	585	12	1	598	11	609	316	6	5	327	8	335
WBR	47	1	8	56	15	71	77	2	9	88	10	98
North Leg												
Approach	995	20	58	1,073	5	1,078	815	16	62	893	17	910
Departure	789	16	43	848	15	863	1,023	21	79	1,123	10	1,133
Total	1,784	36	101	1,921	20	1,941	1,838	37	141	2,016	27	2,043
South Leg												
Approach	737	15	28	780	1	781	978	19	64	1,061	4	1,065
Departure	892	18	49	959	4	963	691	13	43	747	2	749
Total	1,629	33	77	1,739	5	1,744	1,669	32	107	1,808	6	1,814
East Leg												
Approach	830	17	10	857	30	887	511	10	15	536	20	556
Departure	502	10	10	522	10	532	1,311	26	15	1,352	34	1,386
Total	1,332	27	20	1,379	40	1,419	1,822	36	30	1,888	54	1,942
West Leg												
Approach	608	13	14	635	4	639	1,280	26	14	1,320	13	1,333
Departure	987	21	8	1,016	11	1,027	559	11	18	588	8	596
Total	1,595	34	22	1,651	15	1,666	1,839	37	32	1,908	21	1,929
Total Approaches												
Approach	3,170	65	110	3,345	40	3,385	3,584	71	155	3,810	54	3,864
Departure	3,170	65	110	3,345	40	3,385	3,584	71	155	3,810	54	3,864
Total	6,340	130	220	6,690	80	6,770	7,168	142	310	7,620	108	7,728

Table C-7 - Opening Year With Project (Access Alternative 1) Peak Hour PCE Volume Summary

	AM Peak Hour						PM Peak Hour					
	Existing PCE Volume	Ambient Growth	Cumulative Projects	OY No Project	Project Trips	OY With Project	Existing PCE Volume	Ambient Growth	Cumulative Projects	OY No Project	Project Trips	OY With Project
2 Upland Hills Drive/Proj. Driveway 1												
NBL	45	1	0	46	0	46	52	1	0	53	0	53
NBT	36	1	0	37	0	37	73	1	0	74	0	74
NBR	30	1	0	31	13	44	10	0	0	10	43	53
SBL	2	0	0	2	0	2	0	0	0	0	0	0
SBT	47	1	0	48	0	48	39	1	0	40	0	40
SBR	1	0	0	1	0	1	2	0	0	2	0	2
EBL	1	0	0	1	0	1	3	0	0	3	0	3
EBT	1	0	0	1	0	1	0	0	0	0	0	0
EBR	11	0	0	11	0	11	23	0	0	23	0	23
WBL	13	0	0	13	30	43	21	0	0	21	20	41
WBT	3	0	0	3	0	3	2	0	0	2	0	2
WBR	2	0	0	2	0	2	1	0	0	1	0	1
North Leg												
Approach	50	1	0	51	0	51	41	1	0	42	0	42
Departure	39	1	0	40	0	40	77	1	0	78	0	78
Total	89	2	0	91	0	91	118	2	0	120	0	120
South Leg												
Approach	111	3	0	114	13	127	135	2	0	137	43	180
Departure	71	1	0	72	30	102	83	1	0	84	20	104
Total	182	4	0	186	43	229	218	3	0	221	63	284
East Leg												
Approach	18	0	0	18	30	48	24	0	0	24	20	44
Departure	33	1	0	34	13	47	10	0	0	10	43	53
Total	51	1	0	52	43	95	34	0	0	34	63	97
West Leg												
Approach	13	0	0	13	0	13	26	0	0	26	0	26
Departure	49	1	0	50	0	50	56	1	0	57	0	57
Total	62	1	0	63	0	63	82	1	0	83	0	83
Total Approaches												
Approach	192	4	0	196	43	239	226	3	0	229	63	292
Departure	192	4	0	196	43	239	226	3	0	229	63	292
Total	384	8	0	392	86	478	452	6	0	458	126	584

Table C-7 - Opening Year With Project (Access Alternative 1) Peak Hour PCE Volume Summary

	AM Peak Hour						PM Peak Hour					
	Existing PCE Volume	Ambient Growth	Cumulative Projects	OY No Project	Project Trips	OY With Project	Existing PCE Volume	Ambient Growth	Cumulative Projects	OY No Project	Project Trips	OY With Project
3 Upland Hills Drive/16th Street												
NBL	23	0	0	23	0	23	9	0	0	9	0	9
NBT	3	0	0	3	0	3	2	0	0	2	0	2
NBR	4	0	0	4	0	4	5	0	0	5	0	5
SBL	25	1	0	26	8	34	43	1	0	44	5	49
SBT	1	0	0	1	0	1	1	0	0	1	0	1
SBR	34	1	0	35	22	57	44	1	0	45	15	60
EBL	78	2	0	80	10	90	89	2	0	91	34	125
EBT	413	8	10	431	0	431	1,193	24	15	1,232	0	1,232
EBR	10	0	0	10	0	10	29	1	0	30	0	30
WBL	2	0	0	2	0	2	9	0	0	9	0	9
WBT	773	15	10	798	8	806	458	9	15	482	5	487
WBR	26	1	0	27	3	30	40	1	0	41	9	50
North Leg												
Approach	60	2	0	62	30	92	88	2	0	90	20	110
Departure	107	3	0	110	13	123	131	3	0	134	43	177
Total	167	5	0	172	43	215	219	5	0	224	63	287
South Leg												
Approach	30	0	0	30	0	30	16	0	0	16	0	16
Departure	13	0	0	13	0	13	39	1	0	40	0	40
Total	43	0	0	43	0	43	55	1	0	56	0	56
East Leg												
Approach	801	16	10	827	11	838	507	10	15	532	14	546
Departure	442	9	10	461	8	469	1,241	25	15	1,281	5	1,286
Total	1,243	25	20	1,288	19	1,307	1,748	35	30	1,813	19	1,832
West Leg												
Approach	501	10	10	521	10	531	1,311	27	15	1,353	34	1,387
Departure	830	16	10	856	30	886	511	10	15	536	20	556
Total	1,331	26	20	1,377	40	1,417	1,822	37	30	1,889	54	1,943
Total Approaches												
Approach	1,392	28	20	1,440	51	1,491	1,922	39	30	1,991	68	2,059
Departure	1,392	28	20	1,440	51	1,491	1,922	39	30	1,991	68	2,059
Total	2,784	56	40	2,880	102	2,982	3,844	78	60	3,982	136	4,118

Table C-7 - Opening Year With Project (Access Alternative 1) Peak Hour PCE Volume Summary

	AM Peak Hour						PM Peak Hour					
	Existing PCE Volume	Ambient Growth	Cumulative Projects	OY No Project	Project Trips	OY With Project	Existing PCE Volume	Ambient Growth	Cumulative Projects	OY No Project	Project Trips	OY With Project
4 Proj. Driveway 2/16th Street												
NBL	0	0	0	0	0	0	0	0	0	0	0	0
NBT	0	0	0	0	0	0	0	0	0	0	0	0
NBR	0	0	0	0	0	0	0	0	0	0	0	0
SBL	0	0	0	0	0	0	0	0	0	0	0	0
SBT	0	0	0	0	0	0	0	0	0	0	0	0
SBR	0	0	0	0	8	8	0	0	0	0	5	5
EBL	0	0	0	0	0	0	0	0	0	0	0	0
EBT	442	9	10	461	8	469	1,241	25	15	1,281	5	1,286
EBR	0	0	0	0	0	0	0	0	0	0	0	0
WBL	0	0	0	0	0	0	0	0	0	0	0	0
WBT	801	16	10	827	3	830	507	10	15	532	9	541
WBR	0	0	0	0	0	0	0	0	0	0	0	0
North Leg												
Approach	0	0	0	0	8	8	0	0	0	0	5	5
Departure	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	8	8	0	0	0	0	5	5
South Leg												
Approach	0	0	0	0	0	0	0	0	0	0	0	0
Departure	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
East Leg												
Approach	801	16	10	827	3	830	507	10	15	532	9	541
Departure	442	9	10	461	8	469	1,241	25	15	1,281	5	1,286
Total	1,243	25	20	1,288	11	1,299	1,748	35	30	1,813	14	1,827
West Leg												
Approach	442	9	10	461	8	469	1,241	25	15	1,281	5	1,286
Departure	801	16	10	827	11	838	507	10	15	532	14	546
Total	1,243	25	20	1,288	19	1,307	1,748	35	30	1,813	19	1,832
Total Approaches												
Approach	1,243	25	20	1,288	19	1,307	1,748	35	30	1,813	19	1,832
Departure	1,243	25	20	1,288	19	1,307	1,748	35	30	1,813	19	1,832
Total	2,486	50	40	2,576	38	2,614	3,496	70	60	3,626	38	3,664

Table C-8 - Existing With Project (Access Alternative 2) Peak Hour Volume Summary

	AM Peak Hour			PM Peak Hour		
	Existing PCE Volume	Project Trips	Existing With Project PCE Volume	Existing PCE Volume	Project Trips	Existing With Project PCE Volume
1 Campus Avenue/16th Street						
NBL	77	0	77	59	0	59
NBT	555	0	555	655	0	655
NBR	105	1	106	264	4	268
SBL	52	5	57	117	17	134
SBT	618	0	618	514	0	514
SBR	325	0	325	184	0	184
EBL	187	0	187	291	0	291
EBT	345	4	349	930	13	943
EBR	76	0	76	59	0	59
WBL	198	4	202	118	2	120
WBT	585	11	596	316	8	324
WBR	47	15	62	77	10	87
North Leg						
Approach	995	5	1,000	815	17	832
Departure	789	15	804	1,023	10	1,033
Total	1,784	20	1,804	1,838	27	1,865
South Leg						
Approach	737	1	738	978	4	982
Departure	892	4	896	691	2	693
Total	1,629	5	1,634	1,669	6	1,675
East Leg						
Approach	830	30	860	511	20	531
Departure	502	10	512	1,311	34	1,345
Total	1,332	40	1,372	1,822	54	1,876
West Leg						
Approach	608	4	612	1,280	13	1,293
Departure	987	11	998	559	8	567
Total	1,595	15	1,610	1,839	21	1,860
Total Approaches						
Approach	3,170	40	3,210	3,584	54	3,638
Departure	3,170	40	3,210	3,584	54	3,638
Total	6,340	80	6,420	7,168	108	7,276

Table C-8 - Existing With Project (Access Alternative 2) Peak Hour Volume Summary

	AM Peak Hour			PM Peak Hour		
	Existing PCE Volume	Project Trips	Existing With Project PCE Volume	Existing PCE Volume	Project Trips	Existing With Project PCE Volume
2 Upland Hills Drive/Proj. Driveway 1						
NBL	45	0	45	52	0	52
NBT	36	0	36	73	0	73
NBR	30	13	43	10	43	53
SBL	2	0	2	0	0	0
SBT	47	0	47	39	0	39
SBR	1	0	1	2	0	2
EBL	1	0	1	3	0	3
EBT	1	0	1	0	0	0
EBR	11	0	11	23	0	23
WBL	13	38	51	21	25	46
WBT	3	0	3	2	0	2
WBR	2	0	2	1	0	1
North Leg						
Approach	50	0	50	41	0	41
Departure	39	0	39	77	0	77
Total	89	0	89	118	0	118
South Leg						
Approach	111	13	124	135	43	178
Departure	71	38	109	83	25	108
Total	182	51	233	218	68	286
East Leg						
Approach	18	38	56	24	25	49
Departure	33	13	46	10	43	53
Total	51	51	102	34	68	102
West Leg						
Approach	13	0	13	26	0	26
Departure	49	0	49	56	0	56
Total	62	0	62	82	0	82
Total Approaches						
Approach	192	51	243	226	68	294
Departure	192	51	243	226	68	294
Total	384	102	486	452	136	588

Table C-8 - Existing With Project (Access Alternative 2) Peak Hour Volume Summary

	AM Peak Hour			PM Peak Hour		
	Existing PCE Volume	Project Trips	Existing With Project PCE Volume	Existing PCE Volume	Project Trips	Existing With Project PCE Volume
3 Upland Hills Drive/16th Street						
NBL	23	0	23	9	0	9
NBT	3	0	3	2	0	2
NBR	4	0	4	5	0	5
SBL	25	8	33	43	5	48
SBT	1	0	1	1	0	1
SBR	34	30	64	44	20	64
EBL	78	10	88	89	34	123
EBT	413	0	413	1,193	0	1,193
EBR	10	0	10	29	0	29
WBL	2	0	2	9	0	9
WBT	773	0	773	458	0	458
WBR	26	3	29	40	9	49
North Leg						
Approach	60	38	98	88	25	113
Departure	107	13	120	131	43	174
Total	167	51	218	219	68	287
South Leg						
Approach	30	0	30	16	0	16
Departure	13	0	13	39	0	39
Total	43	0	43	55	0	55
East Leg						
Approach	801	3	804	507	9	516
Departure	442	8	450	1,241	5	1,246
Total	1,243	11	1,254	1,748	14	1,762
West Leg						
Approach	501	10	511	1,311	34	1,345
Departure	830	30	860	511	20	531
Total	1,331	40	1,371	1,822	54	1,876
Total Approaches						
Approach	1,392	51	1,443	1,922	68	1,990
Departure	1,392	51	1,443	1,922	68	1,990
Total	2,784	102	2,886	3,844	136	3,980

Table C-8 - Existing With Project (Access Alternative 2) Peak Hour Volume Summary

	AM Peak Hour			PM Peak Hour		
	Existing PCE Volume	Project Trips	Existing With Project PCE Volume	Existing PCE Volume	Project Trips	Existing With Project PCE Volume
4 Proj. Driveway 2/16th Street						
NBL	0	0	0	0	0	0
NBT	0	0	0	0	0	0
NBR	0	0	0	0	0	0
SBL	0	0	0	0	0	0
SBT	0	0	0	0	0	0
SBR	0	0	0	0	0	0
EBL	0	0	0	0	0	0
EBT	442	8	450	1,241	5	1,246
EBR	0	0	0	0	0	0
WBL	0	0	0	0	0	0
WBT	801	3	804	507	9	516
WBR	0	0	0	0	0	0
North Leg						
Approach	0	0	0	0	0	0
Departure	0	0	0	0	0	0
Total	0	0	0	0	0	0
South Leg						
Approach	0	0	0	0	0	0
Departure	0	0	0	0	0	0
Total	0	0	0	0	0	0
East Leg						
Approach	801	3	804	507	9	516
Departure	442	8	450	1,241	5	1,246
Total	1,243	11	1,254	1,748	14	1,762
West Leg						
Approach	442	8	450	1,241	5	1,246
Departure	801	3	804	507	9	516
Total	1,243	11	1,254	1,748	14	1,762
Total Approaches						
Approach	1,243	11	1,254	1,748	14	1,762
Departure	1,243	11	1,254	1,748	14	1,762
Total	2,486	22	2,508	3,496	28	3,524

Table C-9 - Opening Year With Project (Access Alternative 2) Peak Hour PCE Volume Summary

	AM Peak Hour						PM Peak Hour					
	Existing PCE Volume	Ambient Growth	Cumulative Projects	OY No Project	Project Trips	OY With Project	Existing PCE Volume	Ambient Growth	Cumulative Projects	OY No Project	Project Trips	OY With Project
1 Campus Avenue/16th Street												
NBL	77	2	1	80	0	80	59	1	2	62	0	62
NBT	555	11	27	593	0	593	655	13	61	729	0	729
NBR	105	2	0	107	1	108	264	5	1	270	4	274
SBL	52	1	6	59	5	64	117	2	11	130	17	147
SBT	618	12	46	676	0	676	514	10	40	564	0	564
SBR	325	7	6	338	0	338	184	4	11	199	0	199
EBL	187	4	8	199	0	199	291	6	9	306	0	306
EBT	345	7	4	356	4	360	930	19	3	952	13	965
EBR	76	2	2	80	0	80	59	1	2	62	0	62
WBL	198	4	1	203	4	207	118	2	1	121	2	123
WBT	585	12	1	598	11	609	316	6	5	327	8	335
WBR	47	1	8	56	15	71	77	2	9	88	10	98
North Leg												
Approach	995	20	58	1,073	5	1,078	815	16	62	893	17	910
Departure	789	16	43	848	15	863	1,023	21	79	1,123	10	1,133
Total	1,784	36	101	1,921	20	1,941	1,838	37	141	2,016	27	2,043
South Leg												
Approach	737	15	28	780	1	781	978	19	64	1,061	4	1,065
Departure	892	18	49	959	4	963	691	13	43	747	2	749
Total	1,629	33	77	1,739	5	1,744	1,669	32	107	1,808	6	1,814
East Leg												
Approach	830	17	10	857	30	887	511	10	15	536	20	556
Departure	502	10	10	522	10	532	1,311	26	15	1,352	34	1,386
Total	1,332	27	20	1,379	40	1,419	1,822	36	30	1,888	54	1,942
West Leg												
Approach	608	13	14	635	4	639	1,280	26	14	1,320	13	1,333
Departure	987	21	8	1,016	11	1,027	559	11	18	588	8	596
Total	1,595	34	22	1,651	15	1,666	1,839	37	32	1,908	21	1,929
Total Approaches												
Approach	3,170	65	110	3,345	40	3,385	3,584	71	155	3,810	54	3,864
Departure	3,170	65	110	3,345	40	3,385	3,584	71	155	3,810	54	3,864
Total	6,340	130	220	6,690	80	6,770	7,168	142	310	7,620	108	7,728

Table C-9 - Opening Year With Project (Access Alternative 2) Peak Hour PCE Volume Summary

	AM Peak Hour						PM Peak Hour					
	Existing PCE Volume	Ambient Growth	Cumulative Projects	OY No Project	Project Trips	OY With Project	Existing PCE Volume	Ambient Growth	Cumulative Projects	OY No Project	Project Trips	OY With Project
2 Upland Hills Drive/Proj. Driveway 1												
NBL	45	1	0	46	0	46	52	1	0	53	0	53
NBT	36	1	0	37	0	37	73	1	0	74	0	74
NBR	30	1	0	31	13	44	10	0	0	10	43	53
SBL	2	0	0	2	0	2	0	0	0	0	0	0
SBT	47	1	0	48	0	48	39	1	0	40	0	40
SBR	1	0	0	1	0	1	2	0	0	2	0	2
EBL	1	0	0	1	0	1	3	0	0	3	0	3
EBT	1	0	0	1	0	1	0	0	0	0	0	0
EBR	11	0	0	11	0	11	23	0	0	23	0	23
WBL	13	0	0	13	38	51	21	0	0	21	25	46
WBT	3	0	0	3	0	3	2	0	0	2	0	2
WBR	2	0	0	2	0	2	1	0	0	1	0	1
North Leg												
Approach	50	1	0	51	0	51	41	1	0	42	0	42
Departure	39	1	0	40	0	40	77	1	0	78	0	78
Total	89	2	0	91	0	91	118	2	0	120	0	120
South Leg												
Approach	111	3	0	114	13	127	135	2	0	137	43	180
Departure	71	1	0	72	38	110	83	1	0	84	25	109
Total	182	4	0	186	51	237	218	3	0	221	68	289
East Leg												
Approach	18	0	0	18	38	56	24	0	0	24	25	49
Departure	33	1	0	34	13	47	10	0	0	10	43	53
Total	51	1	0	52	51	103	34	0	0	34	68	102
West Leg												
Approach	13	0	0	13	0	13	26	0	0	26	0	26
Departure	49	1	0	50	0	50	56	1	0	57	0	57
Total	62	1	0	63	0	63	82	1	0	83	0	83
Total Approaches												
Approach	192	4	0	196	51	247	226	3	0	229	68	297
Departure	192	4	0	196	51	247	226	3	0	229	68	297
Total	384	8	0	392	102	494	452	6	0	458	136	594

Table C-9 - Opening Year With Project (Access Alternative 2) Peak Hour PCE Volume Summary

	AM Peak Hour						PM Peak Hour					
	Existing PCE Volume	Ambient Growth	Cumulative Projects	OY No Project	Project Trips	OY With Project	Existing PCE Volume	Ambient Growth	Cumulative Projects	OY No Project	Project Trips	OY With Project
3 Upland Hills Drive/16th Street												
NBL	23	0	0	23	0	23	9	0	0	9	0	9
NBT	3	0	0	3	0	3	2	0	0	2	0	2
NBR	4	0	0	4	0	4	5	0	0	5	0	5
SBL	25	1	0	26	8	34	43	1	0	44	5	49
SBT	1	0	0	1	0	1	1	0	0	1	0	1
SBR	34	1	0	35	30	65	44	1	0	45	20	65
EBL	78	2	0	80	10	90	89	2	0	91	34	125
EBT	413	8	10	431	0	431	1,193	24	15	1,232	0	1,232
EBR	10	0	0	10	0	10	29	1	0	30	0	30
WBL	2	0	0	2	0	2	9	0	0	9	0	9
WBT	773	15	10	798	0	798	458	9	15	482	0	482
WBR	26	1	0	27	3	30	40	1	0	41	9	50
North Leg												
Approach	60	2	0	62	38	100	88	2	0	90	25	115
Departure	107	3	0	110	13	123	131	3	0	134	43	177
Total	167	5	0	172	51	223	219	5	0	224	68	292
South Leg												
Approach	30	0	0	30	0	30	16	0	0	16	0	16
Departure	13	0	0	13	0	13	39	1	0	40	0	40
Total	43	0	0	43	0	43	55	1	0	56	0	56
East Leg												
Approach	801	16	10	827	3	830	507	10	15	532	9	541
Departure	442	9	10	461	8	469	1,241	25	15	1,281	5	1,286
Total	1,243	25	20	1,288	11	1,299	1,748	35	30	1,813	14	1,827
West Leg												
Approach	501	10	10	521	10	531	1,311	27	15	1,353	34	1,387
Departure	830	16	10	856	30	886	511	10	15	536	20	556
Total	1,331	26	20	1,377	40	1,417	1,822	37	30	1,889	54	1,943
Total Approaches												
Approach	1,392	28	20	1,440	51	1,491	1,922	39	30	1,991	68	2,059
Departure	1,392	28	20	1,440	51	1,491	1,922	39	30	1,991	68	2,059
Total	2,784	56	40	2,880	102	2,982	3,844	78	60	3,982	136	4,118

Table C-9 - Opening Year With Project (Access Alternative 2) Peak Hour PCE Volume Summary

	AM Peak Hour						PM Peak Hour					
	Existing PCE Volume	Ambient Growth	Cumulative Projects	OY No Project	Project Trips	OY With Project	Existing PCE Volume	Ambient Growth	Cumulative Projects	OY No Project	Project Trips	OY With Project
4 Proj. Driveway 2/16th Street												
NBL	0	0	0	0	0	0	0	0	0	0	0	0
NBT	0	0	0	0	0	0	0	0	0	0	0	0
NBR	0	0	0	0	0	0	0	0	0	0	0	0
SBL	0	0	0	0	0	0	0	0	0	0	0	0
SBT	0	0	0	0	0	0	0	0	0	0	0	0
SBR	0	0	0	0	0	0	0	0	0	0	0	0
EBL	0	0	0	0	0	0	0	0	0	0	0	0
EBT	442	9	10	461	8	469	1,241	25	15	1,281	5	1,286
EBR	0	0	0	0	0	0	0	0	0	0	0	0
WBL	0	0	0	0	0	0	0	0	0	0	0	0
WBT	801	16	10	827	3	830	507	10	15	532	9	541
WBR	0	0	0	0	0	0	0	0	0	0	0	0
North Leg												
Approach	0	0	0	0	0	0	0	0	0	0	0	0
Departure	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
South Leg												
Approach	0	0	0	0	0	0	0	0	0	0	0	0
Departure	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
East Leg												
Approach	801	16	10	827	3	830	507	10	15	532	9	541
Departure	442	9	10	461	8	469	1,241	25	15	1,281	5	1,286
Total	1,243	25	20	1,288	11	1,299	1,748	35	30	1,813	14	1,827
West Leg												
Approach	442	9	10	461	8	469	1,241	25	15	1,281	5	1,286
Departure	801	16	10	827	3	830	507	10	15	532	9	541
Total	1,243	25	20	1,288	11	1,299	1,748	35	30	1,813	14	1,827
Total Approaches												
Approach	1,243	25	20	1,288	11	1,299	1,748	35	30	1,813	14	1,827
Departure	1,243	25	20	1,288	11	1,299	1,748	35	30	1,813	14	1,827
Total	2,486	50	40	2,576	22	2,598	3,496	70	60	3,626	28	3,654

APPENDIX D:

LEVELS OF SERVICE WORKSHEETS

HCM 2010 Signalized Intersection Summary

1: Madison Street & Magnolia Ave

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	146	808	135	135	466	53	119	419	143	47	444	172
Future Volume (veh/h)	146	808	135	135	466	53	119	419	143	47	444	172
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	178	985	165	165	568	65	145	511	174	57	541	210
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	226	1022	171	204	1037	118	181	699	237	170	656	254
Arrive On Green	0.13	0.33	0.33	0.11	0.32	0.32	0.20	0.53	0.53	0.09	0.26	0.26
Sat Flow, veh/h	1810	3096	518	1810	3266	373	1810	2649	898	1810	2546	985
Grp Volume(v), veh/h	178	574	576	165	313	320	145	347	338	57	383	368
Grp Sat Flow(s),veh/h/ln	1810	1805	1809	1810	1805	1834	1810	1805	1742	1810	1805	1726
Q Serve(g_s), s	7.6	25.0	25.0	7.1	11.5	11.5	6.1	11.8	12.0	2.4	16.0	16.1
Cycle Q Clear(g_c), s	7.6	25.0	25.0	7.1	11.5	11.5	6.1	11.8	12.0	2.4	16.0	16.1
Prop In Lane	1.00		0.29	1.00		0.20	1.00		0.52	1.00		0.57
Lane Grp Cap(c), veh/h	226	596	597	204	573	582	181	476	459	170	465	444
V/C Ratio(X)	0.79	0.96	0.97	0.81	0.55	0.55	0.80	0.73	0.74	0.34	0.82	0.83
Avail Cap(c_a), veh/h	258	596	597	204	573	582	181	476	459	170	465	444
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.0	26.3	26.3	34.7	22.6	22.6	31.2	16.7	16.7	33.9	28.0	28.0
Incr Delay (d2), s/veh	13.2	27.9	28.2	21.3	1.1	1.1	21.7	9.3	9.8	1.2	15.2	16.1
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	4.6	17.1	17.2	4.8	5.8	6.0	4.1	7.0	6.9	1.2	9.9	9.7
LnGrp Delay(d),s/veh	47.2	54.2	54.6	55.9	23.6	23.7	53.0	26.0	26.6	35.1	43.2	44.2
LnGrp LOS	D	D	D	E	C	C	D	C	C	D	D	D
Approach Vol, veh/h	1328				798				830			
Approach Delay, s/veh	53.4				30.3				30.9			
Approach LOS	D				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	11.5	25.1	13.0	30.4	12.0	24.6	14.0	29.4				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	7.0	20.6	8.5	25.9	7.5	20.1	10.9	23.5				
Max Q Clear Time (g_c+I1), s	4.4	14.0	9.1	27.0	8.1	18.1	9.6	13.5				
Green Ext Time (p_c), s	1.3	2.4	0.0	0.0	0.0	1.0	0.1	7.2				
Intersection Summary												
HCM 2010 Ctrl Delay	41.3											
HCM 2010 LOS	D											

HCM 2010 Signalized Intersection Summary

2: Madison Street & Elementary School Exit

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	119	0	81	0	564	0	0	706	0
Future Volume (veh/h)	0	0	0	119	0	81	0	564	0	0	706	0
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	1900	1900	1900	1900	0	1900	0	1900	0	0	1900	1900
Adj Flow Rate, veh/h	0	0	0	140	0	95	0	664	0	0	831	0
Adj No. of Lanes	0	1	0	1	0	1	0	2	0	0	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	2	0	189	0	0	0	2873	0	0	2873	0
Arrive On Green	0.00	0.00	0.00	0.10	0.00	0.01	0.00	1.00	0.00	0.00	1.00	0.00
Sat Flow, veh/h	0-76000		0	1810	140		0	3800	0	0	3800	0
Grp Volume(v), veh/h	0	0	0	140	40.5		0	664	0	0	831	0
Grp Sat Flow(s),veh/h/ln	0	1900	0	1810	D		0	1805	0	0	1805	0
Q Serve(g_s), s	0.0	0.0	0.0	6.0			0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	6.0			0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		0.00	1.00			0.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	2	0	189			0	2873	0	0	2873	0
V/C Ratio(X)	0.00	0.00	0.00	0.74			0.00	0.23	0.00	0.00	0.29	0.00
Avail Cap(c_a), veh/h	0	439	0	362			0	2873	0	0	2873	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	2.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	0.00	0.00	0.00	1.00			0.00	1.00	0.00	0.00	0.50	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	34.8			0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	5.7			0.0	0.2	0.0	0.0	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	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	3.3			0.0	0.1	0.0	0.0	0.1	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	40.5			0.0	0.2	0.0	0.0	0.1	0.0
LnGrp LOS				D				A			A	
Approach Vol, veh/h		0						664			831	
Approach Delay, s/veh		0.0						0.2			0.1	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6						
Phs Duration (G+Y+Rc), s		67.7	12.3	0.0		67.7						
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5						
Max Green Setting (Gmax), s		33.0	15.5	18.0		33.0						
Max Q Clear Time (g_c+l1), s		2.0	8.0	0.0		2.0						
Green Ext Time (p_c), s		13.3	0.2	0.0		13.3						
Intersection Summary												
HCM 2010 Ctrl Delay			3.6									
HCM 2010 LOS			A									

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↑↑			↑↑	
Traffic Vol, veh/h	11	23	112	0	0	0	59	553	89	122	627	76
Future Vol, veh/h	11	23	112	0	0	0	59	553	89	122	627	76
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	6	27	132	0	0	0	69	651	105	144	738	89
Major/Minor	Minor2			Major1			Major2					
Conflicting Flow All	1533	1963	414				827	0	0	755	0	0
Stage 1	1069	1069	-				-	-	-	-	-	-
Stage 2	464	894	-				-	-	-	-	-	-
Critical Hdwy	6.8	6.5	6.9				4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.8	5.5	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.8	5.5	-				-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3				2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	109	64	593				813	-	-	865	-	-
Stage 1	296	300	-				-	-	-	-	-	-
Stage 2	605	362	-				-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	64	0	593				813	-	-	865	-	-
Mov Cap-2 Maneuver	64	0	-				-	-	-	-	-	-
Stage 1	203	0	-				-	-	-	-	-	-
Stage 2	515	0	-				-	-	-	-	-	-
Approach	EB			NB			SB					
HCM Control Delay, s	18.6			0.8			1.5					
HCM LOS	C											
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR					
Capacity (veh/h)	813	-	-	428	865	-	-					
HCM Lane V/C Ratio	0.085	-	-	0.386	0.166	-	-					
HCM Control Delay (s)	9.8	-	-	18.6	10	-	-					
HCM Lane LOS	A	-	-	C	A	-	-					
HCM 95th %tile Q(veh)	0.3	-	-	1.8	0.6	-	-					

HCM 2010 Signalized Intersection Summary

4: Madison Street & Proj DWY 1/Garden Street

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	1	7	66	0	61	15	611	43	43	697	18
Future Volume (veh/h)	12	1	7	66	0	61	15	611	43	43	697	18
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	13	1	8	74	0	69	17	687	48	48	783	20
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	171	27	72	158	11	93	61	1498	105	519	2483	63
Arrive On Green	0.13	0.13	0.13	0.13	0.00	0.13	0.07	0.88	0.88	0.57	1.00	1.00
Sat Flow, veh/h	789	215	574	709	86	741	1810	3424	239	1810	3597	92
Grp Volume(v), veh/h	22	0	0	143	0	0	17	362	373	48	393	410
Grp Sat Flow(s),veh/h/ln	1578	0	0	1535	0	0	1810	1805	1858	1810	1805	1884
Q Serve(g_s), s	0.0	0.0	0.0	6.2	0.0	0.0	0.7	3.3	3.4	1.0	0.0	0.0
Cycle Q Clear(g_c), s	0.9	0.0	0.0	7.1	0.0	0.0	0.7	3.3	3.4	1.0	0.0	0.0
Prop In Lane	0.59		0.36	0.52		0.48	1.00		0.13	1.00		0.05
Lane Grp Cap(c), veh/h	270	0	0	262	0	0	61	790	813	519	1246	1300
V/C Ratio(X)	0.08	0.00	0.00	0.55	0.00	0.00	0.28	0.46	0.46	0.09	0.32	0.32
Avail Cap(c_a), veh/h	506	0	0	506	0	0	204	790	813	519	1246	1300
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.9	0.0	0.0	33.6	0.0	0.0	36.4	3.0	3.0	12.4	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	1.8	0.0	0.0	2.4	1.9	1.9	0.1	0.7	0.6
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	0.4	0.0	0.0	3.2	0.0	0.0	0.4	1.8	1.9	0.5	0.2	0.2
LnGrp Delay(d),s/veh	31.1	0.0	0.0	35.4	0.0	0.0	38.8	4.9	4.9	12.5	0.7	0.6
LnGrp LOS	C			D			D	A	A	B	A	A
Approach Vol, veh/h		22			143			752			851	
Approach Delay, s/veh		31.1			35.4			5.7			1.3	
Approach LOS		C			D			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	26.9	39.0		14.1	6.7	59.2		14.1				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	9.5	34.5		22.5	8.5	35.5		22.5				
Max Q Clear Time (g_c+I1), s	3.0	5.4		2.9	2.7	2.0		9.1				
Green Ext Time (p_c), s	1.5	5.1		0.8	0.0	5.9		0.7				
Intersection Summary												
HCM 2010 Ctrl Delay			6.3									
HCM 2010 LOS			A									

HCM 2010 TWSC
5: Madison Street & Proj DWY 2

7/6/2016

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	0	19	6	0	4	40	663	21	8	749	13
Future Vol, veh/h	2	0	19	6	0	4	40	663	21	8	749	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	60	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	0	21	7	0	4	44	737	23	9	832	14
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1314	1706	423	1271	1701	380	847	0	0	760	0	0
Stage 1	857	857	-	837	837	-	-	-	-	-	-	-
Stage 2	457	849	-	434	864	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	118	92	585	127	93	624	799	-	-	861	-	-
Stage 1	323	377	-	332	385	-	-	-	-	-	-	-
Stage 2	558	380	-	576	374	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	111	86	585	116	87	624	799	-	-	861	-	-
Mov Cap-2 Maneuver	111	86	-	116	87	-	-	-	-	-	-	-
Stage 1	305	373	-	314	364	-	-	-	-	-	-	-
Stage 2	524	359	-	549	370	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	14.2			27.4			0.5			0.1		
HCM LOS	B			D								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	799	-	-	416	172	861	-	-				
HCM Lane V/C Ratio	0.056	-	-	0.056	0.065	0.01	-	-				
HCM Control Delay (s)	9.8	-	-	14.2	27.4	9.2	-	-				
HCM Lane LOS	A	-	-	B	D	A	-	-				
HCM 95th %tile Q(veh)	0.2	-	-	0.2	0.2	0	-	-				

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	32	0	724	773	1
Future Vol, veh/h	0	32	0	724	773	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	35	0	796	849	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	425	851	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	5.3	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	3.1	-	-	-
Pot Cap-1 Maneuver	0	498	468	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	498	468	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.8	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	468	-	498	-	-	
HCM Lane V/C Ratio	-	-	0.071	-	-	
HCM Control Delay (s)	0	-	12.8	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.2	-	-	

HCM 2010 Signalized Intersection Summary

7: Madison Street & SR_91 WB

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰	↱	↰	↱			↱	↰
Traffic Volume (veh/h)	0	0	0	311	4	224	297	500	0	0	522	283
Future Volume (veh/h)	0	0	0	311	4	224	297	500	0	0	522	283
Number				3	8	18	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	1900	1900	1900	1900	0	0	1900	1900
Adj Flow Rate, veh/h				334	4	241	319	538	0	0	561	304
Adj No. of Lanes				0	1	1	1	2	0	0	3	1
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				415	5	374	675	2412	0	0	1271	396
Arrive On Green				0.23	0.23	0.23	0.75	1.00	0.00	0.00	0.08	0.08
Sat Flow, veh/h				1789	21	1615	1810	3705	0	0	5358	1615
Grp Volume(v), veh/h				338	0	241	319	538	0	0	561	304
Grp Sat Flow(s),veh/h/ln				1811	0	1615	1810	1805	0	0	1729	1615
Q Serve(g_s), s				14.1	0.0	10.8	5.5	0.0	0.0	0.0	8.2	14.8
Cycle Q Clear(g_c), s				14.1	0.0	10.8	5.5	0.0	0.0	0.0	8.2	14.8
Prop In Lane				0.99		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				420	0	374	675	2412	0	0	1271	396
V/C Ratio(X)				0.81	0.00	0.64	0.47	0.22	0.00	0.00	0.44	0.77
Avail Cap(c_a), veh/h				566	0	505	675	2412	0	0	1271	396
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	0.33	0.33
Upstream Filter(I)				1.00	0.00	1.00	0.96	0.96	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				29.0	0.0	27.7	7.1	0.0	0.0	0.0	31.5	34.5
Incr Delay (d2), s/veh				6.1	0.0	1.9	0.5	0.2	0.0	0.0	1.1	13.4
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				7.8	0.0	5.0	2.7	0.1	0.0	0.0	4.1	8.1
LnGrp Delay(d),s/veh				35.1	0.0	29.6	7.6	0.2	0.0	0.0	32.7	47.9
LnGrp LOS				D		C	A	A			C	D
Approach Vol, veh/h					579			857			865	
Approach Delay, s/veh					32.8			2.9			38.0	
Approach LOS					C			A			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		57.4			33.8	23.6		22.6				
Change Period (Y+Rc), s		4.5			4.5	4.5		4.5				
Max Green Setting (Gmax), s		46.5			22.9	19.1		24.5				
Max Q Clear Time (g_c+I1), s		2.0			7.5	16.8		16.1				
Green Ext Time (p_c), s		5.2			4.2	1.2		1.9				
Intersection Summary												
HCM 2010 Ctrl Delay				23.6								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary

8: Madison Street & SR_91 EB

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	86	22	77	0	0	0	0	711	369	240	593	0
Future Volume (veh/h)	86	22	77	0	0	0	0	711	369	240	593	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	1900	1900				0	1900	1900	1900	1900	0
Adj Flow Rate, veh/h	91	23	82				0	756	393	255	631	0
Adj No. of Lanes	1	0	1				0	3	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	168	0	150				0	3060	953	303	2915	0
Arrive On Green	0.09	0.09	0.09				0.00	0.19	0.19	0.33	1.00	0.00
Sat Flow, veh/h	1810	0	1615				0	5358	1615	1810	3705	0
Grp Volume(v), veh/h	91	0	82				0	756	393	255	631	0
Grp Sat Flow(s),veh/h/ln	1810	0	1615				0	1729	1615	1810	1805	0
Q Serve(g_s), s	3.8	0.0	3.9				0.0	9.9	17.0	10.4	0.0	0.0
Cycle Q Clear(g_c), s	3.8	0.0	3.9				0.0	9.9	17.0	10.4	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	168	0	150				0	3060	953	303	2915	0
V/C Ratio(X)	0.54	0.00	0.55				0.00	0.25	0.41	0.84	0.22	0.00
Avail Cap(c_a), veh/h	430	0	384				0	3060	953	498	2915	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	0.33	0.33	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.73	0.73	0.94	0.94	0.00
Uniform Delay (d), s/veh	34.7	0.0	34.7				0.0	17.2	20.1	25.6	0.0	0.0
Incr Delay (d2), s/veh	2.7	0.0	3.1				0.0	0.1	1.0	6.4	0.2	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	2.0	0.0	1.9				0.0	4.8	7.9	5.6	0.1	0.0
LnGrp Delay(d),s/veh	37.4	0.0	37.8				0.0	17.3	21.0	32.1	0.2	0.0
LnGrp LOS	D		D					B	C	C	A	
Approach Vol, veh/h		173						1149			886	
Approach Delay, s/veh		37.6						18.6			9.3	
Approach LOS		D						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	17.4	51.2		11.4		68.6						
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5						
Max Green Setting (Gmax), s	21.5	26.5		18.5		52.5						
Max Q Clear Time (g_c+1/4), s	12.4	19.0		5.9		2.0						
Green Ext Time (p_c), s	0.5	5.5		0.4		17.0						
Intersection Summary												
HCM 2010 Ctrl Delay			16.4									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary

9: Madison Street & Indiana Ave

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	211	767	36	21	156	299	35	571	38	216	289	165
Future Volume (veh/h)	211	767	36	21	156	299	35	571	38	216	289	165
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	229	834	39	23	170	325	38	621	41	235	314	179
Adj No. of Lanes	1	2	0	1	2	0	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, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	279	1195	56	75	411	368	191	908	60	279	699	390
Arrive On Green	0.15	0.34	0.34	0.04	0.23	0.23	0.11	0.26	0.26	0.26	0.52	0.52
Sat Flow, veh/h	1810	3512	164	1810	1805	1615	1810	3438	227	1810	2238	1247
Grp Volume(v), veh/h	229	429	444	23	170	325	38	326	336	235	252	241
Grp Sat Flow(s),veh/h/ln	1810	1805	1871	1810	1805	1615	1810	1805	1860	1810	1805	1680
Q Serve(g_s), s	9.8	16.4	16.4	1.0	6.4	15.6	1.5	13.0	13.0	9.9	7.0	7.2
Cycle Q Clear(g_c), s	9.8	16.4	16.4	1.0	6.4	15.6	1.5	13.0	13.0	9.9	7.0	7.2
Prop In Lane	1.00		0.09	1.00		1.00	1.00		0.12	1.00		0.74
Lane Grp Cap(c), veh/h	279	614	637	75	411	368	191	477	491	279	564	525
V/C Ratio(X)	0.82	0.70	0.70	0.31	0.41	0.88	0.20	0.68	0.68	0.84	0.45	0.46
Avail Cap(c_a), veh/h	294	614	637	170	417	373	191	477	491	294	564	525
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98
Uniform Delay (d), s/veh	32.8	22.8	22.8	37.2	26.3	29.9	32.7	26.4	26.4	28.8	14.8	14.9
Incr Delay (d2), s/veh	16.2	3.5	3.3	2.3	0.7	21.1	0.5	7.7	7.5	18.4	2.5	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	8.7	9.0	0.5	3.3	9.1	0.8	7.4	7.7	6.3	3.8	3.6
LnGrp Delay(d),s/veh	49.0	26.3	26.2	39.5	27.0	51.0	33.2	34.1	34.0	47.2	17.3	17.7
LnGrp LOS	D	C	C	D	C	D	C	C	C	D	B	B
Approach Vol, veh/h	1102			518			700			728		
Approach Delay, s/veh	31.0			42.6			34.0			27.1		
Approach LOS	C			D			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	16.3	25.1	7.3	31.2	12.5	29.0	16.3	22.2				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	12.5	19.0	7.0	23.5	7.0	24.5	12.5	18.0				
Max Q Clear Time (g_c+1), s	11.9	15.0	3.0	18.4	3.5	9.2	11.8	17.6				
Green Ext Time (p_c), s	0.0	1.6	0.0	2.7	1.4	2.7	0.1	0.1				
Intersection Summary												
HCM 2010 Ctrl Delay	32.7											
HCM 2010 LOS	C											

HCM 2010 TWSC
10: Madison Street & Evans Street

7/6/2016

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	36	9	25	2	9	58	13	558	8	21	258	24
Future Vol, veh/h	36	9	25	2	9	58	13	558	8	21	258	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	80	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	39	10	27	2	10	63	14	607	9	23	280	26
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1015	982	293	997	991	611	307	0	0	615	0	0
Stage 1	339	339	-	639	639	-	-	-	-	-	-	-
Stage 2	676	643	-	358	352	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	219	251	751	225	248	497	1265	-	-	974	-	-
Stage 1	680	643	-	468	474	-	-	-	-	-	-	-
Stage 2	446	472	-	664	635	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	180	242	751	205	239	497	1265	-	-	974	-	-
Mov Cap-2 Maneuver	180	242	-	205	239	-	-	-	-	-	-	-
Stage 1	672	628	-	463	469	-	-	-	-	-	-	-
Stage 2	377	467	-	615	620	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	24.6			15.4			0.2			0.6		
HCM LOS	C			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1265	-	-	259	420	974	-	-				
HCM Lane V/C Ratio	0.011	-	-	0.294	0.179	0.023	-	-				
HCM Control Delay (s)	7.9	-	-	24.6	15.4	8.8	-	-				
HCM Lane LOS	A	-	-	C	C	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	1.2	0.6	0.1	-	-				

HCM 2010 Signalized Intersection Summary

1: Madison Street & Magnolia Ave

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	92	688	163	248	632	38	95	350	112	37	451	86
Future Volume (veh/h)	92	688	163	248	632	38	95	350	112	37	451	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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	98	732	173	264	672	40	101	372	119	39	480	91
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	152	797	188	312	1259	75	176	692	219	174	773	146
Arrive On Green	0.08	0.28	0.28	0.17	0.36	0.36	0.03	0.08	0.08	0.10	0.25	0.25
Sat Flow, veh/h	1810	2899	685	1810	3463	206	1810	2702	853	1810	3032	572
Grp Volume(v), veh/h	98	456	449	264	350	362	101	247	244	39	285	286
Grp Sat Flow(s),veh/h/ln	1810	1805	1779	1810	1805	1864	1810	1805	1749	1810	1805	1799
Q Serve(g_s), s	4.2	19.6	19.6	11.3	12.2	12.3	4.4	10.5	10.7	1.6	11.2	11.3
Cycle Q Clear(g_c), s	4.2	19.6	19.6	11.3	12.2	12.3	4.4	10.5	10.7	1.6	11.2	11.3
Prop In Lane	1.00		0.39	1.00		0.11	1.00		0.49	1.00		0.32
Lane Grp Cap(c), veh/h	152	496	489	312	656	678	176	463	448	174	460	459
V/C Ratio(X)	0.65	0.92	0.92	0.85	0.53	0.53	0.57	0.53	0.54	0.22	0.62	0.62
Avail Cap(c_a), veh/h	222	496	489	317	656	678	176	463	448	174	460	459
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	28.1	28.1	32.1	20.1	20.1	37.1	32.0	32.1	33.4	26.4	26.4
Incr Delay (d2), s/veh	4.5	22.1	22.4	18.5	0.8	0.8	4.3	4.3	4.6	0.6	6.1	6.3
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	2.3	12.8	12.7	7.2	6.3	6.5	2.4	5.8	5.8	0.8	6.3	6.4
LnGrp Delay(d),s/veh	40.0	50.3	50.5	50.5	20.9	20.9	41.4	36.3	36.7	34.0	32.5	32.7
LnGrp LOS	D	D	D	D	C	C	D	D	D	C	C	C
Approach Vol, veh/h	1003				976				592			
Approach Delay, s/veh	49.4				28.9				37.4			
Approach LOS	D				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	11.7	24.5	17.8	26.0	11.8	24.4	10.7	33.1				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	7.0	20.0	13.5	21.5	7.1	19.9	9.3	25.7				
Max Q Clear Time (g_c+I1), s	3.6	12.7	13.3	21.6	6.4	13.3	6.2	14.3				
Green Ext Time (p_c), s	0.1	1.7	0.0	0.0	0.0	1.9	0.1	4.1				
Intersection Summary												
HCM 2010 Ctrl Delay	37.7											
HCM 2010 LOS	D											

HCM 2010 Signalized Intersection Summary

2: Madison Street & Elementary School Exit

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	1	31	1	25	1	560	0	0	790	0
Future Volume (veh/h)	0	0	1	31	1	25	1	560	0	0	790	0
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	1900	1900	1900	1900	1900	1900	1900	1900	0	0	1900	1900
Adj Flow Rate, veh/h	0	0	1	36	1	29	1	659	0	0	929	0
Adj No. of Lanes	0	1	0	1	0	1	0	2	0	0	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	0	80	98	0	249	46	2641	0	0	2692	0
Arrive On Green	0.00	0.00	0.05	0.05	0.15	0.15	1.00	1.00	0.00	0.00	1.00	0.00
Sat Flow, veh/h	0	0	1615	1810	0	1615	1	3627	0	0	3800	0
Grp Volume(v), veh/h	0	0	1	36	0	29	354	306	0	0	929	0
Grp Sat Flow(s),veh/h/ln	0	0	1615	1810	0	1615	1899	1643	0	0	1805	0
Q Serve(g_s), s	0.0	0.0	0.0	1.5	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	1.5	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		1.00	1.00		1.00	0.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	0	80	98	0	249	1461	1225	0	0	2692	0
V/C Ratio(X)	0.00	0.00	0.01	0.37	0.00	0.12	0.24	0.25	0.00	0.00	0.35	0.00
Avail Cap(c_a), veh/h	0	0	373	204	0	636	1461	1225	0	0	2692	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	0.71	0.00
Uniform Delay (d), s/veh	0.0	0.0	36.1	36.5	0.0	29.1	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.1	2.3	0.0	0.2	0.4	0.5	0.0	0.0	0.3	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	0.0	0.0	0.0	0.8	0.0	0.6	0.2	0.2	0.0	0.0	0.1	0.0
LnGrp Delay(d),s/veh	0.0	0.0	36.2	38.7	0.0	29.3	0.4	0.5	0.0	0.0	0.3	0.0
LnGrp LOS			D	D		C	A	A			A	
Approach Vol, veh/h		1			65			660			929	
Approach Delay, s/veh		36.2			34.5			0.4			0.3	
Approach LOS		D			C			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6		8				
Phs Duration (G+Y+Rc), s		63.7	8.4	8.0		63.7		16.3				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5		4.5				
Max Green Setting (Gmax), s		40.0	8.5	18.0		40.0		31.0				
Max Q Clear Time (g_c+I1), s		2.0	3.5	2.0		2.0		3.2				
Green Ext Time (p_c), s		14.9	0.0	0.0		14.9		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay				1.7								
HCM 2010 LOS				A								

Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕					↕↕				↕↕	
Traffic Vol, veh/h	8	10	56	0	0	0	72	553	15	35	747	39
Future Vol, veh/h	8	10	56	0	0	0	72	553	15	35	747	39
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	4	11	62	0	0	0	80	614	17	39	830	43
Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	1396	1720	437				873	0	0	631	0	0
Stage 1	929	929	-				-	-	-	-	-	-
Stage 2	467	791	-				-	-	-	-	-	-
Critical Hdwy	6.8	6.5	6.9				4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.8	5.5	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.8	5.5	-				-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3				2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	135	90	573				781	-	-	961	-	-
Stage 1	350	349	-				-	-	-	-	-	-
Stage 2	603	404	-				-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	105	0	573				781	-	-	961	-	-
Mov Cap-2 Maneuver	105	0	-				-	-	-	-	-	-
Stage 1	322	0	-				-	-	-	-	-	-
Stage 2	508	0	-				-	-	-	-	-	-
Approach	EB						NB			SB		
HCM Control Delay, s	14.9						1.1			0.4		
HCM LOS	B											
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR					
Capacity (veh/h)	781	-	-	442	961	-	-					
HCM Lane V/C Ratio	0.102	-	-	0.176	0.04	-	-					
HCM Control Delay (s)	10.1	-	-	14.9	8.9	-	-					
HCM Lane LOS	B	-	-	B	A	-	-					
HCM 95th %tile Q(veh)	0.3	-	-	0.6	0.1	-	-					

HCM 2010 Signalized Intersection Summary

4: Madison Street & Proj DWY 1/Garden Street

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	6	7	141	1	63	37	581	47	84	735	20
Future Volume (veh/h)	19	6	7	141	1	63	37	581	47	84	735	20
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	21	7	8	157	1	70	41	646	52	93	817	22
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	223	76	65	268	4	87	406	1354	109	474	1571	42
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.45	0.80	0.80	0.52	0.88	0.88
Sat Flow, veh/h	807	404	346	1021	23	463	1810	3385	272	1810	3591	97
Grp Volume(v), veh/h	36	0	0	228	0	0	41	344	354	93	411	428
Grp Sat Flow(s),veh/h/ln	1557	0	0	1508	0	0	1810	1805	1852	1810	1805	1883
Q Serve(g_s), s	0.0	0.0	0.0	10.2	0.0	0.0	1.0	4.9	4.9	2.2	4.2	4.2
Cycle Q Clear(g_c), s	1.3	0.0	0.0	11.5	0.0	0.0	1.0	4.9	4.9	2.2	4.2	4.2
Prop In Lane	0.58		0.22	0.69		0.31	1.00		0.15	1.00		0.05
Lane Grp Cap(c), veh/h	364	0	0	360	0	0	406	722	741	474	790	824
V/C Ratio(X)	0.10	0.00	0.00	0.63	0.00	0.00	0.10	0.48	0.48	0.20	0.52	0.52
Avail Cap(c_a), veh/h	549	0	0	543	0	0	406	722	741	474	790	824
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.9	0.0	0.0	30.9	0.0	0.0	17.4	5.3	5.3	14.6	3.1	3.1
Incr Delay (d2), s/veh	0.1	0.0	0.0	1.9	0.0	0.0	0.1	2.2	2.2	0.2	2.4	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	5.0	0.0	0.0	0.5	2.7	2.8	1.1	2.4	2.4
LnGrp Delay(d),s/veh	27.0	0.0	0.0	32.7	0.0	0.0	17.5	7.5	7.5	14.8	5.5	5.4
LnGrp LOS	C			C			B	A	A	B	A	A
Approach Vol, veh/h		36			228			739			932	
Approach Delay, s/veh		27.0			32.7			8.1			6.4	
Approach LOS		C			C			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	24.9	36.0		19.1	21.9	39.0		19.1				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	10.5	31.5		24.5	7.5	34.5		24.5				
Max Q Clear Time (g_c+I1), s	4.2	6.9		3.3	3.0	6.2		13.5				
Green Ext Time (p_c), s	0.2	4.6		1.5	0.1	5.9		1.1				
Intersection Summary												
HCM 2010 Ctrl Delay				10.5								
HCM 2010 LOS				B								

HCM 2010 TWSC
5: Madison Street & Proj DWY 2

7/6/2016

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	0	35	17	1	31	26	632	47	23	830	30
Future Vol, veh/h	2	0	35	17	1	31	26	632	47	23	830	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	60	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	0	37	18	1	33	27	665	49	24	874	32
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1326	1707	453	1230	1699	357	905	0	0	715	0	0
Stage 1	938	938	-	745	745	-	-	-	-	-	-	-
Stage 2	388	769	-	485	954	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	116	92	559	136	93	645	760	-	-	895	-	-
Stage 1	288	346	-	377	424	-	-	-	-	-	-	-
Stage 2	613	413	-	537	340	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	104	86	559	121	87	645	760	-	-	895	-	-
Mov Cap-2 Maneuver	104	86	-	121	87	-	-	-	-	-	-	-
Stage 1	278	337	-	364	409	-	-	-	-	-	-	-
Stage 2	560	398	-	488	331	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	13.7			23.6			0.4			0.2		
HCM LOS	B			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	760	-	-	452	245	895	-	-				
HCM Lane V/C Ratio	0.036	-	-	0.086	0.211	0.027	-	-				
HCM Control Delay (s)	9.9	-	-	13.7	23.6	9.1	-	-				
HCM Lane LOS	A	-	-	B	C	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.8	0.1	-	-				

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	26	0	705	876	6
Future Vol, veh/h	0	26	0	705	876	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	29	0	775	963	7
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	485	969	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	5.3	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	3.1	-	-	-
Pot Cap-1 Maneuver	0	456	411	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	456	411	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	13.4	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	411	-	456	-	-	
HCM Lane V/C Ratio	-	-	0.063	-	-	
HCM Control Delay (s)	0	-	13.4	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.2	-	-	

HCM 2010 Signalized Intersection Summary 7: Madison Street & SR_91 WB

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰	↱	↰	↱			↱	↰
Traffic Volume (veh/h)	0	0	0	208	1	177	260	528	0	0	645	257
Future Volume (veh/h)	0	0	0	208	1	177	260	528	0	0	645	257
Number				3	8	18	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	1900	1900	1900	1900	0	0	1900	1900
Adj Flow Rate, veh/h				210	1	179	263	533	0	0	652	260
Adj No. of Lanes				0	1	1	1	2	0	0	3	1
Peak Hour Factor				0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				285	1	256	731	2677	0	0	1491	464
Arrive On Green				0.16	0.16	0.16	0.81	1.00	0.00	0.00	0.38	0.38
Sat Flow, veh/h				1801	9	1615	1810	3705	0	0	5358	1615
Grp Volume(v), veh/h				211	0	179	263	533	0	0	652	260
Grp Sat Flow(s),veh/h/ln				1810	0	1615	1810	1805	0	0	1729	1615
Q Serve(g_s), s				8.9	0.0	8.4	3.1	0.0	0.0	0.0	7.5	10.1
Cycle Q Clear(g_c), s				8.9	0.0	8.4	3.1	0.0	0.0	0.0	7.5	10.1
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				287	0	256	731	2677	0	0	1491	464
V/C Ratio(X)				0.74	0.00	0.70	0.36	0.20	0.00	0.00	0.44	0.56
Avail Cap(c_a), veh/h				475	0	424	731	2677	0	0	1491	464
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.33	1.33
Upstream Filter(I)				1.00	0.00	1.00	0.97	0.97	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				32.1	0.0	31.9	4.9	0.0	0.0	0.0	19.9	20.7
Incr Delay (d2), s/veh				3.7	0.0	3.5	0.3	0.2	0.0	0.0	0.9	4.8
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				4.7	0.0	4.0	1.5	0.1	0.0	0.0	3.7	5.1
LnGrp Delay(d),s/veh				35.7	0.0	35.3	5.2	0.2	0.0	0.0	20.8	25.5
LnGrp LOS				D		D	A	A			C	C
Approach Vol, veh/h					390			796			912	
Approach Delay, s/veh					35.5			1.8			22.2	
Approach LOS					D			A			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		63.3			36.3	27.0		16.7				
Change Period (Y+Rc), s		4.5			4.5	4.5		4.5				
Max Green Setting (Gmax), s		50.5			23.5	22.5		20.5				
Max Q Clear Time (g_c+I1), s		2.0			5.1	12.1		10.9				
Green Ext Time (p_c), s		5.0			4.2	3.9		1.3				
Intersection Summary												
HCM 2010 Ctrl Delay				16.9								
HCM 2010 LOS				B								

HCM 2010 Signalized Intersection Summary

8: Madison Street & SR_91 EB

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	3	144	0	0	0	0	668	396	197	656	0
Future Volume (veh/h)	120	3	144	0	0	0	0	668	396	197	656	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	1900	1900				0	1900	1900	1900	1900	0
Adj Flow Rate, veh/h	125	3	150				0	696	412	205	683	0
Adj No. of Lanes	1	0	1				0	3	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	231	0	207				0	3020	940	253	2787	0
Arrive On Green	0.13	0.13	0.13				0.00	0.19	0.19	0.28	1.00	0.00
Sat Flow, veh/h	1810	0	1615				0	5358	1615	1810	3705	0
Grp Volume(v), veh/h	125	0	150				0	696	412	205	683	0
Grp Sat Flow(s),veh/h/ln	1810	0	1615				0	1729	1615	1810	1805	0
Q Serve(g_s), s	5.2	0.0	7.1				0.0	9.1	18.0	8.4	0.0	0.0
Cycle Q Clear(g_c), s	5.2	0.0	7.1				0.0	9.1	18.0	8.4	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	231	0	207				0	3020	940	253	2787	0
V/C Ratio(X)	0.54	0.00	0.73				0.00	0.23	0.44	0.81	0.25	0.00
Avail Cap(c_a), veh/h	452	0	404				0	3020	940	452	2787	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	0.33	0.33	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.69	0.69	0.95	0.95	0.00
Uniform Delay (d), s/veh	32.7	0.0	33.5				0.0	17.2	20.8	27.8	0.0	0.0
Incr Delay (d2), s/veh	2.0	0.0	4.8				0.0	0.1	1.0	5.8	0.2	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	2.7	0.0	3.4				0.0	4.4	8.3	4.6	0.1	0.0
LnGrp Delay(d),s/veh	34.6	0.0	38.3				0.0	17.3	21.8	33.6	0.2	0.0
LnGrp LOS	C		D					B	C	C	A	
Approach Vol, veh/h		275						1108			888	
Approach Delay, s/veh		36.7						19.0			7.9	
Approach LOS		D						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	15.2	50.6		14.2		65.8						
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5						
Max Green Setting (Gmax), s	19.5	27.5		19.5		51.5						
Max Q Clear Time (g_c+10), s	10.4	20.0		9.1		2.0						
Green Ext Time (p_c), s	0.4	5.5		0.6		17.0						
Intersection Summary												
HCM 2010 Ctrl Delay			16.8									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary

9: Madison Street & Indiana Ave

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	273	551	85	59	231	317	59	474	40	221	491	88
Future Volume (veh/h)	273	551	85	59	231	317	59	474	40	221	491	88
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	287	580	89	62	243	334	62	499	42	233	517	93
Adj No. of Lanes	1	2	0	1	2	0	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, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	317	1050	161	130	417	373	170	822	69	271	918	164
Arrive On Green	0.17	0.33	0.33	0.07	0.23	0.23	0.09	0.24	0.24	0.20	0.40	0.40
Sat Flow, veh/h	1810	3140	481	1810	1805	1615	1810	3372	283	1810	3060	548
Grp Volume(v), veh/h	287	333	336	62	243	334	62	266	275	233	304	306
Grp Sat Flow(s),veh/h/ln	1810	1805	1815	1810	1805	1615	1810	1805	1850	1810	1805	1803
Q Serve(g_s), s	12.4	12.0	12.1	2.6	9.6	16.0	2.6	10.5	10.5	9.9	10.4	10.5
Cycle Q Clear(g_c), s	12.4	12.0	12.1	2.6	9.6	16.0	2.6	10.5	10.5	9.9	10.4	10.5
Prop In Lane	1.00		0.26	1.00		1.00	1.00		0.15	1.00		0.30
Lane Grp Cap(c), veh/h	317	604	607	130	417	373	170	440	451	271	542	541
V/C Ratio(X)	0.91	0.55	0.55	0.48	0.58	0.89	0.37	0.61	0.61	0.86	0.56	0.57
Avail Cap(c_a), veh/h	317	604	607	170	417	373	170	440	451	271	542	541
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.97	0.97
Uniform Delay (d), s/veh	32.4	21.7	21.7	35.7	27.3	29.8	34.0	26.8	26.9	31.2	20.0	20.0
Incr Delay (d2), s/veh	28.1	1.1	1.1	2.7	2.0	23.0	1.3	6.1	6.0	22.4	4.0	4.1
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	8.7	6.2	6.3	1.4	5.0	9.5	1.4	5.9	6.1	6.6	5.8	5.8
LnGrp Delay(d),s/veh	60.5	22.8	22.8	38.4	29.4	52.8	35.3	32.9	32.9	53.6	24.0	24.1
LnGrp LOS	E	C	C	D	C	D	D	C	C	D	C	C
Approach Vol, veh/h		956			639			603			843	
Approach Delay, s/veh		34.1			42.5			33.1			32.2	
Approach LOS		C			D			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	16.0	23.5	9.7	30.8	11.5	28.0	18.0	22.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	11.5	19.0	7.0	24.5	7.0	23.5	13.5	18.0				
Max Q Clear Time (g_c+1), s	11.5	12.5	4.6	14.1	4.6	12.5	14.4	18.0				
Green Ext Time (p_c), s	0.0	1.9	0.0	5.6	0.9	2.8	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			35.2									
HCM 2010 LOS			D									

HCM 2010 TWSC
10: Madison Street & Evans Street

7/6/2016

Intersection												
Int Delay, s/veh	3.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	38	5	30	4	3	47	26	441	15	66	517	33
Future Vol, veh/h	38	5	30	4	3	47	26	441	15	66	517	33
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	80	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	40	5	31	4	3	49	27	459	16	69	539	34
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1240	1222	556	1232	1231	467	573	0	0	475	0	0
Stage 1	693	693	-	521	521	-	-	-	-	-	-	-
Stage 2	547	529	-	711	710	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	153	181	534	155	179	600	1010	-	-	1098	-	-
Stage 1	437	448	-	542	535	-	-	-	-	-	-	-
Stage 2	525	530	-	427	440	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	129	165	534	133	163	600	1010	-	-	1098	-	-
Mov Cap-2 Maneuver	129	165	-	133	163	-	-	-	-	-	-	-
Stage 1	425	420	-	528	521	-	-	-	-	-	-	-
Stage 2	466	516	-	372	412	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	35.5			14.7			0.5			0.9		
HCM LOS	E			B								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1010	-	-	192	426	1098	-	-				
HCM Lane V/C Ratio	0.027	-	-	0.396	0.132	0.063	-	-				
HCM Control Delay (s)	8.7	-	-	35.5	14.7	8.5	-	-				
HCM Lane LOS	A	-	-	E	B	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	1.8	0.5	0.2	-	-				

HCM 2010 Signalized Intersection Summary

1: Madison Street & Magnolia Ave

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	146	808	142	142	466	53	124	429	148	47	458	172
Future Volume (veh/h)	146	808	142	142	466	53	124	429	148	47	458	172
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	178	985	173	173	568	65	151	523	180	57	559	210
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	226	1013	178	204	1037	118	181	696	239	170	662	248
Arrive On Green	0.13	0.33	0.33	0.11	0.32	0.32	0.20	0.53	0.53	0.09	0.26	0.26
Sat Flow, veh/h	1810	3071	539	1810	3266	373	1810	2641	905	1810	2572	963
Grp Volume(v), veh/h	178	578	580	173	313	320	151	357	346	57	392	377
Grp Sat Flow(s),veh/h/ln	1810	1805	1805	1810	1805	1834	1810	1805	1740	1810	1805	1730
Q Serve(g_s), s	7.6	25.3	25.3	7.5	11.5	11.5	6.4	12.4	12.5	2.4	16.5	16.6
Cycle Q Clear(g_c), s	7.6	25.3	25.3	7.5	11.5	11.5	6.4	12.4	12.5	2.4	16.5	16.6
Prop In Lane	1.00		0.30	1.00		0.20	1.00		0.52	1.00		0.56
Lane Grp Cap(c), veh/h	226	596	596	204	573	582	181	476	459	170	465	445
V/C Ratio(X)	0.79	0.97	0.97	0.85	0.55	0.55	0.83	0.75	0.75	0.34	0.84	0.85
Avail Cap(c_a), veh/h	258	596	596	204	573	582	181	476	459	170	465	445
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.0	26.4	26.4	34.8	22.6	22.6	31.4	16.8	16.9	33.9	28.2	28.2
Incr Delay (d2), s/veh	13.2	29.6	30.0	27.3	1.1	1.1	26.7	10.1	10.7	1.2	16.8	17.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	17.4	17.5	5.3	5.8	6.0	4.5	7.3	7.1	1.2	10.3	10.1
LnGrp Delay(d),s/veh	47.2	56.0	56.5	62.1	23.6	23.7	58.0	27.0	27.6	35.1	45.0	45.9
LnGrp LOS	D	E	E	E	C	C	E	C	C	D	D	D
Approach Vol, veh/h	1336				806				854			
Approach Delay, s/veh	55.0				31.9				32.7			
Approach LOS	E				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	11.5	25.1	13.0	30.4	12.0	24.6	14.0	29.4				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	7.0	20.6	8.5	25.9	7.5	20.1	10.9	23.5				
Max Q Clear Time (g_c+I1), s	4.4	14.5	9.5	27.3	8.4	18.6	9.6	13.5				
Green Ext Time (p_c), s	1.3	2.3	0.0	0.0	0.0	0.8	0.1	7.2				
Intersection Summary												
HCM 2010 Ctrl Delay	42.9											
HCM 2010 LOS	D											

HCM 2010 Signalized Intersection Summary

2: Madison Street & Elementary School Exit

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	119	0	81	0	589	0	0	740	0
Future Volume (veh/h)	0	0	0	119	0	81	0	589	0	0	740	0
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	1900	1900	1900	1900	0	1900	0	1900	0	0	1900	1900
Adj Flow Rate, veh/h	0	0	0	140	0	95	0	693	0	0	871	0
Adj No. of Lanes	0	1	0	1	0	1	0	2	0	0	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	2	0	189	0	0	0	2873	0	0	2873	0
Arrive On Green	0.00	0.00	0.00	0.10	0.00	0.01	0.00	1.00	0.00	0.00	1.00	0.00
Sat Flow, veh/h	0-76000		0	1810	140		0	3800	0	0	3800	0
Grp Volume(v), veh/h	0	0	0	140	40.5		0	693	0	0	871	0
Grp Sat Flow(s),veh/h/ln	0	1900	0	1810	D		0	1805	0	0	1805	0
Q Serve(g_s), s	0.0	0.0	0.0	6.0			0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	6.0			0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		0.00	1.00			0.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	2	0	189			0	2873	0	0	2873	0
V/C Ratio(X)	0.00	0.00	0.00	0.74			0.00	0.24	0.00	0.00	0.30	0.00
Avail Cap(c_a), veh/h	0	439	0	362			0	2873	0	0	2873	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	2.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	0.00	0.00	0.00	1.00			0.00	1.00	0.00	0.00	0.46	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	34.8			0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	5.7			0.0	0.2	0.0	0.0	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	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	3.3			0.0	0.1	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	40.5			0.0	0.2	0.0	0.0	0.1	0.0
LnGrp LOS				D				A			A	
Approach Vol, veh/h		0						693			871	
Approach Delay, s/veh		0.0						0.2			0.1	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6						
Phs Duration (G+Y+Rc), s		67.7	12.3	0.0		67.7						
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5						
Max Green Setting (Gmax), s		33.0	15.5	18.0		33.0						
Max Q Clear Time (g_c+l1), s		2.0	8.0	0.0		2.0						
Green Ext Time (p_c), s		14.1	0.2	0.0		14.1						
Intersection Summary												
HCM 2010 Ctrl Delay			3.5									
HCM 2010 LOS			A									

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↑↑			↑↑	
Traffic Vol, veh/h	11	23	119	0	0	0	64	578	89	122	661	76
Future Vol, veh/h	11	23	119	0	0	0	64	578	89	122	661	76
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	6	27	140	0	0	0	75	680	105	144	778	89
Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	1600	2044	434				867	0	0	785	0	0
Stage 1	1109	1109	-				-	-	-	-	-	-
Stage 2	491	935	-				-	-	-	-	-	-
Critical Hdwy	6.8	6.5	6.9				4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.8	5.5	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.8	5.5	-				-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3				2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	99	57	576				785	-	-	843	-	-
Stage 1	282	288	-				-	-	-	-	-	-
Stage 2	586	347	-				-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	54	0	576				785	-	-	843	-	-
Mov Cap-2 Maneuver	54	0	-				-	-	-	-	-	-
Stage 1	187	0	-				-	-	-	-	-	-
Stage 2	485	0	-				-	-	-	-	-	-
Approach	EB						NB			SB		
HCM Control Delay, s	20.5						0.9			1.4		
HCM LOS	C											
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR					
Capacity (veh/h)	785	-	-	404	843	-	-					
HCM Lane V/C Ratio	0.096	-	-	0.43	0.17	-	-					
HCM Control Delay (s)	10.1	-	-	20.5	10.1	-	-					
HCM Lane LOS	B	-	-	C	B	-	-					
HCM 95th %tile Q(veh)	0.3	-	-	2.1	0.6	-	-					

HCM 2010 Signalized Intersection Summary

4: Madison Street & Proj DWY 1/Garden Street

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	1	60	65	2	60	84	619	43	43	712	45
Future Volume (veh/h)	35	1	60	65	2	60	84	619	43	43	712	45
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	39	1	67	73	2	67	94	696	48	48	800	51
Adj No. of Lanes	0	1	1	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	266	6	230	155	19	94	150	1499	103	488	2152	137
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.11	0.58	0.58	0.54	1.00	1.00
Sat Flow, veh/h	1238	40	1615	607	130	659	1810	3427	236	1810	3447	220
Grp Volume(v), veh/h	40	0	67	142	0	0	94	366	378	48	419	432
Grp Sat Flow(s),veh/h/ln	1279	0	1615	1396	0	0	1810	1805	1858	1810	1805	1861
Q Serve(g_s), s	0.0	0.0	3.0	5.7	0.0	0.0	4.0	9.3	9.3	1.0	0.0	0.0
Cycle Q Clear(g_c), s	2.3	0.0	3.0	8.0	0.0	0.0	4.0	9.3	9.3	1.0	0.0	0.0
Prop In Lane	0.97		1.00	0.51		0.47	1.00		0.13	1.00		0.12
Lane Grp Cap(c), veh/h	271	0	230	267	0	0	150	790	813	488	1127	1162
V/C Ratio(X)	0.15	0.00	0.29	0.53	0.00	0.00	0.63	0.46	0.46	0.10	0.37	0.37
Avail Cap(c_a), veh/h	469	0	464	481	0	0	204	790	813	488	1127	1162
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.4	0.0	30.7	32.9	0.0	0.0	34.4	11.4	11.4	13.7	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.7	1.6	0.0	0.0	4.2	2.0	1.9	0.1	0.9	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	1.4	3.1	0.0	0.0	2.2	4.9	5.1	0.5	0.3	0.3
LnGrp Delay(d),s/veh	30.6	0.0	31.4	34.6	0.0	0.0	38.6	13.3	13.3	13.8	0.9	0.9
LnGrp LOS	C		C	C			D	B	B	B	A	A
Approach Vol, veh/h		107			142			838			899	
Approach Delay, s/veh		31.1			34.6			16.1			1.6	
Approach LOS		C			C			B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	25.6	39.0		15.4	10.6	54.0		15.4				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	9.5	34.5		22.5	8.5	35.5		22.5				
Max Q Clear Time (g_c+I1), s	3.0	11.3		5.0	6.0	2.0		10.0				
Green Ext Time (p_c), s	2.9	4.9		1.1	0.0	6.4		1.0				
Intersection Summary												
HCM 2010 Ctrl Delay			11.7									
HCM 2010 LOS			B									

HCM 2010 TWSC
5: Madison Street & Proj DWY 2

7/20/2016

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕		↙	↕	
Traffic Vol, veh/h	20	0	48	6	0	4	77	722	21	8	791	38
Future Vol, veh/h	20	0	48	6	0	4	77	722	21	8	791	38
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	60	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	22	0	53	7	0	4	86	802	23	9	879	42
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1490	1915	461	1442	1924	413	921	0	0	826	0	0
Stage 1	918	918	-	985	985	-	-	-	-	-	-	-
Stage 2	572	997	-	457	939	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	87	68	553	95	68	594	750	-	-	813	-	-
Stage 1	296	353	-	270	329	-	-	-	-	-	-	-
Stage 2	477	325	-	558	345	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	78	60	553	78	60	594	750	-	-	813	-	-
Mov Cap-2 Maneuver	78	60	-	78	60	-	-	-	-	-	-	-
Stage 1	262	349	-	239	291	-	-	-	-	-	-	-
Stage 2	419	288	-	499	341	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	34			38			1			0.1		
HCM LOS	D			E								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	750	-	-	198	120	813	-	-				
HCM Lane V/C Ratio	0.114	-	-	0.382	0.093	0.011	-	-				
HCM Control Delay (s)	10.4	-	-	34	38	9.5	-	-				
HCM Lane LOS	B	-	-	D	E	A	-	-				
HCM 95th %tile Q(veh)	0.4	-	-	1.7	0.3	0	-	-				

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	32	0	820	844	1
Future Vol, veh/h	0	32	0	820	844	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	35	0	901	927	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	464	929	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	5.3	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	3.1	-	-	-
Pot Cap-1 Maneuver	0	470	430	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	470	430	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	13.3	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	430	-	470	-	-	
HCM Lane V/C Ratio	-	-	0.075	-	-	
HCM Control Delay (s)	0	-	13.3	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.2	-	-	

HCM 2010 Signalized Intersection Summary

7: Madison Street & SR_91 WB

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰	↱	↰	↱			↱	↰
Traffic Volume (veh/h)	0	0	0	311	4	252	297	569	0	0	573	303
Future Volume (veh/h)	0	0	0	311	4	252	297	569	0	0	573	303
Number				3	8	18	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	1900	1900	1900	1900	0	0	1900	1900
Adj Flow Rate, veh/h				334	4	271	319	612	0	0	616	326
Adj No. of Lanes				0	1	1	1	2	0	0	3	1
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				416	5	376	674	2409	0	0	1271	396
Arrive On Green				0.23	0.23	0.23	0.74	1.00	0.00	0.00	0.08	0.08
Sat Flow, veh/h				1789	21	1615	1810	3705	0	0	5358	1615
Grp Volume(v), veh/h				338	0	271	319	612	0	0	616	326
Grp Sat Flow(s),veh/h/ln				1811	0	1615	1810	1805	0	0	1729	1615
Q Serve(g_s), s				14.1	0.0	12.4	5.6	0.0	0.0	0.0	9.1	15.9
Cycle Q Clear(g_c), s				14.1	0.0	12.4	5.6	0.0	0.0	0.0	9.1	15.9
Prop In Lane				0.99		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				421	0	376	674	2409	0	0	1271	396
V/C Ratio(X)				0.80	0.00	0.72	0.47	0.25	0.00	0.00	0.48	0.82
Avail Cap(c_a), veh/h				566	0	505	674	2409	0	0	1271	396
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	0.33	0.33
Upstream Filter(I)				1.00	0.00	1.00	0.95	0.95	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				29.0	0.0	28.3	7.1	0.0	0.0	0.0	31.9	35.1
Incr Delay (d2), s/veh				6.0	0.0	3.3	0.5	0.2	0.0	0.0	1.3	17.4
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				7.7	0.0	5.8	2.7	0.1	0.0	0.0	4.5	9.0
LnGrp Delay(d),s/veh				34.9	0.0	31.6	7.6	0.2	0.0	0.0	33.3	52.5
LnGrp LOS				C		C	A	A			C	D
Approach Vol, veh/h					609			931			942	
Approach Delay, s/veh					33.4			2.8			39.9	
Approach LOS					C			A			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		57.4			33.8	23.6		22.6				
Change Period (Y+Rc), s		4.5			4.5	4.5		4.5				
Max Green Setting (Gmax), s		46.5			22.9	19.1		24.5				
Max Q Clear Time (g_c+I1), s		2.0			7.6	17.9		16.1				
Green Ext Time (p_c), s		6.0			4.6	0.7		2.0				
Intersection Summary												
HCM 2010 Ctrl Delay				24.4								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary

8: Madison Street & SR_91 EB

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	114	22	77	0	0	0	0	752	369	260	623	0
Future Volume (veh/h)	114	22	77	0	0	0	0	752	369	260	623	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	1900	1900				0	1900	1900	1900	1900	0
Adj Flow Rate, veh/h	121	23	82				0	800	393	277	663	0
Adj No. of Lanes	1	0	1				0	3	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	182	0	162				0	2959	921	324	2886	0
Arrive On Green	0.10	0.10	0.10				0.00	0.19	0.19	0.36	1.00	0.00
Sat Flow, veh/h	1810	0	1615				0	5358	1615	1810	3705	0
Grp Volume(v), veh/h	121	0	82				0	800	393	277	663	0
Grp Sat Flow(s),veh/h/ln	1810	0	1615				0	1729	1615	1810	1805	0
Q Serve(g_s), s	5.2	0.0	3.8				0.0	10.6	17.2	11.3	0.0	0.0
Cycle Q Clear(g_c), s	5.2	0.0	3.8				0.0	10.6	17.2	11.3	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	182	0	162				0	2959	921	324	2886	0
V/C Ratio(X)	0.67	0.00	0.51				0.00	0.27	0.43	0.86	0.23	0.00
Avail Cap(c_a), veh/h	430	0	384				0	2959	921	498	2886	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	0.33	0.33	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.70	0.70	0.92	0.92	0.00
Uniform Delay (d), s/veh	34.7	0.0	34.1				0.0	18.2	20.9	24.7	0.0	0.0
Incr Delay (d2), s/veh	4.1	0.0	2.4				0.0	0.2	1.0	8.2	0.2	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	2.8	0.0	1.8				0.0	5.1	8.0	6.3	0.1	0.0
LnGrp Delay(d),s/veh	38.8	0.0	36.5				0.0	18.4	21.9	32.9	0.2	0.0
LnGrp LOS	D		D					B	C	C	A	
Approach Vol, veh/h		203						1193			940	
Approach Delay, s/veh		37.9						19.5			9.8	
Approach LOS		D						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	18.3	49.6		12.0		68.0						
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5						
Max Green Setting (Gmax), s	21.5	26.5		18.5		52.5						
Max Q Clear Time (g_c+1.3), s	13.3	19.2		7.2		2.0						
Green Ext Time (p_c), s	0.5	5.6		0.4		18.3						
Intersection Summary												
HCM 2010 Ctrl Delay			17.2									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary

9: Madison Street & Indiana Ave

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	218	767	36	21	156	306	35	599	38	221	309	170
Future Volume (veh/h)	218	767	36	21	156	306	35	599	38	221	309	170
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	237	834	39	23	170	333	38	651	41	240	336	185
Adj No. of Lanes	1	2	0	1	2	0	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, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	286	1221	57	75	417	373	178	877	55	284	708	382
Arrive On Green	0.16	0.35	0.35	0.04	0.23	0.23	0.10	0.25	0.25	0.26	0.52	0.52
Sat Flow, veh/h	1810	3512	164	1810	1805	1615	1810	3450	217	1810	2266	1223
Grp Volume(v), veh/h	237	429	444	23	170	333	38	340	352	240	266	255
Grp Sat Flow(s),veh/h/ln	1810	1805	1871	1810	1805	1615	1810	1805	1862	1810	1805	1684
Q Serve(g_s), s	10.2	16.2	16.3	1.0	6.4	16.0	1.5	13.9	13.9	10.1	7.5	7.7
Cycle Q Clear(g_c), s	10.2	16.2	16.3	1.0	6.4	16.0	1.5	13.9	13.9	10.1	7.5	7.7
Prop In Lane	1.00		0.09	1.00		1.00	1.00		0.12	1.00		0.73
Lane Grp Cap(c), veh/h	286	628	651	75	417	373	178	459	473	284	564	526
V/C Ratio(X)	0.83	0.68	0.68	0.31	0.41	0.89	0.21	0.74	0.74	0.85	0.47	0.48
Avail Cap(c_a), veh/h	294	628	651	170	417	373	178	459	473	294	564	526
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98
Uniform Delay (d), s/veh	32.6	22.3	22.3	37.2	26.1	29.8	33.2	27.4	27.4	28.6	14.9	15.0
Incr Delay (d2), s/veh	17.4	3.0	2.9	2.3	0.6	22.6	0.6	10.3	10.1	19.1	2.8	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	6.4	8.6	8.9	0.5	3.2	9.5	0.8	8.2	8.5	6.5	4.1	4.0
LnGrp Delay(d),s/veh	50.0	25.4	25.3	39.5	26.7	52.4	33.8	37.8	37.5	47.7	17.7	18.1
LnGrp LOS	D	C	C	D	C	D	C	D	D	D	B	B
Approach Vol, veh/h	1110			526			730			761		
Approach Delay, s/veh	30.6			43.6			37.4			27.3		
Approach LOS	C			D			D			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	16.5	24.3	7.3	31.8	11.9	29.0	16.6	22.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	12.5	19.0	7.0	23.5	7.0	24.5	12.5	18.0				
Max Q Clear Time (g_c+1.25), s	12.5	15.9	3.0	18.3	3.5	9.7	12.2	18.0				
Green Ext Time (p_c), s	0.0	1.3	0.0	2.8	1.4	2.8	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	33.6											
HCM 2010 LOS	C											

HCM 2010 TWSC
10: Madison Street & Evans Street

7/20/2016

Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↗		↙	↗	
Traffic Vol, veh/h	43	9	25	2	9	65	13	565	8	26	263	29
Future Vol, veh/h	43	9	25	2	9	65	13	565	8	26	263	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	80	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	47	10	27	2	10	71	14	614	9	28	286	32
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1045	1009	302	1024	1021	618	317	0	0	623	0	0
Stage 1	358	358	-	647	647	-	-	-	-	-	-	-
Stage 2	687	651	-	377	374	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	209	242	742	216	238	493	1255	-	-	968	-	-
Stage 1	664	631	-	463	470	-	-	-	-	-	-	-
Stage 2	440	468	-	649	621	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	168	232	742	195	229	493	1255	-	-	968	-	-
Mov Cap-2 Maneuver	168	232	-	195	229	-	-	-	-	-	-	-
Stage 1	657	613	-	458	465	-	-	-	-	-	-	-
Stage 2	365	463	-	597	603	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	28.7			15.7			0.2			0.7		
HCM LOS	D			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1255	-	-	234	419	968	-	-				
HCM Lane V/C Ratio	0.011	-	-	0.358	0.197	0.029	-	-				
HCM Control Delay (s)	7.9	-	-	28.7	15.7	8.8	-	-				
HCM Lane LOS	A	-	-	D	C	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	1.5	0.7	0.1	-	-				

HCM 2010 Signalized Intersection Summary

1: Madison Street & Magnolia Ave

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	92	688	174	259	632	38	105	369	122	37	473	86
Future Volume (veh/h)	92	688	174	259	632	38	105	369	122	37	473	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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	98	732	185	276	672	40	112	393	130	39	503	91
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	152	785	198	317	1268	75	172	686	224	170	780	140
Arrive On Green	0.08	0.28	0.28	0.17	0.37	0.37	0.03	0.08	0.08	0.09	0.25	0.25
Sat Flow, veh/h	1810	2856	722	1810	3463	206	1810	2676	875	1810	3057	551
Grp Volume(v), veh/h	98	463	454	276	350	362	112	264	259	39	296	298
Grp Sat Flow(s),veh/h/ln	1810	1805	1773	1810	1805	1864	1810	1805	1746	1810	1805	1803
Q Serve(g_s), s	4.2	20.0	20.0	11.9	12.2	12.2	4.9	11.2	11.4	1.6	11.7	11.8
Cycle Q Clear(g_c), s	4.2	20.0	20.0	11.9	12.2	12.2	4.9	11.2	11.4	1.6	11.7	11.8
Prop In Lane	1.00		0.41	1.00		0.11	1.00		0.50	1.00		0.31
Lane Grp Cap(c), veh/h	152	496	487	317	661	682	172	463	447	170	460	460
V/C Ratio(X)	0.65	0.93	0.93	0.87	0.53	0.53	0.65	0.57	0.58	0.23	0.64	0.65
Avail Cap(c_a), veh/h	222	496	487	317	661	682	172	463	447	170	460	460
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	28.3	28.3	32.1	19.9	19.9	37.4	32.4	32.5	33.6	26.6	26.6
Incr Delay (d2), s/veh	4.5	24.6	24.9	22.2	0.8	0.8	8.2	4.9	5.3	0.7	6.8	6.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	13.3	13.1	7.9	6.2	6.4	2.9	6.2	6.2	0.8	6.7	6.8
LnGrp Delay(d),s/veh	40.0	52.9	53.2	54.4	20.7	20.7	45.7	37.3	37.8	34.3	33.3	33.5
LnGrp LOS	D	D	D	D	C	C	D	D	D	C	C	C
Approach Vol, veh/h	1015				988				635			
Approach Delay, s/veh	51.8				30.1				39.0			
Approach LOS	D				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	11.5	24.5	18.0	26.0	11.6	24.4	10.7	33.3				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	7.0	20.0	13.5	21.5	7.1	19.9	9.3	25.7				
Max Q Clear Time (g_c+I1), s	3.6	13.4	13.9	22.0	6.9	13.8	6.2	14.2				
Green Ext Time (p_c), s	0.1	1.7	0.0	0.0	0.0	1.9	0.1	4.1				
Intersection Summary												
HCM 2010 Ctrl Delay	39.2											
HCM 2010 LOS	D											

HCM 2010 Signalized Intersection Summary

2: Madison Street & Elementary School Exit

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	1	31	1	25	1	608	0	0	846	0
Future Volume (veh/h)	0	0	1	31	1	25	1	608	0	0	846	0
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	1900	1900	1900	1900	1900	1900	1900	1900	0	0	1900	1900
Adj Flow Rate, veh/h	0	0	1	36	1	29	1	715	0	0	995	0
Adj No. of Lanes	0	1	0	1	0	1	0	2	0	0	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	0	80	98	0	249	45	2641	0	0	2692	0
Arrive On Green	0.00	0.00	0.05	0.05	0.15	0.15	1.00	1.00	0.00	0.00	1.00	0.00
Sat Flow, veh/h	0	0	1615	1810	0	1615	0	3627	0	0	3800	0
Grp Volume(v), veh/h	0	0	1	36	0	29	384	332	0	0	995	0
Grp Sat Flow(s),veh/h/ln	0	0	1615	1810	0	1615	1899	1643	0	0	1805	0
Q Serve(g_s), s	0.0	0.0	0.0	1.5	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	1.5	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		1.00	1.00		1.00	0.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	0	80	98	0	249	1461	1225	0	0	2692	0
V/C Ratio(X)	0.00	0.00	0.01	0.37	0.00	0.12	0.26	0.27	0.00	0.00	0.37	0.00
Avail Cap(c_a), veh/h	0	0	373	204	0	636	1461	1225	0	0	2692	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	0.68	0.00
Uniform Delay (d), s/veh	0.0	0.0	36.1	36.5	0.0	29.1	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.1	2.3	0.0	0.2	0.4	0.5	0.0	0.0	0.3	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	0.0	0.0	0.0	0.8	0.0	0.6	0.2	0.2	0.0	0.0	0.1	0.0
LnGrp Delay(d),s/veh	0.0	0.0	36.2	38.7	0.0	29.3	0.4	0.5	0.0	0.0	0.3	0.0
LnGrp LOS			D	D		C	A	A			A	
Approach Vol, veh/h		1			65			716			995	
Approach Delay, s/veh		36.2			34.5			0.5			0.3	
Approach LOS		D			C			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6		8				
Phs Duration (G+Y+Rc), s		63.7	8.4	8.0		63.7		16.3				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5		4.5				
Max Green Setting (Gmax), s		40.0	8.5	18.0		40.0		31.0				
Max Q Clear Time (g_c+I1), s		2.0	3.5	2.0		2.0		3.2				
Green Ext Time (p_c), s		16.5	0.0	0.0		16.5		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			1.6									
HCM 2010 LOS			A									

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↑↑			↑↑	
Traffic Vol, veh/h	8	10	67	0	0	0	82	601	15	35	803	39
Future Vol, veh/h	8	10	67	0	0	0	82	601	15	35	803	39
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	4	11	74	0	0	0	91	668	17	39	892	43
Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	1508	1859	468				936	0	0	684	0	0
Stage 1	992	992	-				-	-	-	-	-	-
Stage 2	516	867	-				-	-	-	-	-	-
Critical Hdwy	6.8	6.5	6.9				4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.8	5.5	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.8	5.5	-				-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3				2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	114	74	547				740	-	-	919	-	-
Stage 1	324	326	-				-	-	-	-	-	-
Stage 2	570	373	-				-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	83	0	547				740	-	-	919	-	-
Mov Cap-2 Maneuver	83	0	-				-	-	-	-	-	-
Stage 1	295	0	-				-	-	-	-	-	-
Stage 2	457	0	-				-	-	-	-	-	-
Approach	EB						NB			SB		
HCM Control Delay, s	16						1.2			0.4		
HCM LOS	C											
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR					
Capacity (veh/h)	740	-	-	416	919	-	-					
HCM Lane V/C Ratio	0.123	-	-	0.216	0.042	-	-					
HCM Control Delay (s)	10.5	-	-	16	9.1	-	-					
HCM Lane LOS	B	-	-	C	A	-	-					
HCM 95th %tile Q(veh)	0.4	-	-	0.8	0.1	-	-					

HCM 2010 Signalized Intersection Summary 4: Madison Street & Proj DWY 1/Garden Street

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	6	122	137	9	60	164	583	47	84	744	77
Future Volume (veh/h)	78	6	122	137	9	60	164	583	47	84	744	77
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	87	7	136	152	10	67	182	648	52	93	827	86
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	176	33	214	258	24	86	340	1354	109	408	1444	150
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.25	0.53	0.53	0.45	0.88	0.88
Sat Flow, veh/h	509	149	952	815	107	381	1810	3386	271	1810	3301	343
Grp Volume(v), veh/h	230	0	0	229	0	0	182	345	355	93	452	461
Grp Sat Flow(s),veh/h/ln	1610	0	0	1304	0	0	1810	1805	1852	1810	1805	1839
Q Serve(g_s), s	0.0	0.0	0.0	3.5	0.0	0.0	7.0	9.6	9.6	2.5	5.0	5.0
Cycle Q Clear(g_c), s	10.0	0.0	0.0	13.5	0.0	0.0	7.0	9.6	9.6	2.5	5.0	5.0
Prop In Lane	0.38		0.59	0.66		0.29	1.00		0.15	1.00		0.19
Lane Grp Cap(c), veh/h	424	0	0	368	0	0	340	722	741	408	790	805
V/C Ratio(X)	0.54	0.00	0.00	0.62	0.00	0.00	0.54	0.48	0.48	0.23	0.57	0.57
Avail Cap(c_a), veh/h	556	0	0	488	0	0	340	722	741	408	790	805
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.9	0.0	0.0	29.3	0.0	0.0	27.0	13.5	13.5	17.7	3.1	3.1
Incr Delay (d2), s/veh	1.1	0.0	0.0	1.7	0.0	0.0	1.6	2.3	2.2	0.3	3.0	3.0
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	4.7	0.0	0.0	4.9	0.0	0.0	3.6	5.2	5.3	1.3	2.9	3.0
LnGrp Delay(d),s/veh	29.0	0.0	0.0	31.0	0.0	0.0	28.6	15.7	15.7	18.0	6.1	6.1
LnGrp LOS	C			C			C	B	B	B	A	A
Approach Vol, veh/h		230			229			882			1006	
Approach Delay, s/veh		29.0			31.0			18.4			7.2	
Approach LOS		C			C			B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	22.0	36.0		22.0	19.0	39.0		22.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	10.5	31.5		24.5	7.5	34.5		24.5				
Max Q Clear Time (g_c+I1), s	4.5	11.6		12.0	9.0	7.0		15.5				
Green Ext Time (p_c), s	0.4	4.3		2.4	0.0	6.6		2.0				
Intersection Summary												
HCM 2010 Ctrl Delay			15.9									
HCM 2010 LOS			B									

HCM 2010 TWSC
5: Madison Street & Proj DWY 2

7/20/2016

Intersection												
Int Delay, s/veh	11.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕		↙	↕	
Traffic Vol, veh/h	44	0	98	17	1	31	95	719	47	23	902	78
Future Vol, veh/h	44	0	98	17	1	31	95	719	47	23	902	78
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	60	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	46	0	103	18	1	33	100	757	49	24	949	82
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1618	2045	516	1505	2062	403	1032	0	0	806	0	0
Stage 1	1039	1039	-	982	982	-	-	-	-	-	-	-
Stage 2	579	1006	-	523	1080	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	70	57	509	85	55	603	681	-	-	828	-	-
Stage 1	250	310	-	271	330	-	-	-	-	-	-	-
Stage 2	473	321	-	510	297	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	57	47	509	59	46	603	681	-	-	828	-	-
Mov Cap-2 Maneuver	57	47	-	59	46	-	-	-	-	-	-	-
Stage 1	213	301	-	231	282	-	-	-	-	-	-	-
Stage 2	380	274	-	395	288	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	139.2			46.8			1.2			0.2		
HCM LOS	F			E								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	681	-	-	147	136	828	-	-				
HCM Lane V/C Ratio	0.147	-	-	1.017	0.379	0.029	-	-				
HCM Control Delay (s)	11.2	-	-	139.2	46.8	9.5	-	-				
HCM Lane LOS	B	-	-	F	E	A	-	-				
HCM 95th %tile Q(veh)	0.5	-	-	7.6	1.6	0.1	-	-				

HCM 2010 TWSC
6: Madison Street & Gas Stn Access

7/20/2016

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	26	0	860	1011	6
Future Vol, veh/h	0	26	0	860	1011	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	29	0	945	1111	7
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	559	1118	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	5.3	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	3.1	-	-	-
Pot Cap-1 Maneuver	0	409	349	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	409	349	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.5	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	349	-	409	-	-	
HCM Lane V/C Ratio	-	-	0.07	-	-	
HCM Control Delay (s)	0	-	14.5	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.2	-	-	

HCM 2010 Signalized Intersection Summary

7: Madison Street & SR_91 WB

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	208	1	221	260	639	0	0	742	296
Future Volume (veh/h)	0	0	0	208	1	221	260	639	0	0	742	296
Number				3	8	18	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	1900	1900	1900	1900	0	0	1900	1900
Adj Flow Rate, veh/h				210	1	223	263	645	0	0	749	299
Adj No. of Lanes				0	1	1	1	2	0	0	3	1
Peak Hour Factor				0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				322	2	289	694	2604	0	0	1491	464
Arrive On Green				0.18	0.18	0.18	0.77	1.00	0.00	0.00	0.38	0.38
Sat Flow, veh/h				1801	9	1615	1810	3705	0	0	5358	1615
Grp Volume(v), veh/h				211	0	223	263	645	0	0	749	299
Grp Sat Flow(s),veh/h/ln				1810	0	1615	1810	1805	0	0	1729	1615
Q Serve(g_s), s				8.7	0.0	10.5	3.8	0.0	0.0	0.0	8.8	12.1
Cycle Q Clear(g_c), s				8.7	0.0	10.5	3.8	0.0	0.0	0.0	8.8	12.1
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				324	0	289	694	2604	0	0	1491	464
V/C Ratio(X)				0.65	0.00	0.77	0.38	0.25	0.00	0.00	0.50	0.64
Avail Cap(c_a), veh/h				475	0	424	694	2604	0	0	1491	464
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.33	1.33
Upstream Filter(I)				1.00	0.00	1.00	0.94	0.94	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				30.5	0.0	31.3	6.2	0.0	0.0	0.0	20.3	21.4
Incr Delay (d2), s/veh				2.2	0.0	5.2	0.3	0.2	0.0	0.0	1.2	6.7
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				4.5	0.0	5.1	1.8	0.1	0.0	0.0	4.3	6.2
LnGrp Delay(d),s/veh				32.8	0.0	36.5	6.5	0.2	0.0	0.0	21.5	28.1
LnGrp LOS				C		D	A	A			C	C
Approach Vol, veh/h					434			908			1048	
Approach Delay, s/veh					34.7			2.0			23.4	
Approach LOS					C			A			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		61.7			34.7	27.0		18.3				
Change Period (Y+Rc), s		4.5			4.5	4.5		4.5				
Max Green Setting (Gmax), s		50.5			23.5	22.5		20.5				
Max Q Clear Time (g_c+I1), s		2.0			5.8	14.1		12.5				
Green Ext Time (p_c), s		6.1			5.0	3.9		1.3				
Intersection Summary												
HCM 2010 Ctrl Delay			17.3									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary

8: Madison Street & SR_91 EB

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	164	3	144	0	0	0	0	735	396	236	714	0
Future Volume (veh/h)	164	3	144	0	0	0	0	735	396	236	714	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	1900	1900				0	1900	1900	1900	1900	0
Adj Flow Rate, veh/h	171	3	150				0	766	412	246	744	0
Adj No. of Lanes	1	0	1				0	3	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	237	0	211				0	2889	900	293	2776	0
Arrive On Green	0.13	0.13	0.13				0.00	0.18	0.18	0.32	1.00	0.00
Sat Flow, veh/h	1810	0	1615				0	5358	1615	1810	3705	0
Grp Volume(v), veh/h	171	0	150				0	766	412	246	744	0
Grp Sat Flow(s),veh/h/ln	1810	0	1615				0	1729	1615	1810	1805	0
Q Serve(g_s), s	7.3	0.0	7.1				0.0	10.1	18.2	10.1	0.0	0.0
Cycle Q Clear(g_c), s	7.3	0.0	7.1				0.0	10.1	18.2	10.1	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	237	0	211				0	2889	900	293	2776	0
V/C Ratio(X)	0.72	0.00	0.71				0.00	0.27	0.46	0.84	0.27	0.00
Avail Cap(c_a), veh/h	452	0	404				0	2889	900	452	2776	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	0.33	0.33	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.63	0.63	0.92	0.92	0.00
Uniform Delay (d), s/veh	33.4	0.0	33.3				0.0	18.6	21.9	26.1	0.0	0.0
Incr Delay (d2), s/veh	4.1	0.0	4.3				0.0	0.1	1.1	7.6	0.2	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	8.9	0.0	3.4				0.0	4.9	8.4	5.5	0.1	0.0
LnGrp Delay(d),s/veh	37.5	0.0	37.6				0.0	18.7	22.9	33.7	0.2	0.0
LnGrp LOS	D		D					B	C	C	A	
Approach Vol, veh/h		321						1178			990	
Approach Delay, s/veh		37.6						20.2			8.5	
Approach LOS		D						C			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	7.0	48.6		14.5		65.5						
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5						
Max Green Setting (Gmax), s	19.5	27.5		19.5		51.5						
Max Q Clear Time (g_c+1/2), s	12.1	20.2		9.3		2.0						
Green Ext Time (p_c), s	0.4	5.7		0.7		19.2						
Intersection Summary												
HCM 2010 Ctrl Delay			17.8									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary

9: Madison Street & Indiana Ave

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	284	551	85	59	231	328	59	518	40	231	530	98
Future Volume (veh/h)	284	551	85	59	231	328	59	518	40	231	530	98
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	299	580	89	62	243	345	62	545	42	243	558	103
Adj No. of Lanes	1	2	0	1	2	0	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, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	317	1050	161	130	417	373	170	828	64	271	914	168
Arrive On Green	0.17	0.33	0.33	0.07	0.23	0.23	0.09	0.24	0.24	0.15	0.30	0.30
Sat Flow, veh/h	1810	3140	481	1810	1805	1615	1810	3398	261	1810	3046	560
Grp Volume(v), veh/h	299	333	336	62	243	345	62	289	298	243	330	331
Grp Sat Flow(s),veh/h/ln	1810	1805	1815	1810	1805	1615	1810	1805	1854	1810	1805	1801
Q Serve(g_s), s	13.1	12.0	12.1	2.6	9.6	16.7	2.6	11.5	11.6	10.5	12.5	12.6
Cycle Q Clear(g_c), s	13.1	12.0	12.1	2.6	9.6	16.7	2.6	11.5	11.6	10.5	12.5	12.6
Prop In Lane	1.00		0.26	1.00		1.00	1.00		0.14	1.00		0.31
Lane Grp Cap(c), veh/h	317	604	607	130	417	373	170	440	452	271	542	540
V/C Ratio(X)	0.94	0.55	0.55	0.48	0.58	0.92	0.37	0.66	0.66	0.90	0.61	0.61
Avail Cap(c_a), veh/h	317	604	607	170	417	373	170	440	452	271	542	540
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	0.96	0.96	0.96
Uniform Delay (d), s/veh	32.6	21.7	21.7	35.7	27.3	30.1	34.0	27.2	27.3	33.4	24.0	24.0
Incr Delay (d2), s/veh	36.0	1.1	1.1	2.7	2.0	28.2	1.3	7.5	7.4	28.5	4.9	4.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	6.2	6.3	1.4	5.0	10.3	1.4	6.6	6.8	7.4	7.0	7.0
LnGrp Delay(d),s/veh	68.7	22.8	22.8	38.4	29.4	58.3	35.3	34.7	34.6	61.8	28.8	28.9
LnGrp LOS	E	C	C	D	C	E	D	C	C	E	C	C
Approach Vol, veh/h	968		650				649		904			
Approach Delay, s/veh	37.0		45.6				34.7		37.8			
Approach LOS	D		D				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	16.0	23.5	9.7	30.8	11.5	28.0	18.0	22.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	11.5	19.0	7.0	24.5	7.0	23.5	13.5	18.0				
Max Q Clear Time (g_c+1.5), s	12.5	13.6	4.6	14.1	4.6	14.6	15.1	18.7				
Green Ext Time (p_c), s	0.0	1.8	0.0	5.6	0.9	2.7	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			38.5									
HCM 2010 LOS			D									

HCM 2010 TWSC
10: Madison Street & Evans Street

7/20/2016

Intersection												
Int Delay, s/veh	4.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	49	5	30	4	3	58	26	452	15	76	527	43
Future Vol, veh/h	49	5	30	4	3	58	26	452	15	76	527	43
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	80	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	51	5	31	4	3	60	27	471	16	79	549	45
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1295	1271	571	1281	1285	479	594	0	0	486	0	0
Stage 1	730	730	-	533	533	-	-	-	-	-	-	-
Stage 2	565	541	-	748	752	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	141	169	524	144	166	591	992	-	-	1087	-	-
Stage 1	417	431	-	534	528	-	-	-	-	-	-	-
Stage 2	513	524	-	408	421	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	115	152	524	122	150	591	992	-	-	1087	-	-
Mov Cap-2 Maneuver	115	152	-	122	150	-	-	-	-	-	-	-
Stage 1	406	400	-	519	514	-	-	-	-	-	-	-
Stage 2	445	510	-	351	390	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	50.1			14.9			0.5			1		
HCM LOS	F			B								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	992	-	-	163	431	1087	-	-				
HCM Lane V/C Ratio	0.027	-	-	0.537	0.157	0.073	-	-				
HCM Control Delay (s)	8.7	-	-	50.1	14.9	8.6	-	-				
HCM Lane LOS	A	-	-	F	B	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	2.7	0.6	0.2	-	-				

HCM 2010 Signalized Intersection Summary

1: Madison Street & Magnolia Ave

7/6/2016

																
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR				
Lane Configurations																
Traffic Volume (veh/h)	149	824	138	138	475	54	121	427	146	48	453	175				
Future Volume (veh/h)	149	824	138	138	475	54	121	427	146	48	453	175				
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900				
Adj Flow Rate, veh/h	182	1005	168	168	579	66	148	521	178	59	552	213				
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0				
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82				
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0				
Cap, veh/h	230	1022	171	204	1030	117	181	698	237	170	657	253				
Arrive On Green	0.13	0.33	0.33	0.11	0.32	0.32	0.20	0.53	0.53	0.09	0.26	0.26				
Sat Flow, veh/h	1810	3097	517	1810	3268	372	1810	2646	900	1810	2551	981				
Grp Volume(v), veh/h	182	585	588	168	319	326	148	355	344	59	390	375				
Grp Sat Flow(s),veh/h/ln	1810	1805	1809	1810	1805	1834	1810	1805	1741	1810	1805	1727				
Q Serve(g_s), s	7.8	25.7	25.8	7.3	11.8	11.8	6.3	12.2	12.4	2.4	16.4	16.5				
Cycle Q Clear(g_c), s	7.8	25.7	25.8	7.3	11.8	11.8	6.3	12.2	12.4	2.4	16.4	16.5				
Prop In Lane	1.00		0.29	1.00		0.20	1.00		0.52	1.00		0.57				
Lane Grp Cap(c), veh/h	230	596	597	204	569	578	181	476	459	170	465	445				
V/C Ratio(X)	0.79	0.98	0.98	0.83	0.56	0.56	0.82	0.74	0.75	0.35	0.84	0.84				
Avail Cap(c_a), veh/h	258	596	597	204	569	578	181	476	459	170	465	445				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00				
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98	1.00	1.00	1.00				
Uniform Delay (d), s/veh	33.9	26.6	26.6	34.7	22.8	22.8	31.3	16.8	16.8	34.0	28.1	28.2				
Incr Delay (d2), s/veh	13.8	32.4	32.8	23.4	1.3	1.3	24.1	9.9	10.5	1.2	16.5	17.4				
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	4.8	18.0	18.2	5.0	6.1	6.2	4.3	7.2	7.1	1.3	10.3	10.0				
LnGrp Delay(d),s/veh	47.7	58.9	59.4	58.1	24.0	24.1	55.4	26.7	27.3	35.2	44.6	45.6				
LnGrp LOS	D	E	E	E	C	C	E	C	C	D	D	D				
Approach Vol, veh/h	1355				813				847							
Approach Delay, s/veh	57.6				31.1				32.0							
Approach LOS	E				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	11.5	25.1	13.0	30.4	12.0	24.6	14.2	29.2								
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5								
Max Green Setting (Gmax), s	7.0	20.6	8.5	25.9	7.5	20.1	10.9	23.5								
Max Q Clear Time (g_c+I1), s	4.4	14.4	9.3	27.8	8.3	18.5	9.8	13.8								
Green Ext Time (p_c), s	1.3	2.3	0.0	0.0	0.0	0.8	0.1	7.1								
Intersection Summary																
HCM 2010 Ctrl Delay	43.5															
HCM 2010 LOS	D															

HCM 2010 Signalized Intersection Summary

2: Madison Street & Elementary School Exit

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	121	0	83	0	575	0	0	720	0
Future Volume (veh/h)	0	0	0	121	0	83	0	575	0	0	720	0
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	1900	1900	1900	1900	0	1900	0	1900	0	0	1900	1900
Adj Flow Rate, veh/h	0	0	0	142	0	98	0	676	0	0	847	0
Adj No. of Lanes	0	1	0	1	0	1	0	2	0	0	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	2	0	191	0	0	0	2868	0	0	2868	0
Arrive On Green	0.00	0.00	0.00	0.11	0.00	0.01	0.00	1.00	0.00	0.00	1.00	0.00
Sat Flow, veh/h	0-76000		0	1810	142		0	3800	0	0	3800	0
Grp Volume(v), veh/h	0	0	0	142	40.4		0	676	0	0	847	0
Grp Sat Flow(s),veh/h/ln	0	1900	0	1810	D		0	1805	0	0	1805	0
Q Serve(g_s), s	0.0	0.0	0.0	6.1			0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	6.1			0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		0.00	1.00			0.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	2	0	191			0	2868	0	0	2868	0
V/C Ratio(X)	0.00	0.00	0.00	0.74			0.00	0.24	0.00	0.00	0.30	0.00
Avail Cap(c_a), veh/h	0	439	0	362			0	2868	0	0	2868	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	2.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	0.00	0.00	0.00	1.00			0.00	1.00	0.00	0.00	0.47	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	34.7			0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	5.7			0.0	0.2	0.0	0.0	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	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	3.3			0.0	0.1	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	40.4			0.0	0.2	0.0	0.0	0.1	0.0
LnGrp LOS				D				A			A	
Approach Vol, veh/h		0						676			847	
Approach Delay, s/veh		0.0						0.2			0.1	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6						
Phs Duration (G+Y+Rc), s		67.6	12.4	0.0		67.6						
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5						
Max Green Setting (Gmax), s		33.0	15.5	18.0		33.0						
Max Q Clear Time (g_c+l1), s		2.0	8.1	0.0		2.0						
Green Ext Time (p_c), s		13.6	0.2	0.0		13.6						
Intersection Summary												
HCM 2010 Ctrl Delay			3.6									
HCM 2010 LOS			A									

Intersection

Int Delay, s/veh 2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	11	23	114	0	0	0	60	564	91	124	640	78
Future Vol, veh/h	11	23	114	0	0	0	60	564	91	124	640	78
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	6	27	134	0	0	0	71	664	107	146	753	92

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1564	2003	422	845	0	0	771	0	0
Stage 1	1091	1091	-	-	-	-	-	-	-
Stage 2	473	912	-	-	-	-	-	-	-
Critical Hdwy	6.8	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.8	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.8	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	104	60	586	800	-	-	853	-	-
Stage 1	288	293	-	-	-	-	-	-	-
Stage 2	599	355	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	59	0	586	800	-	-	853	-	-
Mov Cap-2 Maneuver	59	0	-	-	-	-	-	-	-
Stage 1	193	0	-	-	-	-	-	-	-
Stage 2	504	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.4	0.8	1.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR
Capacity (veh/h)	800	-	-	415	853	-	-
HCM Lane V/C Ratio	0.088	-	-	0.404	0.171	-	-
HCM Control Delay (s)	9.9	-	-	19.4	10.1	-	-
HCM Lane LOS	A	-	-	C	B	-	-
HCM 95th %tile Q(veh)	0.3	-	-	1.9	0.6	-	-

HCM 2010 Signalized Intersection Summary

4: Madison Street & Proj DWY 1/Garden Street

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	1	7	67	0	62	15	623	44	44	711	18
Future Volume (veh/h)	12	1	7	67	0	62	15	623	44	44	711	18
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	13	1	8	75	0	70	17	700	49	49	799	20
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	172	27	73	159	11	94	61	1498	105	516	2479	62
Arrive On Green	0.13	0.13	0.13	0.13	0.00	0.13	0.07	0.88	0.88	0.57	1.00	1.00
Sat Flow, veh/h	787	213	572	709	85	741	1810	3423	239	1810	3599	90
Grp Volume(v), veh/h	22	0	0	145	0	0	17	369	380	49	401	418
Grp Sat Flow(s),veh/h/ln	1572	0	0	1535	0	0	1810	1805	1858	1810	1805	1884
Q Serve(g_s), s	0.0	0.0	0.0	6.3	0.0	0.0	0.7	3.5	3.5	1.0	0.0	0.0
Cycle Q Clear(g_c), s	0.9	0.0	0.0	7.2	0.0	0.0	0.7	3.5	3.5	1.0	0.0	0.0
Prop In Lane	0.59		0.36	0.52		0.48	1.00		0.13	1.00		0.05
Lane Grp Cap(c), veh/h	272	0	0	264	0	0	61	790	813	516	1243	1298
V/C Ratio(X)	0.08	0.00	0.00	0.55	0.00	0.00	0.28	0.47	0.47	0.09	0.32	0.32
Avail Cap(c_a), veh/h	505	0	0	506	0	0	204	790	813	516	1243	1298
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.8	0.0	0.0	33.6	0.0	0.0	36.4	3.0	3.0	12.5	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	1.8	0.0	0.0	2.4	2.0	1.9	0.1	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	3.2	0.0	0.0	0.4	1.9	1.9	0.5	0.2	0.2
LnGrp Delay(d),s/veh	31.0	0.0	0.0	35.3	0.0	0.0	38.8	5.0	5.0	12.6	0.7	0.7
LnGrp LOS	C			D			D	A	A	B	A	A
Approach Vol, veh/h		22			145			766			868	
Approach Delay, s/veh		31.0			35.3			5.7			1.3	
Approach LOS		C			D			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	26.8	39.0		14.2	6.7	59.1		14.2				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	9.5	34.5		22.5	8.5	35.5		22.5				
Max Q Clear Time (g_c+I1), s	3.0	5.5		2.9	2.7	2.0		9.2				
Green Ext Time (p_c), s	1.5	5.2		0.9	0.0	6.1		0.7				
Intersection Summary												
HCM 2010 Ctrl Delay			6.3									
HCM 2010 LOS			A									

HCM 2010 TWSC
5: Madison Street & Proj DWY 2

7/6/2016

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	0	19	6	0	4	41	676	21	8	764	13
Future Vol, veh/h	2	0	19	6	0	4	41	676	21	8	764	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	60	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	0	21	7	0	4	46	751	23	9	849	14
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1341	1740	432	1296	1735	387	863	0	0	774	0	0
Stage 1	874	874	-	854	854	-	-	-	-	-	-	-
Stage 2	467	866	-	442	881	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	113	88	577	122	89	617	788	-	-	851	-	-
Stage 1	315	370	-	324	378	-	-	-	-	-	-	-
Stage 2	551	373	-	570	367	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	106	82	577	111	83	617	788	-	-	851	-	-
Mov Cap-2 Maneuver	106	82	-	111	83	-	-	-	-	-	-	-
Stage 1	297	366	-	305	356	-	-	-	-	-	-	-
Stage 2	515	351	-	543	363	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	14.4			28.4			0.5			0.1		
HCM LOS	B			D								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	788	-	-	405	165	851	-	-				
HCM Lane V/C Ratio	0.058	-	-	0.058	0.067	0.01	-	-				
HCM Control Delay (s)	9.8	-	-	14.4	28.4	9.3	-	-				
HCM Lane LOS	A	-	-	B	D	A	-	-				
HCM 95th %tile Q(veh)	0.2	-	-	0.2	0.2	0	-	-				

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	33	0	738	788	1
Future Vol, veh/h	0	33	0	738	788	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	36	0	811	866	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	434	867	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	5.3	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	3.1	-	-	-
Pot Cap-1 Maneuver	0	492	460	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	492	460	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.9	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	460	-	492	-	-	
HCM Lane V/C Ratio	-	-	0.074	-	-	
HCM Control Delay (s)	0	-	12.9	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.2	-	-	

HCM 2010 Signalized Intersection Summary

7: Madison Street & SR_91 WB

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰	↱	↰	↱			↱	↰
Traffic Volume (veh/h)	0	0	0	317	4	228	303	510	0	0	532	289
Future Volume (veh/h)	0	0	0	317	4	228	303	510	0	0	532	289
Number				3	8	18	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	1900	1900	1900	1900	0	0	1900	1900
Adj Flow Rate, veh/h				341	4	245	326	548	0	0	572	311
Adj No. of Lanes				0	1	1	1	2	0	0	3	1
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				422	5	380	669	2399	0	0	1271	396
Arrive On Green				0.24	0.24	0.24	0.74	1.00	0.00	0.00	0.08	0.08
Sat Flow, veh/h				1790	21	1615	1810	3705	0	0	5358	1615
Grp Volume(v), veh/h				345	0	245	326	548	0	0	572	311
Grp Sat Flow(s),veh/h/ln				1811	0	1615	1810	1805	0	0	1729	1615
Q Serve(g_s), s				14.4	0.0	10.9	5.9	0.0	0.0	0.0	8.4	15.1
Cycle Q Clear(g_c), s				14.4	0.0	10.9	5.9	0.0	0.0	0.0	8.4	15.1
Prop In Lane				0.99		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				426	0	380	669	2399	0	0	1271	396
V/C Ratio(X)				0.81	0.00	0.64	0.49	0.23	0.00	0.00	0.45	0.79
Avail Cap(c_a), veh/h				566	0	505	669	2399	0	0	1271	396
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	0.33	0.33
Upstream Filter(I)				1.00	0.00	1.00	0.96	0.96	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				28.9	0.0	27.6	7.4	0.0	0.0	0.0	31.6	34.7
Incr Delay (d2), s/veh				6.5	0.0	1.8	0.5	0.2	0.0	0.0	1.2	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				8.0	0.0	5.0	2.8	0.1	0.0	0.0	4.2	8.4
LnGrp Delay(d),s/veh				35.3	0.0	29.4	7.9	0.2	0.0	0.0	32.8	49.2
LnGrp LOS				D		C	A	A			C	D
Approach Vol, veh/h					590			874			883	
Approach Delay, s/veh					32.9			3.1			38.6	
Approach LOS					C			A			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		57.2			33.6	23.6		22.8				
Change Period (Y+Rc), s		4.5			4.5	4.5		4.5				
Max Green Setting (Gmax), s		46.5			22.9	19.1		24.5				
Max Q Clear Time (g_c+I1), s		2.0			7.9	17.1		16.4				
Green Ext Time (p_c), s		5.4			4.2	1.0		1.9				
Intersection Summary												
HCM 2010 Ctrl Delay				23.9								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary

8: Madison Street & SR_91 EB

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	88	22	79	0	0	0	0	725	376	245	605	0
Future Volume (veh/h)	88	22	79	0	0	0	0	725	376	245	605	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	1900	1900				0	1900	1900	1900	1900	0
Adj Flow Rate, veh/h	94	23	84				0	771	400	261	644	0
Adj No. of Lanes	1	0	1				0	3	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	168	0	150				0	3043	947	309	2914	0
Arrive On Green	0.09	0.09	0.09				0.00	0.19	0.19	0.34	1.00	0.00
Sat Flow, veh/h	1810	0	1615				0	5358	1615	1810	3705	0
Grp Volume(v), veh/h	94	0	84				0	771	400	261	644	0
Grp Sat Flow(s),veh/h/ln	1810	0	1615				0	1729	1615	1810	1805	0
Q Serve(g_s), s	4.0	0.0	4.0				0.0	10.1	17.4	10.7	0.0	0.0
Cycle Q Clear(g_c), s	4.0	0.0	4.0				0.0	10.1	17.4	10.7	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	168	0	150				0	3043	947	309	2914	0
V/C Ratio(X)	0.56	0.00	0.56				0.00	0.25	0.42	0.85	0.22	0.00
Avail Cap(c_a), veh/h	430	0	384				0	3043	947	498	2914	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	0.33	0.33	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.71	0.71	0.94	0.94	0.00
Uniform Delay (d), s/veh	34.7	0.0	34.7				0.0	17.4	20.3	25.4	0.0	0.0
Incr Delay (d2), s/veh	2.9	0.0	3.3				0.0	0.1	1.0	6.9	0.2	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	2.1	0.0	1.9				0.0	4.9	8.1	5.8	0.1	0.0
LnGrp Delay(d),s/veh	37.6	0.0	38.0				0.0	17.5	21.3	32.3	0.2	0.0
LnGrp LOS	D		D					B	C	C	A	
Approach Vol, veh/h		178						1171			905	
Approach Delay, s/veh		37.8						18.8			9.4	
Approach LOS		D						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	17.6	50.9		11.4		68.6						
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5						
Max Green Setting (Gmax), s	21.5	26.5		18.5		52.5						
Max Q Clear Time (g_c+1.2), s	12.7	19.4		6.0		2.0						
Green Ext Time (p_c), s	0.5	5.3		0.4		17.5						
Intersection Summary												
HCM 2010 Ctrl Delay			16.6									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary

9: Madison Street & Indiana Ave

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Traffic Volume (veh/h)	215	782	37	21	159	305	36	582	39	220	295	168
Future Volume (veh/h)	215	782	37	21	159	305	36	582	39	220	295	168
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	234	850	40	23	173	332	39	633	42	239	321	183
Adj No. of Lanes	1	2	0	1	2	0	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, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	283	1214	57	75	416	373	182	882	58	283	699	390
Arrive On Green	0.16	0.35	0.35	0.04	0.23	0.23	0.10	0.26	0.26	0.26	0.52	0.52
Sat Flow, veh/h	1810	3511	165	1810	1805	1615	1810	3437	228	1810	2237	1248
Grp Volume(v), veh/h	234	437	453	23	173	332	39	332	343	239	258	246
Grp Sat Flow(s),veh/h/ln	1810	1805	1871	1810	1805	1615	1810	1805	1860	1810	1805	1680
Q Serve(g_s), s	10.0	16.7	16.7	1.0	6.5	15.9	1.6	13.4	13.4	10.0	7.2	7.4
Cycle Q Clear(g_c), s	10.0	16.7	16.7	1.0	6.5	15.9	1.6	13.4	13.4	10.0	7.2	7.4
Prop In Lane	1.00		0.09	1.00		1.00	1.00		0.12	1.00		0.74
Lane Grp Cap(c), veh/h	283	624	647	75	416	373	182	463	477	283	564	525
V/C Ratio(X)	0.83	0.70	0.70	0.31	0.42	0.89	0.21	0.72	0.72	0.85	0.46	0.47
Avail Cap(c_a), veh/h	294	624	647	170	417	373	182	463	477	294	564	525
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98
Uniform Delay (d), s/veh	32.7	22.6	22.6	37.2	26.2	29.8	33.1	27.1	27.1	28.6	14.9	14.9
Incr Delay (d2), s/veh	16.9	3.5	3.4	2.3	0.7	22.4	0.6	9.2	9.0	19.0	2.6	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	8.9	9.2	0.5	3.3	9.4	0.8	7.8	8.0	6.5	3.9	3.8
LnGrp Delay(d),s/veh	49.6	26.1	25.9	39.5	26.8	52.2	33.7	36.3	36.1	47.6	17.5	17.9
LnGrp LOS	D	C	C	D	C	D	C	D	D	D	B	B
Approach Vol, veh/h	1124					528		714		743		
Approach Delay, s/veh	30.9					43.4		36.0		27.3		
Approach LOS	C					D		D		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	16.5	24.5	7.3	31.7	12.0	29.0	16.5	22.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	12.5	19.0	7.0	23.5	7.0	24.5	12.5	18.0				
Max Q Clear Time (g_c+1.0), s	12.0	15.4	3.0	18.7	3.6	9.4	12.0	17.9				
Green Ext Time (p_c), s	0.0	1.4	0.0	2.6	1.4	2.7	0.1	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			33.3									
HCM 2010 LOS			C									

HCM 2010 TWSC
10: Madison Street & Evans Street

7/6/2016

Intersection												
Int Delay, s/veh	3.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	37	9	26	2	9	59	13	569	8	21	263	24
Future Vol, veh/h	37	9	26	2	9	59	13	569	8	21	263	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	80	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	40	10	28	2	10	64	14	618	9	23	286	26
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1033	1000	299	1015	1009	623	312	0	0	627	0	0
Stage 1	345	345	-	651	651	-	-	-	-	-	-	-
Stage 2	688	655	-	364	358	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	213	245	745	219	242	490	1260	-	-	965	-	-
Stage 1	675	640	-	461	468	-	-	-	-	-	-	-
Stage 2	440	466	-	659	631	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	174	237	745	199	234	490	1260	-	-	965	-	-
Mov Cap-2 Maneuver	174	237	-	199	234	-	-	-	-	-	-	-
Stage 1	668	625	-	456	463	-	-	-	-	-	-	-
Stage 2	370	461	-	609	616	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	25.6			15.6			0.2			0.6		
HCM LOS	D			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1260	-	-	252	414	965	-	-				
HCM Lane V/C Ratio	0.011	-	-	0.311	0.184	0.024	-	-				
HCM Control Delay (s)	7.9	-	-	25.6	15.6	8.8	-	-				
HCM Lane LOS	A	-	-	D	C	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	1.3	0.7	0.1	-	-				

HCM 2010 Signalized Intersection Summary

1: Madison Street & Magnolia Ave

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	702	166	253	645	39	97	357	114	38	460	88
Future Volume (veh/h)	94	702	166	253	645	39	97	357	114	38	460	88
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	100	747	177	269	686	41	103	380	121	40	489	94
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	152	797	189	316	1266	76	172	693	218	170	771	147
Arrive On Green	0.08	0.28	0.28	0.17	0.37	0.37	0.03	0.08	0.08	0.09	0.25	0.25
Sat Flow, veh/h	1810	2897	686	1810	3462	207	1810	2704	850	1810	3025	578
Grp Volume(v), veh/h	100	465	459	269	357	370	103	252	249	40	291	292
Grp Sat Flow(s),veh/h/ln	1810	1805	1779	1810	1805	1864	1810	1805	1750	1810	1805	1798
Q Serve(g_s), s	4.3	20.1	20.2	11.5	12.5	12.6	4.5	10.7	10.9	1.6	11.4	11.6
Cycle Q Clear(g_c), s	4.3	20.1	20.2	11.5	12.5	12.6	4.5	10.7	10.9	1.6	11.4	11.6
Prop In Lane	1.00		0.39	1.00		0.11	1.00		0.49	1.00		0.32
Lane Grp Cap(c), veh/h	152	496	489	316	660	681	172	463	448	170	460	458
V/C Ratio(X)	0.66	0.94	0.94	0.85	0.54	0.54	0.60	0.54	0.56	0.24	0.63	0.64
Avail Cap(c_a), veh/h	222	496	489	317	660	681	172	463	448	170	460	458
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	28.3	28.3	32.0	20.1	20.1	37.2	32.1	32.2	33.6	26.5	26.5
Incr Delay (d2), s/veh	4.7	25.7	25.9	19.2	0.9	0.9	5.5	4.5	4.8	0.7	6.5	6.6
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	2.3	13.5	13.3	7.4	6.4	6.6	2.5	5.9	5.9	0.9	6.5	6.5
LnGrp Delay(d),s/veh	40.2	54.0	54.3	51.2	21.0	21.0	42.7	36.6	37.0	34.3	32.9	33.1
LnGrp LOS	D	D	D	D	C	C	D	D	D	C	C	C
Approach Vol, veh/h		1024			996			604			623	
Approach Delay, s/veh		52.8			29.1			37.8			33.1	
Approach LOS		D			C			D			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	11.5	24.5	18.0	26.0	11.6	24.4	10.7	33.3				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	7.0	20.0	13.5	21.5	7.1	19.9	9.3	25.7				
Max Q Clear Time (g_c+I1), s	3.6	12.9	13.5	22.2	6.5	13.6	6.3	14.6				
Green Ext Time (p_c), s	0.1	1.7	0.0	0.0	0.0	1.9	0.1	4.1				
Intersection Summary												
HCM 2010 Ctrl Delay				39.0								
HCM 2010 LOS				D								

HCM 2010 Signalized Intersection Summary

2: Madison Street & Elementary School Exit

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	1	32	1	26	1	571	0	0	806	0
Future Volume (veh/h)	0	0	1	32	1	26	1	571	0	0	806	0
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	1900	1900	1900	1900	1900	1900	1900	1900	0	0	1900	1900
Adj Flow Rate, veh/h	0	0	1	38	1	31	1	672	0	0	948	0
Adj No. of Lanes	0	1	0	1	0	1	0	2	0	0	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	0	84	102	0	255	46	2628	0	0	2679	0
Arrive On Green	0.00	0.00	0.05	0.06	0.16	0.16	1.00	1.00	0.00	0.00	1.00	0.00
Sat Flow, veh/h	0	0	1615	1810	0	1615	1	3627	0	0	3800	0
Grp Volume(v), veh/h	0	0	1	38	0	31	361	312	0	0	948	0
Grp Sat Flow(s),veh/h/ln	0	0	1615	1810	0	1615	1899	1643	0	0	1805	0
Q Serve(g_s), s	0.0	0.0	0.0	1.6	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	1.6	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		1.00	1.00		1.00	0.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	0	84	102	0	255	1454	1219	0	0	2679	0
V/C Ratio(X)	0.00	0.00	0.01	0.37	0.00	0.12	0.25	0.26	0.00	0.00	0.35	0.00
Avail Cap(c_a), veh/h	0	0	373	204	0	636	1454	1219	0	0	2679	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	0.69	0.00
Uniform Delay (d), s/veh	0.0	0.0	36.0	36.4	0.0	28.9	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.1	2.3	0.0	0.2	0.4	0.5	0.0	0.0	0.3	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	0.0	0.0	0.0	0.9	0.0	0.6	0.2	0.2	0.0	0.0	0.1	0.0
LnGrp Delay(d),s/veh	0.0	0.0	36.0	38.7	0.0	29.1	0.4	0.5	0.0	0.0	0.3	0.0
LnGrp LOS			D	D		C	A	A			A	
Approach Vol, veh/h		1			69			673			948	
Approach Delay, s/veh		36.0			34.4			0.5			0.3	
Approach LOS		D			C			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6		8				
Phs Duration (G+Y+Rc), s		63.4	8.5	8.1		63.4		16.6				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5		4.5				
Max Green Setting (Gmax), s		40.0	8.5	18.0		40.0		31.0				
Max Q Clear Time (g_c+I1), s		2.0	3.6	2.0		2.0		3.3				
Green Ext Time (p_c), s		15.3	0.0	0.0		15.3		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay				1.7								
HCM 2010 LOS				A								

Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕↕			↕↕	
Traffic Vol, veh/h	8	10	57	0	0	0	73	564	15	36	762	40
Future Vol, veh/h	8	10	57	0	0	0	73	564	15	36	762	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	4	11	63	0	0	0	81	627	17	40	847	44
Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	1425	1755	446				891	0	0	643	0	0
Stage 1	949	949	-				-	-	-	-	-	-
Stage 2	476	806	-				-	-	-	-	-	-
Critical Hdwy	6.8	6.5	6.9				4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.8	5.5	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.8	5.5	-				-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3				2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	129	86	565				769	-	-	951	-	-
Stage 1	341	342	-				-	-	-	-	-	-
Stage 2	597	398	-				-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	99	0	565				769	-	-	951	-	-
Mov Cap-2 Maneuver	99	0	-				-	-	-	-	-	-
Stage 1	312	0	-				-	-	-	-	-	-
Stage 2	499	0	-				-	-	-	-	-	-
Approach	EB						NB			SB		
HCM Control Delay, s	15.2						1.1			0.4		
HCM LOS	C											
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR					
Capacity (veh/h)	769	-	-	432	951	-	-					
HCM Lane V/C Ratio	0.105	-	-	0.183	0.042	-	-					
HCM Control Delay (s)	10.2	-	-	15.2	9	-	-					
HCM Lane LOS	B	-	-	C	A	-	-					
HCM 95th %tile Q(veh)	0.4	-	-	0.7	0.1	-	-					

HCM 2010 Signalized Intersection Summary

4: Madison Street & Proj DWY 1/Garden Street

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	6	7	144	1	64	38	593	48	86	750	20
Future Volume (veh/h)	19	6	7	144	1	64	38	593	48	86	750	20
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	21	7	8	160	1	71	42	659	53	96	833	22
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	225	77	66	272	4	88	401	1354	109	469	1572	42
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.29	0.53	0.53	0.52	0.88	0.88
Sat Flow, veh/h	808	402	346	1024	22	461	1810	3385	272	1810	3593	95
Grp Volume(v), veh/h	36	0	0	232	0	0	42	351	361	96	418	437
Grp Sat Flow(s),veh/h/ln	1556	0	0	1507	0	0	1810	1805	1852	1810	1805	1883
Q Serve(g_s), s	0.0	0.0	0.0	10.4	0.0	0.0	1.4	9.8	9.8	2.3	4.3	4.3
Cycle Q Clear(g_c), s	1.3	0.0	0.0	11.7	0.0	0.0	1.4	9.8	9.8	2.3	4.3	4.3
Prop In Lane	0.58		0.22	0.69		0.31	1.00		0.15	1.00		0.05
Lane Grp Cap(c), veh/h	368	0	0	364	0	0	401	722	741	469	790	824
V/C Ratio(X)	0.10	0.00	0.00	0.64	0.00	0.00	0.10	0.49	0.49	0.20	0.53	0.53
Avail Cap(c_a), veh/h	549	0	0	543	0	0	401	722	741	469	790	824
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.7	0.0	0.0	30.8	0.0	0.0	22.4	13.5	13.5	14.8	3.1	3.1
Incr Delay (d2), s/veh	0.1	0.0	0.0	1.9	0.0	0.0	0.1	2.3	2.3	0.2	2.5	2.4
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	0.7	0.0	0.0	5.1	0.0	0.0	0.7	5.3	5.4	1.1	2.4	2.5
LnGrp Delay(d),s/veh	26.8	0.0	0.0	32.6	0.0	0.0	22.6	15.9	15.8	15.0	5.6	5.5
LnGrp LOS	C			C			C	B	B	B	A	A
Approach Vol, veh/h		36			232			754			951	
Approach Delay, s/veh		26.8			32.6			16.2			6.5	
Approach LOS		C			C			B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	24.7	36.0		19.3	21.7	39.0		19.3				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	10.5	31.5		24.5	7.5	34.5		24.5				
Max Q Clear Time (g_c+I1), s	4.3	11.8		3.3	3.4	6.3		13.7				
Green Ext Time (p_c), s	0.2	4.4		1.5	0.1	6.1		1.1				
Intersection Summary												
HCM 2010 Ctrl Delay				13.7								
HCM 2010 LOS				B								

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙ ↗		↙ ↗		↙ ↗	
Traffic Vol, veh/h	2	0	36	17	1	32	27	645	48	23	847	31
Future Vol, veh/h	2	0	36	17	1	32	27	645	48	23	847	31
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	60	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	0	38	18	1	34	28	679	51	24	892	33
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1353	1742	462	1255	1734	365	924	0	0	729	0	0
Stage 1	956	956	-	761	761	-	-	-	-	-	-	-
Stage 2	397	786	-	494	973	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	110	88	552	130	89	638	748	-	-	884	-	-
Stage 1	281	339	-	368	417	-	-	-	-	-	-	-
Stage 2	605	406	-	531	333	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	98	82	552	115	83	638	748	-	-	884	-	-
Mov Cap-2 Maneuver	98	82	-	115	83	-	-	-	-	-	-	-
Stage 1	270	330	-	354	401	-	-	-	-	-	-	-
Stage 2	550	391	-	481	324	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	13.9			24.4			0.4			0.2		
HCM LOS	B			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	748	-	-	444	238	884	-	-				
HCM Lane V/C Ratio	0.038	-	-	0.09	0.221	0.027	-	-				
HCM Control Delay (s)	10	-	-	13.9	24.4	9.2	-	-				
HCM Lane LOS	B	-	-	B	C	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.8	0.1	-	-				

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	27	0	719	894	6
Future Vol, veh/h	0	27	0	719	894	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	30	0	790	982	7
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	495	989	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	5.3	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	3.1	-	-	-
Pot Cap-1 Maneuver	0	449	402	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	449	402	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	13.6	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	402	-	449	-	-	
HCM Lane V/C Ratio	-	-	0.066	-	-	
HCM Control Delay (s)	0	-	13.6	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.2	-	-	

HCM 2010 Signalized Intersection Summary

7: Madison Street & SR_91 WB

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰	↱	↰	↱			↱	↰
Traffic Volume (veh/h)	0	0	0	212	1	181	265	539	0	0	658	262
Future Volume (veh/h)	0	0	0	212	1	181	265	539	0	0	658	262
Number				3	8	18	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	1900	1900	1900	1900	0	0	1900	1900
Adj Flow Rate, veh/h				214	1	183	268	544	0	0	665	265
Adj No. of Lanes				0	1	1	1	2	0	0	3	1
Peak Hour Factor				0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				290	1	260	727	2669	0	0	1491	464
Arrive On Green				0.16	0.16	0.16	0.80	1.00	0.00	0.00	0.38	0.38
Sat Flow, veh/h				1802	8	1615	1810	3705	0	0	5358	1615
Grp Volume(v), veh/h				215	0	183	268	544	0	0	665	265
Grp Sat Flow(s),veh/h/ln				1810	0	1615	1810	1805	0	0	1729	1615
Q Serve(g_s), s				9.1	0.0	8.6	3.3	0.0	0.0	0.0	7.6	10.4
Cycle Q Clear(g_c), s				9.1	0.0	8.6	3.3	0.0	0.0	0.0	7.6	10.4
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				291	0	260	727	2669	0	0	1491	464
V/C Ratio(X)				0.74	0.00	0.71	0.37	0.20	0.00	0.00	0.45	0.57
Avail Cap(c_a), veh/h				475	0	424	727	2669	0	0	1491	464
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.33	1.33
Upstream Filter(I)				1.00	0.00	1.00	0.96	0.96	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				32.0	0.0	31.8	5.0	0.0	0.0	0.0	20.0	20.8
Incr Delay (d2), s/veh				3.7	0.0	3.5	0.3	0.2	0.0	0.0	1.0	5.0
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				4.8	0.0	4.1	1.5	0.1	0.0	0.0	3.7	5.3
LnGrp Delay(d),s/veh				35.6	0.0	35.3	5.3	0.2	0.0	0.0	20.9	25.8
LnGrp LOS				D		D	A	A			C	C
Approach Vol, veh/h					398			812			930	
Approach Delay, s/veh					35.5			1.9			22.3	
Approach LOS					D			A			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		63.1			36.1	27.0		16.9				
Change Period (Y+Rc), s		4.5			4.5	4.5		4.5				
Max Green Setting (Gmax), s		50.5			23.5	22.5		20.5				
Max Q Clear Time (g_c+I1), s		2.0			5.3	12.4		11.1				
Green Ext Time (p_c), s		5.1			4.3	4.0		1.3				
Intersection Summary												
HCM 2010 Ctrl Delay				17.0								
HCM 2010 LOS				B								

HCM 2010 Signalized Intersection Summary

8: Madison Street & SR_91 EB

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	3	147	0	0	0	0	681	404	201	669	0
Future Volume (veh/h)	122	3	147	0	0	0	0	681	404	201	669	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	1900	1900				0	1900	1900	1900	1900	0
Adj Flow Rate, veh/h	127	3	153				0	709	421	209	697	0
Adj No. of Lanes	1	0	1				0	3	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	235	0	210				0	2998	934	257	2780	0
Arrive On Green	0.13	0.13	0.13				0.00	0.19	0.19	0.28	1.00	0.00
Sat Flow, veh/h	1810	0	1615				0	5358	1615	1810	3705	0
Grp Volume(v), veh/h	127	0	153				0	709	421	209	697	0
Grp Sat Flow(s),veh/h/ln	1810	0	1615				0	1729	1615	1810	1805	0
Q Serve(g_s), s	5.3	0.0	7.3				0.0	9.3	18.5	8.6	0.0	0.0
Cycle Q Clear(g_c), s	5.3	0.0	7.3				0.0	9.3	18.5	8.6	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	235	0	210				0	2998	934	257	2780	0
V/C Ratio(X)	0.54	0.00	0.73				0.00	0.24	0.45	0.81	0.25	0.00
Avail Cap(c_a), veh/h	452	0	404				0	2998	934	452	2780	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	0.33	0.33	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.67	0.67	0.94	0.94	0.00
Uniform Delay (d), s/veh	32.6	0.0	33.5				0.0	17.4	21.1	27.6	0.0	0.0
Incr Delay (d2), s/veh	1.9	0.0	4.8				0.0	0.1	1.1	5.8	0.2	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	2.7	0.0	3.5				0.0	4.5	8.6	4.7	0.1	0.0
LnGrp Delay(d),s/veh	34.5	0.0	38.3				0.0	17.5	22.2	33.4	0.2	0.0
LnGrp LOS	C		D					B	C	C	A	
Approach Vol, veh/h		280						1130			906	
Approach Delay, s/veh		36.6						19.3			7.9	
Approach LOS		D						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	15.4	50.2		14.4		65.6						
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5						
Max Green Setting (Gmax), s	19.5	27.5		19.5		51.5						
Max Q Clear Time (g_c+10), s	10.6	20.5		9.3		2.0						
Green Ext Time (p_c), s	0.4	5.3		0.6		17.5						
Intersection Summary												
HCM 2010 Ctrl Delay			16.9									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary

9: Madison Street & Indiana Ave

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	278	562	87	60	236	323	60	483	41	225	501	90
Future Volume (veh/h)	278	562	87	60	236	323	60	483	41	225	501	90
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	293	592	92	63	248	340	63	508	43	237	527	95
Adj No. of Lanes	1	2	0	1	2	0	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, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	317	1047	162	131	417	373	170	822	69	271	918	165
Arrive On Green	0.17	0.33	0.33	0.07	0.23	0.23	0.09	0.24	0.24	0.15	0.30	0.30
Sat Flow, veh/h	1810	3133	486	1810	1805	1615	1810	3370	285	1810	3059	549
Grp Volume(v), veh/h	293	340	344	63	248	340	63	271	280	237	310	312
Grp Sat Flow(s),veh/h/ln	1810	1805	1814	1810	1805	1615	1810	1805	1850	1810	1805	1803
Q Serve(g_s), s	12.8	12.4	12.4	2.7	9.8	16.4	2.6	10.7	10.8	10.2	11.6	11.7
Cycle Q Clear(g_c), s	12.8	12.4	12.4	2.7	9.8	16.4	2.6	10.7	10.8	10.2	11.6	11.7
Prop In Lane	1.00		0.27	1.00		1.00	1.00		0.15	1.00		0.30
Lane Grp Cap(c), veh/h	317	603	606	131	417	373	170	440	451	271	542	541
V/C Ratio(X)	0.93	0.56	0.57	0.48	0.59	0.91	0.37	0.62	0.62	0.87	0.57	0.58
Avail Cap(c_a), veh/h	317	603	606	170	417	373	170	440	451	271	542	541
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	0.97	0.97	0.97
Uniform Delay (d), s/veh	32.5	21.9	21.9	35.7	27.4	29.9	34.0	26.9	26.9	33.3	23.7	23.7
Incr Delay (d2), s/veh	31.9	1.2	1.2	2.7	2.3	25.7	1.3	6.4	6.3	24.7	4.2	4.3
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	0.2	6.4	6.4	1.4	5.2	9.9	1.4	6.1	6.3	7.0	6.4	6.4
LnGrp Delay(d),s/veh	64.4	23.1	23.1	38.4	29.7	55.6	35.4	33.3	33.2	58.0	27.9	28.0
LnGrp LOS	E	C	C	D	C	E	D	C	C	E	C	C
Approach Vol, veh/h		977			651			614			859	
Approach Delay, s/veh		35.5			44.1			33.5			36.2	
Approach LOS		D			D			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	16.0	23.5	9.8	30.7	11.5	28.0	18.0	22.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	11.5	19.0	7.0	24.5	7.0	23.5	13.5	18.0				
Max Q Clear Time (g_c+1.2), s	12.2	12.8	4.7	14.4	4.6	13.7	14.8	18.4				
Green Ext Time (p_c), s	0.0	1.9	0.0	5.5	0.9	2.7	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				37.1								
HCM 2010 LOS				D								

HCM 2010 TWSC
10: Madison Street & Evans Street

7/6/2016

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	39	5	31	4	3	48	27	450	15	67	527	34
Future Vol, veh/h	39	5	31	4	3	48	27	450	15	67	527	34
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	80	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	41	5	32	4	3	50	28	469	16	70	549	35
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1265	1247	567	1258	1257	477	584	0	0	484	0	0
Stage 1	706	706	-	533	533	-	-	-	-	-	-	-
Stage 2	559	541	-	725	724	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	147	175	527	149	173	592	1001	-	-	1089	-	-
Stage 1	430	442	-	534	528	-	-	-	-	-	-	-
Stage 2	517	524	-	420	433	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	123	159	527	127	157	592	1001	-	-	1089	-	-
Mov Cap-2 Maneuver	123	159	-	127	157	-	-	-	-	-	-	-
Stage 1	418	414	-	519	513	-	-	-	-	-	-	-
Stage 2	457	509	-	364	405	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	38.3			15			0.5			0.9		
HCM LOS	E			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1001	-	-	184	418	1089	-	-				
HCM Lane V/C Ratio	0.028	-	-	0.425	0.137	0.064	-	-				
HCM Control Delay (s)	8.7	-	-	38.3	15	8.5	-	-				
HCM Lane LOS	A	-	-	E	C	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	1.9	0.5	0.2	-	-				

HCM 2010 Signalized Intersection Summary

1: Madison Street & Magnolia Ave

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	149	824	145	145	475	54	126	437	151	48	467	175
Future Volume (veh/h)	149	824	145	145	475	54	126	437	151	48	467	175
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	182	1005	177	177	579	66	154	533	184	59	570	213
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	230	1013	178	204	1030	117	181	696	239	170	663	247
Arrive On Green	0.13	0.33	0.33	0.11	0.32	0.32	0.20	0.53	0.53	0.09	0.26	0.26
Sat Flow, veh/h	1810	3070	540	1810	3268	372	1810	2638	907	1810	2575	960
Grp Volume(v), veh/h	182	590	592	177	319	326	154	364	353	59	399	384
Grp Sat Flow(s),veh/h/ln	1810	1805	1805	1810	1805	1834	1810	1805	1740	1810	1805	1731
Q Serve(g_s), s	7.8	26.1	26.1	7.7	11.8	11.8	6.6	12.8	12.9	2.4	16.9	16.9
Cycle Q Clear(g_c), s	7.8	26.1	26.1	7.7	11.8	11.8	6.6	12.8	12.9	2.4	16.9	16.9
Prop In Lane	1.00		0.30	1.00		0.20	1.00		0.52	1.00		0.55
Lane Grp Cap(c), veh/h	230	596	596	204	569	578	181	476	459	170	465	446
V/C Ratio(X)	0.79	0.99	0.99	0.87	0.56	0.56	0.85	0.76	0.77	0.35	0.86	0.86
Avail Cap(c_a), veh/h	258	596	596	204	569	578	181	476	459	170	465	446
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.97	0.97	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.9	26.7	26.7	34.9	22.8	22.8	31.4	16.9	17.0	34.0	28.3	28.3
Incr Delay (d2), s/veh	13.8	34.5	35.1	30.7	1.3	1.3	29.5	10.9	11.5	1.2	18.3	19.2
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	4.8	18.7	18.8	5.6	6.1	6.2	4.7	7.7	7.5	1.3	10.7	10.5
LnGrp Delay(d),s/veh	47.7	61.2	61.8	65.7	24.0	24.1	60.9	27.8	28.4	35.2	46.6	47.6
LnGrp LOS	D	E	E	E	C	C	E	C	C	D	D	D
Approach Vol, veh/h	1364				822				871			
Approach Delay, s/veh	59.7				33.0				33.9			
Approach LOS	E				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	11.5	25.1	13.0	30.4	12.0	24.6	14.2	29.2				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	7.0	20.6	8.5	25.9	7.5	20.1	10.9	23.5				
Max Q Clear Time (g_c+I1), s	4.4	14.9	9.7	28.1	8.6	18.9	9.8	13.8				
Green Ext Time (p_c), s	1.3	2.2	0.0	0.0	0.0	0.6	0.1	7.2				
Intersection Summary												
HCM 2010 Ctrl Delay	45.4											
HCM 2010 LOS	D											

HCM 2010 Signalized Intersection Summary

2: Madison Street & Elementary School Exit

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	121	0	83	0	600	0	0	754	0
Future Volume (veh/h)	0	0	0	121	0	83	0	600	0	0	754	0
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	1900	1900	1900	1900	0	1900	0	1900	0	0	1900	1900
Adj Flow Rate, veh/h	0	0	0	142	0	98	0	706	0	0	887	0
Adj No. of Lanes	0	1	0	1	0	1	0	2	0	0	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	2	0	191	0	0	0	2868	0	0	2868	0
Arrive On Green	0.00	0.00	0.00	0.11	0.00	0.01	0.00	1.00	0.00	0.00	1.00	0.00
Sat Flow, veh/h	0-76000		0	1810	142		0	3800	0	0	3800	0
Grp Volume(v), veh/h	0	0	0	142	40.4		0	706	0	0	887	0
Grp Sat Flow(s),veh/h/ln	0	1900	0	1810	D		0	1805	0	0	1805	0
Q Serve(g_s), s	0.0	0.0	0.0	6.1			0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	6.1			0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		0.00	1.00			0.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	2	0	191			0	2868	0	0	2868	0
V/C Ratio(X)	0.00	0.00	0.00	0.74			0.00	0.25	0.00	0.00	0.31	0.00
Avail Cap(c_a), veh/h	0	439	0	362			0	2868	0	0	2868	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	2.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	0.00	0.00	0.00	1.00			0.00	1.00	0.00	0.00	0.43	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	34.7			0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	5.7			0.0	0.2	0.0	0.0	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	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	3.3			0.0	0.1	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	40.4			0.0	0.2	0.0	0.0	0.1	0.0
LnGrp LOS				D				A			A	
Approach Vol, veh/h		0						706			887	
Approach Delay, s/veh		0.0						0.2			0.1	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6						
Phs Duration (G+Y+Rc), s		67.6	12.4	0.0		67.6						
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5						
Max Green Setting (Gmax), s		33.0	15.5	18.0		33.0						
Max Q Clear Time (g_c+l1), s		2.0	8.1	0.0		2.0						
Green Ext Time (p_c), s		14.4	0.2	0.0		14.4						
Intersection Summary												
HCM 2010 Ctrl Delay			3.5									
HCM 2010 LOS			A									

Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↑↑			↑↑	
Traffic Vol, veh/h	11	23	121	0	0	0	65	589	91	124	674	78
Future Vol, veh/h	11	23	121	0	0	0	65	589	91	124	674	78
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	6	27	142	0	0	0	76	693	107	146	793	92
Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	1630	2084	442				885	0	0	800	0	0
Stage 1	1131	1131	-				-	-	-	-	-	-
Stage 2	499	953	-				-	-	-	-	-	-
Critical Hdwy	6.8	6.5	6.9				4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.8	5.5	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.8	5.5	-				-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3				2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	94	54	569				773	-	-	832	-	-
Stage 1	274	281	-				-	-	-	-	-	-
Stage 2	581	340	-				-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	50	0	569				773	-	-	832	-	-
Mov Cap-2 Maneuver	50	0	-				-	-	-	-	-	
Stage 1	178	0	-				-	-	-	-	-	-
Stage 2	476	0	-				-	-	-	-	-	-
Approach	EB						NB			SB		
HCM Control Delay, s	21.4						0.9			1.5		
HCM LOS	C											
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR					
Capacity (veh/h)	773	-	-	392	832	-	-					
HCM Lane V/C Ratio	0.099	-	-	0.449	0.175	-	-					
HCM Control Delay (s)	10.2	-	-	21.4	10.2	-	-					
HCM Lane LOS	B	-	-	C	B	-	-					
HCM 95th %tile Q(veh)	0.3	-	-	2.3	0.6	-	-					

HCM 2010 Signalized Intersection Summary

4: Madison Street & Proj DWY 1/Garden Street

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	1	60	66	2	61	84	631	44	44	726	45
Future Volume (veh/h)	35	1	60	66	2	61	84	631	44	44	726	45
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	39	1	67	74	2	69	94	709	49	49	816	51
Adj No. of Lanes	0	1	1	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	267	6	234	155	19	96	150	1499	104	485	2148	134
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.11	0.58	0.58	0.54	1.00	1.00
Sat Flow, veh/h	1229	40	1615	604	129	665	1810	3427	237	1810	3451	216
Grp Volume(v), veh/h	40	0	67	145	0	0	94	373	385	49	427	440
Grp Sat Flow(s),veh/h/ln	1269	0	1615	1398	0	0	1810	1805	1858	1810	1805	1862
Q Serve(g_s), s	0.0	0.0	3.0	5.8	0.0	0.0	4.0	9.5	9.6	1.1	0.0	0.0
Cycle Q Clear(g_c), s	2.3	0.0	3.0	8.1	0.0	0.0	4.0	9.5	9.6	1.1	0.0	0.0
Prop In Lane	0.97		1.00	0.51		0.48	1.00		0.13	1.00		0.12
Lane Grp Cap(c), veh/h	272	0	234	270	0	0	150	790	813	485	1123	1159
V/C Ratio(X)	0.15	0.00	0.29	0.54	0.00	0.00	0.63	0.47	0.47	0.10	0.38	0.38
Avail Cap(c_a), veh/h	467	0	464	481	0	0	204	790	813	485	1123	1159
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.2	0.0	30.5	32.9	0.0	0.0	34.4	11.4	11.4	13.8	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.7	1.7	0.0	0.0	4.2	2.0	2.0	0.1	1.0	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	1.4	3.2	0.0	0.0	2.2	5.2	5.3	0.5	0.3	0.3
LnGrp Delay(d),s/veh	30.5	0.0	31.2	34.5	0.0	0.0	38.6	13.4	13.4	13.9	1.0	0.9
LnGrp LOS	C		C	C			D	B	B	B	A	A
Approach Vol, veh/h		107			145			852			916	
Approach Delay, s/veh		30.9			34.5			16.2			1.7	
Approach LOS		C			C			B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	25.4	39.0		15.6	10.6	53.8		15.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	9.5	34.5		22.5	8.5	35.5		22.5				
Max Q Clear Time (g_c+I1), s	3.1	11.6		5.0	6.0	2.0		10.1				
Green Ext Time (p_c), s	3.0	5.0		1.2	0.0	6.6		1.0				
Intersection Summary												
HCM 2010 Ctrl Delay			11.7									
HCM 2010 LOS			B									

HCM 2010 TWSC
5: Madison Street & Proj DWY 2

7/20/2016

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕		↙	↕	
Traffic Vol, veh/h	20	0	48	6	0	4	78	735	21	8	806	38
Future Vol, veh/h	20	0	48	6	0	4	78	735	21	8	806	38
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	60	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	22	0	53	7	0	4	87	817	23	9	896	42
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1516	1947	469	1468	1958	420	938	0	0	840	0	0
Stage 1	934	934	-	1002	1002	-	-	-	-	-	-	-
Stage 2	582	1013	-	466	956	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	84	65	546	91	64	588	739	-	-	804	-	-
Stage 1	290	347	-	264	323	-	-	-	-	-	-	-
Stage 2	471	319	-	551	339	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	75	57	546	74	56	588	739	-	-	804	-	-
Mov Cap-2 Maneuver	75	57	-	74	56	-	-	-	-	-	-	-
Stage 1	256	343	-	233	285	-	-	-	-	-	-	-
Stage 2	412	281	-	492	335	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	35.4			40			1			0.1		
HCM LOS	E			E								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	739	-	-	192	114	804	-	-				
HCM Lane V/C Ratio	0.117	-	-	0.394	0.097	0.011	-	-				
HCM Control Delay (s)	10.5	-	-	35.4	40	9.5	-	-				
HCM Lane LOS	B	-	-	E	E	A	-	-				
HCM 95th %tile Q(veh)	0.4	-	-	1.7	0.3	0	-	-				

HCM 2010 TWSC
6: Madison Street & Gas Stn Access

7/20/2016

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	33	0	834	859	1
Future Vol, veh/h	0	33	0	834	859	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	36	0	916	944	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	473	945	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	5.3	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	3.1	-	-	-
Pot Cap-1 Maneuver	0	464	422	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	464	422	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	13.4	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	422	-	464	-	-	
HCM Lane V/C Ratio	-	-	0.078	-	-	
HCM Control Delay (s)	0	-	13.4	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.3	-	-	

HCM 2010 Signalized Intersection Summary

7: Madison Street & SR_91 WB

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	317	4	256	303	579	0	0	583	309
Future Volume (veh/h)	0	0	0	317	4	256	303	579	0	0	583	309
Number				3	8	18	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	1900	1900	1900	1900	0	0	1900	1900
Adj Flow Rate, veh/h				341	4	275	326	623	0	0	627	332
Adj No. of Lanes				0	1	1	1	2	0	0	3	1
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				423	5	382	667	2396	0	0	1271	396
Arrive On Green				0.24	0.24	0.24	0.74	1.00	0.00	0.00	0.08	0.08
Sat Flow, veh/h				1790	21	1615	1810	3705	0	0	5358	1615
Grp Volume(v), veh/h				345	0	275	326	623	0	0	627	332
Grp Sat Flow(s),veh/h/ln				1811	0	1615	1810	1805	0	0	1729	1615
Q Serve(g_s), s				14.4	0.0	12.5	5.9	0.0	0.0	0.0	9.3	16.2
Cycle Q Clear(g_c), s				14.4	0.0	12.5	5.9	0.0	0.0	0.0	9.3	16.2
Prop In Lane				0.99		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				428	0	382	667	2396	0	0	1271	396
V/C Ratio(X)				0.81	0.00	0.72	0.49	0.26	0.00	0.00	0.49	0.84
Avail Cap(c_a), veh/h				566	0	505	667	2396	0	0	1271	396
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	0.33	0.33
Upstream Filter(I)				1.00	0.00	1.00	0.94	0.94	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				28.8	0.0	28.1	7.4	0.0	0.0	0.0	32.0	35.2
Incr Delay (d2), s/veh				6.3	0.0	3.4	0.5	0.2	0.0	0.0	1.4	18.8
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				7.9	0.0	5.9	2.8	0.1	0.0	0.0	4.6	9.3
LnGrp Delay(d),s/veh				35.1	0.0	31.5	7.9	0.2	0.0	0.0	33.4	54.0
LnGrp LOS				D		C	A	A			C	D
Approach Vol, veh/h					620			949			959	
Approach Delay, s/veh					33.5			2.9			40.5	
Approach LOS					C			A			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		57.1			33.5	23.6		22.9				
Change Period (Y+Rc), s		4.5			4.5	4.5		4.5				
Max Green Setting (Gmax), s		46.5			22.9	19.1		24.5				
Max Q Clear Time (g_c+I1), s		2.0			7.9	18.2		16.4				
Green Ext Time (p_c), s		6.1			4.7	0.5		2.0				
Intersection Summary												
HCM 2010 Ctrl Delay				24.7								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary

8: Madison Street & SR_91 EB

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	22	79	0	0	0	0	766	376	265	635	0
Future Volume (veh/h)	116	22	79	0	0	0	0	766	376	265	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	1900	1900				0	1900	1900	1900	1900	0
Adj Flow Rate, veh/h	123	23	84				0	815	400	282	676	0
Adj No. of Lanes	1	0	1				0	3	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	184	0	164				0	2940	915	329	2882	0
Arrive On Green	0.10	0.10	0.10				0.00	0.19	0.19	0.36	1.00	0.00
Sat Flow, veh/h	1810	0	1615				0	5358	1615	1810	3705	0
Grp Volume(v), veh/h	123	0	84				0	815	400	282	676	0
Grp Sat Flow(s),veh/h/ln	1810	0	1615				0	1729	1615	1810	1805	0
Q Serve(g_s), s	5.2	0.0	3.9				0.0	10.8	17.5	11.5	0.0	0.0
Cycle Q Clear(g_c), s	5.2	0.0	3.9				0.0	10.8	17.5	11.5	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	184	0	164				0	2940	915	329	2882	0
V/C Ratio(X)	0.67	0.00	0.51				0.00	0.28	0.44	0.86	0.23	0.00
Avail Cap(c_a), veh/h	430	0	384				0	2940	915	498	2882	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	0.33	0.33	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.68	0.68	0.92	0.92	0.00
Uniform Delay (d), s/veh	34.6	0.0	34.1				0.0	18.5	21.2	24.5	0.0	0.0
Incr Delay (d2), s/veh	4.2	0.0	2.5				0.0	0.2	1.0	8.6	0.2	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	2.8	0.0	1.9				0.0	5.2	8.1	6.4	0.1	0.0
LnGrp Delay(d),s/veh	38.8	0.0	36.5				0.0	18.6	22.2	33.1	0.2	0.0
LnGrp LOS	D		D					B	C	C	A	
Approach Vol, veh/h		207						1215			958	
Approach Delay, s/veh		37.9						19.8			9.9	
Approach LOS		D						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	18.5	49.3		12.1		67.9						
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5						
Max Green Setting (Gmax), s	21.5	26.5		18.5		52.5						
Max Q Clear Time (g_c+1/3), s	11.5	19.5		7.2		2.0						
Green Ext Time (p_c), s	0.5	5.4		0.4		18.9						
Intersection Summary												
HCM 2010 Ctrl Delay			17.4									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary

9: Madison Street & Indiana Ave

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	222	782	37	21	159	312	36	610	39	225	315	173
Future Volume (veh/h)	222	782	37	21	159	312	36	610	39	225	315	173
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	241	850	40	23	173	339	39	663	42	245	342	188
Adj No. of Lanes	1	2	0	1	2	0	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, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	289	1228	58	75	417	373	174	861	54	288	708	382
Arrive On Green	0.16	0.35	0.35	0.04	0.23	0.23	0.10	0.25	0.25	0.27	0.52	0.52
Sat Flow, veh/h	1810	3511	165	1810	1805	1615	1810	3448	218	1810	2267	1223
Grp Volume(v), veh/h	241	437	453	23	173	339	39	347	358	245	271	259
Grp Sat Flow(s),veh/h/ln	1810	1805	1871	1810	1805	1615	1810	1805	1861	1810	1805	1684
Q Serve(g_s), s	10.3	16.6	16.6	1.0	6.5	16.3	1.6	14.3	14.3	10.3	7.7	7.9
Cycle Q Clear(g_c), s	10.3	16.6	16.6	1.0	6.5	16.3	1.6	14.3	14.3	10.3	7.7	7.9
Prop In Lane	1.00		0.09	1.00		1.00	1.00		0.12	1.00		0.73
Lane Grp Cap(c), veh/h	289	632	655	75	417	373	174	451	465	288	564	526
V/C Ratio(X)	0.83	0.69	0.69	0.31	0.41	0.91	0.22	0.77	0.77	0.85	0.48	0.49
Avail Cap(c_a), veh/h	294	632	655	170	417	373	174	451	465	294	564	526
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.97	0.97
Uniform Delay (d), s/veh	32.6	22.3	22.3	37.2	26.1	29.9	33.4	27.9	27.9	28.5	15.0	15.0
Incr Delay (d2), s/veh	18.0	3.2	3.1	2.3	0.7	25.2	0.6	12.0	11.7	19.7	2.8	3.2
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	6.6	8.8	9.1	0.5	3.3	9.9	0.8	8.6	8.9	6.7	4.2	4.1
LnGrp Delay(d),s/veh	50.5	25.5	25.4	39.5	26.8	55.1	34.0	39.8	39.6	48.2	17.8	18.2
LnGrp LOS	D	C	C	D	C	E	C	D	D	D	B	B
Approach Vol, veh/h	1131			535			744			775		
Approach Delay, s/veh	30.8			45.3			39.4			27.6		
Approach LOS	C			D			D			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	16.7	24.0	7.3	32.0	11.7	29.0	16.8	22.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	12.5	19.0	7.0	23.5	7.0	24.5	12.5	18.0				
Max Q Clear Time (g_c+1.2), s	12.3	16.3	3.0	18.6	3.6	9.9	12.3	18.3				
Green Ext Time (p_c), s	0.0	1.2	0.0	2.7	1.5	2.9	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	34.5											
HCM 2010 LOS	C											

HCM 2010 TWSC
10: Madison Street & Evans Street

7/20/2016

Intersection												
Int Delay, s/veh	3.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↗		↙	↗	
Traffic Vol, veh/h	44	9	26	2	9	66	13	576	8	26	268	29
Future Vol, veh/h	44	9	26	2	9	66	13	576	8	26	268	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	80	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	48	10	28	2	10	72	14	626	9	28	291	32
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1063	1027	307	1042	1038	630	323	0	0	635	0	0
Stage 1	364	364	-	659	659	-	-	-	-	-	-	-
Stage 2	699	663	-	383	379	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	203	236	738	210	233	485	1248	-	-	958	-	-
Stage 1	659	627	-	456	464	-	-	-	-	-	-	-
Stage 2	434	462	-	644	618	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	162	227	738	189	224	485	1248	-	-	958	-	-
Mov Cap-2 Maneuver	162	227	-	189	224	-	-	-	-	-	-	-
Stage 1	652	609	-	451	459	-	-	-	-	-	-	-
Stage 2	358	457	-	592	600	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	30			16			0.2			0.7		
HCM LOS	D			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1248	-	-	228	412	958	-	-				
HCM Lane V/C Ratio	0.011	-	-	0.377	0.203	0.029	-	-				
HCM Control Delay (s)	7.9	-	-	30	16	8.9	-	-				
HCM Lane LOS	A	-	-	D	C	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	1.7	0.8	0.1	-	-				

HCM 2010 Signalized Intersection Summary

1: Madison Street & Magnolia Ave

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	702	177	264	645	39	107	376	124	38	482	88
Future Volume (veh/h)	94	702	177	264	645	39	107	376	124	38	482	88
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	100	747	188	281	686	41	114	400	132	40	513	94
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	152	786	198	317	1266	76	172	686	224	170	778	142
Arrive On Green	0.08	0.28	0.28	0.17	0.37	0.37	0.03	0.08	0.08	0.09	0.25	0.25
Sat Flow, veh/h	1810	2859	719	1810	3462	207	1810	2677	874	1810	3050	557
Grp Volume(v), veh/h	100	472	463	281	357	370	114	268	264	40	303	304
Grp Sat Flow(s),veh/h/ln	1810	1805	1773	1810	1805	1864	1810	1805	1746	1810	1805	1802
Q Serve(g_s), s	4.3	20.5	20.5	12.1	12.5	12.6	5.0	11.4	11.6	1.6	12.0	12.1
Cycle Q Clear(g_c), s	4.3	20.5	20.5	12.1	12.5	12.6	5.0	11.4	11.6	1.6	12.0	12.1
Prop In Lane	1.00		0.41	1.00		0.11	1.00		0.50	1.00		0.31
Lane Grp Cap(c), veh/h	152	496	488	317	660	682	172	463	447	170	460	459
V/C Ratio(X)	0.66	0.95	0.95	0.89	0.54	0.54	0.66	0.58	0.59	0.24	0.66	0.66
Avail Cap(c_a), veh/h	222	496	488	317	660	682	172	463	447	170	460	459
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	28.5	28.5	32.2	20.1	20.1	37.5	32.5	32.6	33.6	26.7	26.7
Incr Delay (d2), s/veh	4.7	28.2	28.6	24.8	0.9	0.9	9.0	5.1	5.5	0.7	7.2	7.3
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	2.3	14.1	13.9	8.2	6.4	6.6	2.9	6.4	6.3	0.9	6.9	6.9
LnGrp Delay(d),s/veh	40.2	56.7	57.0	57.0	21.0	21.0	46.4	37.6	38.0	34.3	33.8	34.0
LnGrp LOS	D	E	E	E	C	C	D	D	D	C	C	C
Approach Vol, veh/h	1035				1008				646			
Approach Delay, s/veh	55.3				31.0				39.3			
Approach LOS	E				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	11.5	24.5	18.0	26.0	11.6	24.4	10.7	33.3				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	7.0	20.0	13.5	21.5	7.1	19.9	9.3	25.7				
Max Q Clear Time (g_c+I1), s	3.6	13.6	14.1	22.5	7.0	14.1	6.3	14.6				
Green Ext Time (p_c), s	0.1	1.7	0.0	0.0	0.0	1.8	0.1	4.2				
Intersection Summary												
HCM 2010 Ctrl Delay	40.7											
HCM 2010 LOS	D											

HCM 2010 Signalized Intersection Summary

2: Madison Street & Elementary School Exit

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	1	32	1	26	1	619	0	0	862	0
Future Volume (veh/h)	0	0	1	32	1	26	1	619	0	0	862	0
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	1900	1900	1900	1900	1900	1900	1900	1900	0	0	1900	1900
Adj Flow Rate, veh/h	0	0	1	38	1	31	1	728	0	0	1014	0
Adj No. of Lanes	0	1	0	1	0	1	0	2	0	0	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	0	84	102	0	255	45	2628	0	0	2679	0
Arrive On Green	0.00	0.00	0.05	0.06	0.16	0.16	1.00	1.00	0.00	0.00	1.00	0.00
Sat Flow, veh/h	0	0	1615	1810	0	1615	0	3627	0	0	3800	0
Grp Volume(v), veh/h	0	0	1	38	0	31	391	338	0	0	1014	0
Grp Sat Flow(s),veh/h/ln	0	0	1615	1810	0	1615	1899	1643	0	0	1805	0
Q Serve(g_s), s	0.0	0.0	0.0	1.6	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	1.6	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		1.00	1.00		1.00	0.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	0	84	102	0	255	1454	1219	0	0	2679	0
V/C Ratio(X)	0.00	0.00	0.01	0.37	0.00	0.12	0.27	0.28	0.00	0.00	0.38	0.00
Avail Cap(c_a), veh/h	0	0	373	204	0	636	1454	1219	0	0	2679	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	0.65	0.00
Uniform Delay (d), s/veh	0.0	0.0	36.0	36.4	0.0	28.9	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.1	2.3	0.0	0.2	0.5	0.6	0.0	0.0	0.3	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	0.0	0.0	0.0	0.9	0.0	0.6	0.2	0.2	0.0	0.0	0.1	0.0
LnGrp Delay(d),s/veh	0.0	0.0	36.0	38.7	0.0	29.1	0.5	0.6	0.0	0.0	0.3	0.0
LnGrp LOS			D	D		C	A	A			A	
Approach Vol, veh/h		1			69			729			1014	
Approach Delay, s/veh		36.0			34.4			0.5			0.3	
Approach LOS		D			C			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6		8				
Phs Duration (G+Y+Rc), s		63.4	8.5	8.1		63.4		16.6				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5		4.5				
Max Green Setting (Gmax), s		40.0	8.5	18.0		40.0		31.0				
Max Q Clear Time (g_c+I1), s		2.0	3.6	2.0		2.0		3.3				
Green Ext Time (p_c), s		17.0	0.0	0.0		17.0		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			1.7									
HCM 2010 LOS			A									

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	8	10	68	0	0	0	83	612	15	36	818	40
Future Vol, veh/h	8	10	68	0	0	0	83	612	15	36	818	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	4	11	76	0	0	0	92	680	17	40	909	44
Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	1535	1892	477				953	0	0	697	0	0
Stage 1	1011	1011	-				-	-	-	-	-	-
Stage 2	524	881	-				-	-	-	-	-	-
Critical Hdwy	6.8	6.5	6.9				4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.8	5.5	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.8	5.5	-				-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3				2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	109	71	540				729	-	-	909	-	-
Stage 1	317	320	-				-	-	-	-	-	-
Stage 2	564	367	-				-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	78	0	540				729	-	-	909	-	-
Mov Cap-2 Maneuver	78	0	-				-	-	-	-	-	
Stage 1	287	0	-				-	-	-	-	-	-
Stage 2	447	0	-				-	-	-	-	-	-
Approach	EB						NB			SB		
HCM Control Delay, s	16.4						1.2			0.4		
HCM LOS	C											
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR					
Capacity (veh/h)	729	-	-	406	909	-	-					
HCM Lane V/C Ratio	0.127	-	-	0.224	0.044	-	-					
HCM Control Delay (s)	10.7	-	-	16.4	9.1	-	-					
HCM Lane LOS	B	-	-	C	A	-	-					
HCM 95th %tile Q(veh)	0.4	-	-	0.8	0.1	-	-					

HCM 2010 Signalized Intersection Summary 4: Madison Street & Proj DWY 1/Garden Street

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Volume (veh/h)	78	6	122	140	9	61	165	595	48	86	759	77
Future Volume (veh/h)	78	6	122	140	9	61	165	595	48	86	759	77
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	87	7	136	156	10	68	183	661	53	96	843	86
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	178	34	217	262	23	86	334	1354	108	402	1447	148
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.18	0.40	0.40	0.44	0.88	0.88
Sat Flow, veh/h	508	150	952	822	102	379	1810	3386	271	1810	3308	337
Grp Volume(v), veh/h	230	0	0	234	0	0	183	352	362	96	460	469
Grp Sat Flow(s),veh/h/ln	1611	0	0	1303	0	0	1810	1805	1852	1810	1805	1840
Q Serve(g_s), s	0.0	0.0	0.0	3.8	0.0	0.0	7.3	11.6	11.7	2.6	5.2	5.2
Cycle Q Clear(g_c), s	10.0	0.0	0.0	13.8	0.0	0.0	7.3	11.6	11.7	2.6	5.2	5.2
Prop In Lane	0.38		0.59	0.67		0.29	1.00		0.15	1.00		0.18
Lane Grp Cap(c), veh/h	429	0	0	372	0	0	334	722	741	402	790	805
V/C Ratio(X)	0.54	0.00	0.00	0.63	0.00	0.00	0.55	0.49	0.49	0.24	0.58	0.58
Avail Cap(c_a), veh/h	557	0	0	488	0	0	334	722	741	402	790	805
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.6	0.0	0.0	29.2	0.0	0.0	29.6	17.9	17.9	18.0	3.1	3.1
Incr Delay (d2), s/veh	1.0	0.0	0.0	1.8	0.0	0.0	1.9	2.3	2.3	0.3	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	4.7	0.0	0.0	5.1	0.0	0.0	3.8	6.2	6.4	1.3	3.0	3.0
LnGrp Delay(d),s/veh	28.7	0.0	0.0	30.9	0.0	0.0	31.5	20.2	20.2	18.3	6.3	6.2
LnGrp LOS	C			C			C	C	C	B	A	A
Approach Vol, veh/h		230			234			897			1025	
Approach Delay, s/veh		28.7			30.9			22.5			7.4	
Approach LOS		C			C			C			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	21.8	36.0		22.2	18.8	39.0		22.2				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	10.5	31.5		24.5	7.5	34.5		24.5				
Max Q Clear Time (g_c+I1), s	4.6	13.7		12.0	9.3	7.2		15.8				
Green Ext Time (p_c), s	0.4	4.2		2.4	0.0	6.8		1.9				
Intersection Summary												
HCM 2010 Ctrl Delay				17.4								
HCM 2010 LOS				B								

HCM 2010 TWSC
5: Madison Street & Proj DWY 2

7/20/2016

Intersection												
Int Delay, s/veh	12.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕		↙	↕	
Traffic Vol, veh/h	44	0	99	17	1	32	96	732	48	23	919	79
Future Vol, veh/h	44	0	99	17	1	32	96	732	48	23	919	79
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	60	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	46	0	104	18	1	34	101	771	51	24	967	83
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1645	2080	525	1530	2097	411	1051	0	0	821	0	0
Stage 1	1057	1057	-	998	998	-	-	-	-	-	-	-
Stage 2	588	1023	-	532	1099	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	67	54	502	82	53	596	670	-	-	817	-	-
Stage 1	244	304	-	265	324	-	-	-	-	-	-	-
Stage 2	467	316	-	504	291	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	54	45	502	56	44	596	670	-	-	817	-	-
Mov Cap-2 Maneuver	54	45	-	56	44	-	-	-	-	-	-	-
Stage 1	207	295	-	225	275	-	-	-	-	-	-	-
Stage 2	373	268	-	388	282	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	157.5			49.3			1.2			0.2		
HCM LOS	F			E								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	670	-	-	141	132	817	-	-				
HCM Lane V/C Ratio	0.151	-	-	1.068	0.399	0.03	-	-				
HCM Control Delay (s)	11.3	-	-	157.5	49.3	9.5	-	-				
HCM Lane LOS	B	-	-	F	E	A	-	-				
HCM 95th %tile Q(veh)	0.5	-	-	8.1	1.7	0.1	-	-				

HCM 2010 TWSC
6: Madison Street & Gas Stn Access

7/20/2016

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	27	0	874	1029	6
Future Vol, veh/h	0	27	0	874	1029	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	30	0	960	1131	7
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	569	1137	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	5.3	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	3.1	-	-	-
Pot Cap-1 Maneuver	0	403	341	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	403	341	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.6	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	341	-	403	-	-	
HCM Lane V/C Ratio	-	-	0.074	-	-	
HCM Control Delay (s)	0	-	14.6	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.2	-	-	

HCM 2010 Signalized Intersection Summary

7: Madison Street & SR_91 WB

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰	↱	↰	↱			↱	↰
Traffic Volume (veh/h)	0	0	0	212	1	225	265	650	0	0	755	301
Future Volume (veh/h)	0	0	0	212	1	225	265	650	0	0	755	301
Number				3	8	18	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	1900	1900	1900	1900	0	0	1900	1900
Adj Flow Rate, veh/h				214	1	227	268	657	0	0	763	304
Adj No. of Lanes				0	1	1	1	2	0	0	3	1
Peak Hour Factor				0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				326	2	293	690	2595	0	0	1491	464
Arrive On Green				0.18	0.18	0.18	0.76	1.00	0.00	0.00	0.38	0.38
Sat Flow, veh/h				1802	8	1615	1810	3705	0	0	5358	1615
Grp Volume(v), veh/h				215	0	227	268	657	0	0	763	304
Grp Sat Flow(s),veh/h/ln				1810	0	1615	1810	1805	0	0	1729	1615
Q Serve(g_s), s				8.8	0.0	10.7	4.0	0.0	0.0	0.0	9.0	12.4
Cycle Q Clear(g_c), s				8.8	0.0	10.7	4.0	0.0	0.0	0.0	9.0	12.4
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				328	0	293	690	2595	0	0	1491	464
V/C Ratio(X)				0.66	0.00	0.78	0.39	0.25	0.00	0.00	0.51	0.65
Avail Cap(c_a), veh/h				475	0	424	690	2595	0	0	1491	464
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.33	1.33
Upstream Filter(I)				1.00	0.00	1.00	0.94	0.94	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				30.4	0.0	31.2	6.4	0.0	0.0	0.0	20.4	21.4
Incr Delay (d2), s/veh				2.2	0.0	5.5	0.3	0.2	0.0	0.0	1.3	7.0
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				4.6	0.0	5.2	2.0	0.1	0.0	0.0	4.4	6.4
LnGrp Delay(d),s/veh				32.7	0.0	36.7	6.7	0.2	0.0	0.0	21.7	28.5
LnGrp LOS				C		D	A	A			C	C
Approach Vol, veh/h					442			925			1067	
Approach Delay, s/veh					34.7			2.1			23.6	
Approach LOS					C			A			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		61.5			34.5	27.0		18.5				
Change Period (Y+Rc), s		4.5			4.5	4.5		4.5				
Max Green Setting (Gmax), s		50.5			23.5	22.5		20.5				
Max Q Clear Time (g_c+I1), s		2.0			6.0	14.4		12.7				
Green Ext Time (p_c), s		6.2			5.1	3.9		1.3				
Intersection Summary												
HCM 2010 Ctrl Delay				17.4								
HCM 2010 LOS				B								

HCM 2010 Signalized Intersection Summary

8: Madison Street & SR_91 EB

7/20/2016

	           											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  			 	
Traffic Volume (veh/h)	166	3	147	0	0	0	0	748	404	240	727	0
Future Volume (veh/h)	166	3	147	0	0	0	0	748	404	240	727	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	1900	1900				0	1900	1900	1900	1900	0
Adj Flow Rate, veh/h	173	3	153				0	779	421	250	757	0
Adj No. of Lanes	1	0	1				0	3	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	239	0	213				0	2872	894	297	2772	0
Arrive On Green	0.13	0.13	0.13				0.00	0.18	0.18	0.33	1.00	0.00
Sat Flow, veh/h	1810	0	1615				0	5358	1615	1810	3705	0
Grp Volume(v), veh/h	173	0	153				0	779	421	250	757	0
Grp Sat Flow(s),veh/h/ln	1810	0	1615				0	1729	1615	1810	1805	0
Q Serve(g_s), s	7.3	0.0	7.3				0.0	10.3	18.6	10.3	0.0	0.0
Cycle Q Clear(g_c), s	7.3	0.0	7.3				0.0	10.3	18.6	10.3	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	239	0	213				0	2872	894	297	2772	0
V/C Ratio(X)	0.72	0.00	0.72				0.00	0.27	0.47	0.84	0.27	0.00
Avail Cap(c_a), veh/h	452	0	404				0	2872	894	452	2772	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	0.33	0.33	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.60	0.60	0.92	0.92	0.00
Uniform Delay (d), s/veh	33.3	0.0	33.3				0.0	18.8	22.2	25.9	0.0	0.0
Incr Delay (d2), s/veh	4.1	0.0	4.5				0.0	0.1	1.1	7.9	0.2	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	8.9	0.0	3.5				0.0	5.0	8.6	5.7	0.1	0.0
LnGrp Delay(d),s/veh	37.4	0.0	37.7				0.0	19.0	23.3	33.8	0.2	0.0
LnGrp LOS	D		D					B	C	C	A	
Approach Vol, veh/h		326						1200			1007	
Approach Delay, s/veh		37.6						20.5			8.6	
Approach LOS		D						C			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	7.1	48.3		14.6		65.4						
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5						
Max Green Setting (Gmax), s	19.5	27.5		19.5		51.5						
Max Q Clear Time (g_c+1.2), s	12.3	20.6		9.3		2.0						
Green Ext Time (p_c), s	0.4	5.4		0.7		19.8						
Intersection Summary												
HCM 2010 Ctrl Delay			17.9									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary

9: Madison Street & Indiana Ave

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	289	562	87	60	236	334	60	527	41	235	540	100
Future Volume (veh/h)	289	562	87	60	236	334	60	527	41	235	540	100
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	304	592	92	63	248	352	63	555	43	247	568	105
Adj No. of Lanes	1	2	0	1	2	0	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, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	317	1047	162	131	417	373	170	828	64	271	913	168
Arrive On Green	0.17	0.33	0.33	0.07	0.23	0.23	0.09	0.24	0.24	0.15	0.30	0.30
Sat Flow, veh/h	1810	3133	486	1810	1805	1615	1810	3396	263	1810	3045	561
Grp Volume(v), veh/h	304	340	344	63	248	352	63	294	304	247	336	337
Grp Sat Flow(s),veh/h/ln	1810	1805	1814	1810	1805	1615	1810	1805	1854	1810	1805	1801
Q Serve(g_s), s	13.3	12.4	12.4	2.7	9.8	17.1	2.6	11.8	11.8	10.7	12.8	12.9
Cycle Q Clear(g_c), s	13.3	12.4	12.4	2.7	9.8	17.1	2.6	11.8	11.8	10.7	12.8	12.9
Prop In Lane	1.00		0.27	1.00		1.00	1.00		0.14	1.00		0.31
Lane Grp Cap(c), veh/h	317	603	606	131	417	373	170	440	452	271	542	540
V/C Ratio(X)	0.96	0.56	0.57	0.48	0.59	0.94	0.37	0.67	0.67	0.91	0.62	0.62
Avail Cap(c_a), veh/h	317	603	606	170	417	373	170	440	452	271	542	540
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	0.96	0.96	0.96
Uniform Delay (d), s/veh	32.7	21.9	21.9	35.7	27.4	30.2	34.0	27.3	27.4	33.5	24.1	24.1
Incr Delay (d2), s/veh	39.8	1.2	1.2	2.7	2.3	32.1	1.3	7.9	7.7	31.3	5.1	5.2
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	10.2	6.4	6.4	1.4	5.2	11.0	1.4	6.9	7.0	7.7	7.1	7.1
LnGrp Delay(d),s/veh	72.5	23.1	23.1	38.4	29.7	62.3	35.4	35.2	35.1	64.7	29.2	29.3
LnGrp LOS	E	C	C	D	C	E	D	D	D	E	C	C
Approach Vol, veh/h	988			663			661			920		
Approach Delay, s/veh	38.3			47.8			35.2			38.7		
Approach LOS	D			D			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	16.0	23.5	9.8	30.7	11.5	28.0	18.0	22.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	11.5	19.0	7.0	24.5	7.0	23.5	13.5	18.0				
Max Q Clear Time (g_c+1.2), s	12.7	13.8	4.7	14.4	4.6	14.9	15.3	19.1				
Green Ext Time (p_c), s	0.0	1.8	0.0	5.6	0.9	2.7	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	39.7											
HCM 2010 LOS	D											

HCM 2010 TWSC
10: Madison Street & Evans Street

7/20/2016

Intersection												
Int Delay, s/veh	5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↗		↙	↗	
Traffic Vol, veh/h	50	5	31	4	3	59	27	461	15	77	537	44
Future Vol, veh/h	50	5	31	4	3	59	27	461	15	77	537	44
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	80	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	52	5	32	4	3	61	28	480	16	80	559	46
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1320	1295	582	1305	1310	488	605	0	0	496	0	0
Stage 1	743	743	-	544	544	-	-	-	-	-	-	-
Stage 2	577	552	-	761	766	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	135	164	517	138	160	584	983	-	-	1078	-	-
Stage 1	410	425	-	527	522	-	-	-	-	-	-	-
Stage 2	506	518	-	401	415	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	110	148	517	116	144	584	983	-	-	1078	-	-
Mov Cap-2 Maneuver	110	148	-	116	144	-	-	-	-	-	-	-
Stage 1	398	393	-	512	507	-	-	-	-	-	-	-
Stage 2	437	503	-	343	384	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	54.7			15.2			0.5			1		
HCM LOS	F			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	983	-	-	157	422	1078	-	-				
HCM Lane V/C Ratio	0.029	-	-	0.571	0.163	0.074	-	-				
HCM Control Delay (s)	8.8	-	-	54.7	15.2	8.6	-	-				
HCM Lane LOS	A	-	-	F	C	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	3	0.6	0.2	-	-				

HCM 2010 Signalized Intersection Summary

1: Madison Street & Magnolia Ave

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	149	824	138	138	475	54	121	427	146	48	453	175
Future Volume (veh/h)	149	824	138	138	475	54	121	427	146	48	453	175
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	182	1005	168	168	579	66	148	521	178	59	552	213
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	230	1022	171	204	1030	117	181	698	237	170	657	253
Arrive On Green	0.13	0.33	0.33	0.11	0.32	0.32	0.20	0.53	0.53	0.09	0.26	0.26
Sat Flow, veh/h	1810	3097	517	1810	3268	372	1810	2646	900	1810	2551	981
Grp Volume(v), veh/h	182	585	588	168	319	326	148	355	344	59	390	375
Grp Sat Flow(s),veh/h/ln	1810	1805	1809	1810	1805	1834	1810	1805	1741	1810	1805	1727
Q Serve(g_s), s	7.8	25.7	25.8	7.3	11.8	11.8	6.3	12.2	12.4	2.4	16.4	16.5
Cycle Q Clear(g_c), s	7.8	25.7	25.8	7.3	11.8	11.8	6.3	12.2	12.4	2.4	16.4	16.5
Prop In Lane	1.00		0.29	1.00		0.20	1.00		0.52	1.00		0.57
Lane Grp Cap(c), veh/h	230	596	597	204	569	578	181	476	459	170	465	445
V/C Ratio(X)	0.79	0.98	0.98	0.83	0.56	0.56	0.82	0.74	0.75	0.35	0.84	0.84
Avail Cap(c_a), veh/h	258	596	597	204	569	578	181	476	459	170	465	445
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.9	26.6	26.6	34.7	22.8	22.8	31.3	16.8	16.8	34.0	28.1	28.2
Incr Delay (d2), s/veh	13.8	32.4	32.8	23.4	1.3	1.3	24.1	9.9	10.5	1.2	16.5	17.4
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	4.8	18.0	18.2	5.0	6.1	6.2	4.3	7.2	7.1	1.3	10.3	10.0
LnGrp Delay(d),s/veh	47.7	58.9	59.4	58.1	24.0	24.1	55.4	26.7	27.3	35.2	44.6	45.6
LnGrp LOS	D	E	E	E	C	C	E	C	C	D	D	D
Approach Vol, veh/h	1355				813				847			
Approach Delay, s/veh	57.6				31.1				32.0			
Approach LOS	E				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	11.5	25.1	13.0	30.4	12.0	24.6	14.2	29.2				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	7.0	20.6	8.5	25.9	7.5	20.1	10.9	23.5				
Max Q Clear Time (g_c+I1), s	4.4	14.4	9.3	27.8	8.3	18.5	9.8	13.8				
Green Ext Time (p_c), s	1.3	2.3	0.0	0.0	0.0	0.8	0.1	7.1				
Intersection Summary												
HCM 2010 Ctrl Delay	43.5											
HCM 2010 LOS	D											

HCM 2010 Signalized Intersection Summary

2: Madison Street & Elementary School Exit

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	121	0	83	0	575	0	0	720	0
Future Volume (veh/h)	0	0	0	121	0	83	0	575	0	0	720	0
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	1900	1900	1900	1900	0	1900	0	1900	0	0	1900	1900
Adj Flow Rate, veh/h	0	0	0	142	0	98	0	676	0	0	847	0
Adj No. of Lanes	0	1	0	1	0	1	0	2	0	0	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	2	0	191	0	0	0	2868	0	0	2868	0
Arrive On Green	0.00	0.00	0.00	0.11	0.00	0.01	0.00	1.00	0.00	0.00	1.00	0.00
Sat Flow, veh/h	0-76000		0	1810	142		0	3800	0	0	3800	0
Grp Volume(v), veh/h	0	0	0	142	40.4		0	676	0	0	847	0
Grp Sat Flow(s),veh/h/ln	0	1900	0	1810	D		0	1805	0	0	1805	0
Q Serve(g_s), s	0.0	0.0	0.0	6.1			0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	6.1			0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		0.00	1.00			0.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	2	0	191			0	2868	0	0	2868	0
V/C Ratio(X)	0.00	0.00	0.00	0.74			0.00	0.24	0.00	0.00	0.30	0.00
Avail Cap(c_a), veh/h	0	439	0	362			0	2868	0	0	2868	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	2.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	0.00	0.00	0.00	1.00			0.00	1.00	0.00	0.00	0.47	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	34.7			0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	5.7			0.0	0.2	0.0	0.0	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	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	3.3			0.0	0.1	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	40.4			0.0	0.2	0.0	0.0	0.1	0.0
LnGrp LOS				D				A			A	
Approach Vol, veh/h		0						676			847	
Approach Delay, s/veh		0.0						0.2			0.1	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6						
Phs Duration (G+Y+Rc), s		67.6	12.4	0.0		67.6						
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5						
Max Green Setting (Gmax), s		33.0	15.5	18.0		33.0						
Max Q Clear Time (g_c+l1), s		2.0	8.1	0.0		2.0						
Green Ext Time (p_c), s		13.6	0.2	0.0		13.6						
Intersection Summary												
HCM 2010 Ctrl Delay			3.6									
HCM 2010 LOS			A									

Intersection													
Int Delay, s/veh	2.7												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕						↕↕				↕↕	
Traffic Vol, veh/h	11	23	114	0	0	0	60	565	91	124	641	78	
Future Vol, veh/h	11	23	114	0	0	0	60	565	91	124	641	78	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85	
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0	
Mvmt Flow	6	27	134	0	0	0	71	665	107	146	754	92	
Major/Minor	Minor2						Major1			Major2			
Conflicting Flow All	1566	2005	423				846	0	0	772	0	0	
Stage 1	1092	1092	-				-	-	-	-	-	-	
Stage 2	474	913	-				-	-	-	-	-	-	
Critical Hdwy	6.8	6.5	6.9				4.1	-	-	4.1	-	-	
Critical Hdwy Stg 1	5.8	5.5	-				-	-	-	-	-	-	
Critical Hdwy Stg 2	5.8	5.5	-				-	-	-	-	-	-	
Follow-up Hdwy	3.5	4	3.3				2.2	-	-	2.2	-	-	
Pot Cap-1 Maneuver	104	60	585				800	-	-	852	-	-	
Stage 1	287	293	-				-	-	-	-	-	-	
Stage 2	598	355	-				-	-	-	-	-	-	
Platoon blocked, %								-	-		-	-	
Mov Cap-1 Maneuver	59	0	585				800	-	-	852	-	-	
Mov Cap-2 Maneuver	59	0	-				-	-	-	-	-	-	
Stage 1	192	0	-				-	-	-	-	-	-	
Stage 2	503	0	-				-	-	-	-	-	-	
Approach	EB						NB			SB			
HCM Control Delay, s	19.4						0.8			1.5			
HCM LOS	C												
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR						
Capacity (veh/h)	800	-	-	415	852	-	-						
HCM Lane V/C Ratio	0.088	-	-	0.404	0.171	-	-						
HCM Control Delay (s)	9.9	-	-	19.4	10.1	-	-						
HCM Lane LOS	A	-	-	C	B	-	-						
HCM 95th %tile Q(veh)	0.3	-	-	1.9	0.6	-	-						

HCM 2010 Signalized Intersection Summary

4: Madison Street & Proj DWY 1/Garden Street

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	1	7	67	0	62	15	624	44	44	712	18
Future Volume (veh/h)	12	1	7	67	0	62	15	624	44	44	712	18
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	13	1	8	75	0	70	17	701	49	49	800	20
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	172	27	73	159	11	94	61	1498	105	516	2479	62
Arrive On Green	0.13	0.13	0.13	0.13	0.00	0.13	0.07	0.88	0.88	0.57	1.00	1.00
Sat Flow, veh/h	787	213	572	709	85	741	1810	3424	239	1810	3599	90
Grp Volume(v), veh/h	22	0	0	145	0	0	17	369	381	49	401	419
Grp Sat Flow(s),veh/h/ln	1572	0	0	1535	0	0	1810	1805	1858	1810	1805	1884
Q Serve(g_s), s	0.0	0.0	0.0	6.3	0.0	0.0	0.7	3.5	3.5	1.0	0.0	0.0
Cycle Q Clear(g_c), s	0.9	0.0	0.0	7.2	0.0	0.0	0.7	3.5	3.5	1.0	0.0	0.0
Prop In Lane	0.59		0.36	0.52		0.48	1.00		0.13	1.00		0.05
Lane Grp Cap(c), veh/h	272	0	0	264	0	0	61	790	813	516	1243	1298
V/C Ratio(X)	0.08	0.00	0.00	0.55	0.00	0.00	0.28	0.47	0.47	0.09	0.32	0.32
Avail Cap(c_a), veh/h	505	0	0	506	0	0	204	790	813	516	1243	1298
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.8	0.0	0.0	33.6	0.0	0.0	36.4	3.0	3.0	12.5	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	1.8	0.0	0.0	2.4	2.0	1.9	0.1	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	3.2	0.0	0.0	0.4	1.9	1.9	0.5	0.2	0.2
LnGrp Delay(d),s/veh	31.0	0.0	0.0	35.3	0.0	0.0	38.8	5.0	5.0	12.6	0.7	0.7
LnGrp LOS	C			D			D	A	A	B	A	A
Approach Vol, veh/h		22			145			767			869	
Approach Delay, s/veh		31.0			35.3			5.7			1.3	
Approach LOS		C			D			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	26.8	39.0		14.2	6.7	59.1		14.2				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	9.5	34.5		22.5	8.5	35.5		22.5				
Max Q Clear Time (g_c+I1), s	3.0	5.5		2.9	2.7	2.0		9.2				
Green Ext Time (p_c), s	1.5	5.2		0.9	0.0	6.1		0.7				
Intersection Summary												
HCM 2010 Ctrl Delay			6.3									
HCM 2010 LOS			A									

Intersection												
Int Delay, s/veh		0.7										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	0	19	6	0	4	41	677	21	8	765	13
Future Vol, veh/h	2	0	19	6	0	4	41	677	21	8	765	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	60	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	0	21	7	0	4	46	752	23	9	850	14
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1342	1742	432	1298	1737	388	864	0	0	776	0	0
Stage 1	875	875	-	855	855	-	-	-	-	-	-	-
Stage 2	467	867	-	443	882	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	112	88	577	121	88	616	787	-	-	849	-	-
Stage 1	315	370	-	323	378	-	-	-	-	-	-	-
Stage 2	551	373	-	569	367	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	105	82	577	110	82	616	787	-	-	849	-	-
Mov Cap-2 Maneuver	105	82	-	110	82	-	-	-	-	-	-	-
Stage 1	297	366	-	304	356	-	-	-	-	-	-	-
Stage 2	515	351	-	542	363	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	14.5			28.5			0.5			0.1		
HCM LOS	B			D								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	787	-	-	404	164	849	-	-				
HCM Lane V/C Ratio	0.058	-	-	0.058	0.068	0.01	-	-				
HCM Control Delay (s)	9.9	-	-	14.5	28.5	9.3	-	-				
HCM Lane LOS	A	-	-	B	D	A	-	-				
HCM 95th %tile Q(veh)	0.2	-	-	0.2	0.2	0	-	-				

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	33	0	739	789	1
Future Vol, veh/h	0	33	0	739	789	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	36	0	812	867	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	434	868	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	5.3	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	3.1	-	-	-
Pot Cap-1 Maneuver	0	492	459	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	492	459	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.9	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	459	-	492	-	-	
HCM Lane V/C Ratio	-	-	0.074	-	-	
HCM Control Delay (s)	0	-	12.9	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.2	-	-	

HCM 2010 Signalized Intersection Summary

7: Madison Street & SR_91 WB

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰	↱	↰	↱			↱	↰
Traffic Volume (veh/h)	0	0	0	318	4	228	304	511	0	0	533	289
Future Volume (veh/h)	0	0	0	318	4	228	304	511	0	0	533	289
Number				3	8	18	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	1900	1900	1900	1900	0	0	1900	1900
Adj Flow Rate, veh/h				342	4	245	327	549	0	0	573	311
Adj No. of Lanes				0	1	1	1	2	0	0	3	1
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				422	5	381	668	2397	0	0	1271	396
Arrive On Green				0.24	0.24	0.24	0.74	1.00	0.00	0.00	0.08	0.08
Sat Flow, veh/h				1790	21	1615	1810	3705	0	0	5358	1615
Grp Volume(v), veh/h				346	0	245	327	549	0	0	573	311
Grp Sat Flow(s),veh/h/ln				1811	0	1615	1810	1805	0	0	1729	1615
Q Serve(g_s), s				14.4	0.0	10.9	5.9	0.0	0.0	0.0	8.4	15.1
Cycle Q Clear(g_c), s				14.4	0.0	10.9	5.9	0.0	0.0	0.0	8.4	15.1
Prop In Lane				0.99		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				427	0	381	668	2397	0	0	1271	396
V/C Ratio(X)				0.81	0.00	0.64	0.49	0.23	0.00	0.00	0.45	0.79
Avail Cap(c_a), veh/h				566	0	505	668	2397	0	0	1271	396
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	0.33	0.33
Upstream Filter(I)				1.00	0.00	1.00	0.96	0.96	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				28.9	0.0	27.5	7.4	0.0	0.0	0.0	31.6	34.7
Incr Delay (d2), s/veh				6.5	0.0	1.8	0.5	0.2	0.0	0.0	1.2	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				8.0	0.0	5.0	2.8	0.1	0.0	0.0	4.2	8.4
LnGrp Delay(d),s/veh				35.4	0.0	29.3	7.9	0.2	0.0	0.0	32.8	49.2
LnGrp LOS				D		C	A	A			C	D
Approach Vol, veh/h					591			876			884	
Approach Delay, s/veh					32.9			3.1			38.6	
Approach LOS					C			A			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		57.1			33.5	23.6		22.9				
Change Period (Y+Rc), s		4.5			4.5	4.5		4.5				
Max Green Setting (Gmax), s		46.5			22.9	19.1		24.5				
Max Q Clear Time (g_c+I1), s		2.0			7.9	17.1		16.4				
Green Ext Time (p_c), s		5.4			4.2	1.0		1.9				
Intersection Summary												
HCM 2010 Ctrl Delay				23.9								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary

8: Madison Street & SR_91 EB

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	88	22	80	0	0	0	0	727	376	245	607	0
Future Volume (veh/h)	88	22	80	0	0	0	0	727	376	245	607	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	1900	1900				0	1900	1900	1900	1900	0
Adj Flow Rate, veh/h	94	23	85				0	773	400	261	646	0
Adj No. of Lanes	1	0	1				0	3	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	168	0	150				0	3043	947	309	2914	0
Arrive On Green	0.09	0.09	0.09				0.00	0.19	0.19	0.34	1.00	0.00
Sat Flow, veh/h	1810	0	1615				0	5358	1615	1810	3705	0
Grp Volume(v), veh/h	94	0	85				0	773	400	261	646	0
Grp Sat Flow(s),veh/h/ln	1810	0	1615				0	1729	1615	1810	1805	0
Q Serve(g_s), s	4.0	0.0	4.0				0.0	10.1	17.4	10.7	0.0	0.0
Cycle Q Clear(g_c), s	4.0	0.0	4.0				0.0	10.1	17.4	10.7	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	168	0	150				0	3043	947	309	2914	0
V/C Ratio(X)	0.56	0.00	0.57				0.00	0.25	0.42	0.85	0.22	0.00
Avail Cap(c_a), veh/h	430	0	384				0	3043	947	498	2914	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	0.33	0.33	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.71	0.71	0.94	0.94	0.00
Uniform Delay (d), s/veh	34.7	0.0	34.8				0.0	17.4	20.3	25.4	0.0	0.0
Incr Delay (d2), s/veh	2.9	0.0	3.3				0.0	0.1	1.0	6.9	0.2	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	2.1	0.0	1.9				0.0	4.9	8.1	5.8	0.1	0.0
LnGrp Delay(d),s/veh	37.6	0.0	38.1				0.0	17.6	21.3	32.3	0.2	0.0
LnGrp LOS	D		D					B	C	C	A	
Approach Vol, veh/h		179						1173			907	
Approach Delay, s/veh		37.9						18.8			9.4	
Approach LOS		D						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	17.6	50.9		11.4		68.6						
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5						
Max Green Setting (Gmax), s	21.5	26.5		18.5		52.5						
Max Q Clear Time (g_c+1/2), s	12.7	19.4		6.0		2.0						
Green Ext Time (p_c), s	0.5	5.3		0.4		17.6						
Intersection Summary												
HCM 2010 Ctrl Delay			16.6									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary

9: Madison Street & Indiana Ave

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	216	782	37	22	160	307	36	582	40	221	295	170
Future Volume (veh/h)	216	782	37	22	160	307	36	582	40	221	295	170
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	235	850	40	24	174	334	39	633	43	240	321	185
Adj No. of Lanes	1	2	0	1	2	0	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, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	284	1214	57	77	417	373	180	875	59	284	696	392
Arrive On Green	0.16	0.35	0.35	0.04	0.23	0.23	0.10	0.26	0.26	0.26	0.52	0.52
Sat Flow, veh/h	1810	3511	165	1810	1805	1615	1810	3431	233	1810	2228	1256
Grp Volume(v), veh/h	235	437	453	24	174	334	39	333	343	240	259	247
Grp Sat Flow(s),veh/h/ln	1810	1805	1871	1810	1805	1615	1810	1805	1859	1810	1805	1678
Q Serve(g_s), s	10.1	16.7	16.7	1.0	6.6	16.0	1.6	13.5	13.5	10.1	7.2	7.5
Cycle Q Clear(g_c), s	10.1	16.7	16.7	1.0	6.6	16.0	1.6	13.5	13.5	10.1	7.2	7.5
Prop In Lane	1.00		0.09	1.00		1.00	1.00		0.13	1.00		0.75
Lane Grp Cap(c), veh/h	284	624	647	77	417	373	180	460	474	284	564	524
V/C Ratio(X)	0.83	0.70	0.70	0.31	0.42	0.89	0.22	0.72	0.72	0.85	0.46	0.47
Avail Cap(c_a), veh/h	294	624	647	170	417	373	180	460	474	294	564	524
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98
Uniform Delay (d), s/veh	32.7	22.6	22.6	37.2	26.2	29.8	33.2	27.2	27.2	28.6	14.9	14.9
Incr Delay (d2), s/veh	17.1	3.5	3.4	2.3	0.7	23.0	0.6	9.5	9.3	19.1	2.6	3.0
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	6.4	8.9	9.2	0.6	3.3	9.5	0.8	7.9	8.1	6.5	3.9	3.9
LnGrp Delay(d),s/veh	49.7	26.1	26.0	39.5	26.8	52.8	33.8	36.7	36.5	47.7	17.5	17.9
LnGrp LOS	D	C	C	D	C	D	C	D	D	D	B	B
Approach Vol, veh/h	1125			532			715			746		
Approach Delay, s/veh	31.0			43.7			36.4			27.4		
Approach LOS	C			D			D			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	16.5	24.4	7.4	31.7	11.9	29.0	16.6	22.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	12.5	19.0	7.0	23.5	7.0	24.5	12.5	18.0				
Max Q Clear Time (g_c+1.2), s	12.5	15.5	3.0	18.7	3.6	9.5	12.1	18.0				
Green Ext Time (p_c), s	0.0	1.4	0.0	2.6	1.4	2.7	0.1	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	33.5											
HCM 2010 LOS	C											

HCM 2010 TWSC
10: Madison Street & Evans Street

7/6/2016

Intersection												
Int Delay, s/veh	3.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↗		↙	↗	
Traffic Vol, veh/h	37	9	26	2	9	59	13	570	8	21	265	24
Future Vol, veh/h	37	9	26	2	9	59	13	570	8	21	265	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	80	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	40	10	28	2	10	64	14	620	9	23	288	26
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1036	1004	301	1018	1012	624	314	0	0	628	0	0
Stage 1	347	347	-	652	652	-	-	-	-	-	-	-
Stage 2	689	657	-	366	360	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	212	244	743	218	241	489	1258	-	-	964	-	-
Stage 1	673	638	-	460	467	-	-	-	-	-	-	-
Stage 2	439	465	-	657	630	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	174	236	743	198	233	489	1258	-	-	964	-	-
Mov Cap-2 Maneuver	174	236	-	198	233	-	-	-	-	-	-	-
Stage 1	666	623	-	455	462	-	-	-	-	-	-	-
Stage 2	369	460	-	607	615	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	25.6			15.7			0.2			0.6		
HCM LOS	D			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1258	-	-	252	413	964	-	-				
HCM Lane V/C Ratio	0.011	-	-	0.311	0.184	0.024	-	-				
HCM Control Delay (s)	7.9	-	-	25.6	15.7	8.8	-	-				
HCM Lane LOS	A	-	-	D	C	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	1.3	0.7	0.1	-	-				

HCM 2010 Signalized Intersection Summary

1: Madison Street & Magnolia Ave

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	702	166	253	645	39	97	357	114	38	460	88
Future Volume (veh/h)	94	702	166	253	645	39	97	357	114	38	460	88
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	100	747	177	269	686	41	103	380	121	40	489	94
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	152	797	189	316	1266	76	172	693	218	170	771	147
Arrive On Green	0.08	0.28	0.28	0.17	0.37	0.37	0.03	0.08	0.08	0.09	0.25	0.25
Sat Flow, veh/h	1810	2897	686	1810	3462	207	1810	2704	850	1810	3025	578
Grp Volume(v), veh/h	100	465	459	269	357	370	103	252	249	40	291	292
Grp Sat Flow(s),veh/h/ln	1810	1805	1779	1810	1805	1864	1810	1805	1750	1810	1805	1798
Q Serve(g_s), s	4.3	20.1	20.2	11.5	12.5	12.6	4.5	10.7	10.9	1.6	11.4	11.6
Cycle Q Clear(g_c), s	4.3	20.1	20.2	11.5	12.5	12.6	4.5	10.7	10.9	1.6	11.4	11.6
Prop In Lane	1.00		0.39	1.00		0.11	1.00		0.49	1.00		0.32
Lane Grp Cap(c), veh/h	152	496	489	316	660	681	172	463	448	170	460	458
V/C Ratio(X)	0.66	0.94	0.94	0.85	0.54	0.54	0.60	0.54	0.56	0.24	0.63	0.64
Avail Cap(c_a), veh/h	222	496	489	317	660	681	172	463	448	170	460	458
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	28.3	28.3	32.0	20.1	20.1	37.2	32.1	32.2	33.6	26.5	26.5
Incr Delay (d2), s/veh	4.7	25.7	25.9	19.2	0.9	0.9	5.5	4.5	4.8	0.7	6.5	6.6
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	2.3	13.5	13.3	7.4	6.4	6.6	2.5	5.9	5.9	0.9	6.5	6.5
LnGrp Delay(d),s/veh	40.2	54.0	54.3	51.2	21.0	21.0	42.7	36.6	37.0	34.3	32.9	33.1
LnGrp LOS	D	D	D	D	C	C	D	D	D	C	C	C
Approach Vol, veh/h	1024				996			604			623	
Approach Delay, s/veh	52.8				29.1			37.8			33.1	
Approach LOS	D				C			D			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	11.5	24.5	18.0	26.0	11.6	24.4	10.7	33.3				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	7.0	20.0	13.5	21.5	7.1	19.9	9.3	25.7				
Max Q Clear Time (g_c+I1), s	3.6	12.9	13.5	22.2	6.5	13.6	6.3	14.6				
Green Ext Time (p_c), s	0.1	1.7	0.0	0.0	0.0	1.9	0.1	4.1				
Intersection Summary												
HCM 2010 Ctrl Delay	39.0											
HCM 2010 LOS	D											

HCM 2010 Signalized Intersection Summary

2: Madison Street & Elementary School Exit

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	1	32	1	26	1	571	0	0	806	0
Future Volume (veh/h)	0	0	1	32	1	26	1	571	0	0	806	0
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	1900	1900	1900	1900	1900	1900	1900	1900	0	0	1900	1900
Adj Flow Rate, veh/h	0	0	1	38	1	31	1	672	0	0	948	0
Adj No. of Lanes	0	1	0	1	0	1	0	2	0	0	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	0	84	102	0	255	46	2628	0	0	2679	0
Arrive On Green	0.00	0.00	0.05	0.06	0.16	0.16	1.00	1.00	0.00	0.00	1.00	0.00
Sat Flow, veh/h	0	0	1615	1810	0	1615	1	3627	0	0	3800	0
Grp Volume(v), veh/h	0	0	1	38	0	31	361	312	0	0	948	0
Grp Sat Flow(s),veh/h/ln	0	0	1615	1810	0	1615	1899	1643	0	0	1805	0
Q Serve(g_s), s	0.0	0.0	0.0	1.6	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	1.6	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		1.00	1.00		1.00	0.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	0	84	102	0	255	1454	1219	0	0	2679	0
V/C Ratio(X)	0.00	0.00	0.01	0.37	0.00	0.12	0.25	0.26	0.00	0.00	0.35	0.00
Avail Cap(c_a), veh/h	0	0	373	204	0	636	1454	1219	0	0	2679	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	0.69	0.00
Uniform Delay (d), s/veh	0.0	0.0	36.0	36.4	0.0	28.9	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.1	2.3	0.0	0.2	0.4	0.5	0.0	0.0	0.3	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	0.0	0.0	0.0	0.9	0.0	0.6	0.2	0.2	0.0	0.0	0.1	0.0
LnGrp Delay(d),s/veh	0.0	0.0	36.0	38.7	0.0	29.1	0.4	0.5	0.0	0.0	0.3	0.0
LnGrp LOS			D	D		C	A	A			A	
Approach Vol, veh/h		1			69			673			948	
Approach Delay, s/veh		36.0			34.4			0.5			0.3	
Approach LOS		D			C			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6		8				
Phs Duration (G+Y+Rc), s		63.4	8.5	8.1		63.4		16.6				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5		4.5				
Max Green Setting (Gmax), s		40.0	8.5	18.0		40.0		31.0				
Max Q Clear Time (g_c+I1), s		2.0	3.6	2.0		2.0		3.3				
Green Ext Time (p_c), s		15.3	0.0	0.0		15.3		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			1.7									
HCM 2010 LOS			A									

Intersection

Int Delay, s/veh 1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	8	10	57	0	0	0	73	565	15	36	763	40
Future Vol, veh/h	8	10	57	0	0	0	73	565	15	36	763	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	4	11	63	0	0	0	81	628	17	40	848	44

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1426	1757	446	892	0	0	644	0	0
Stage 1	950	950	-	-	-	-	-	-	-
Stage 2	476	807	-	-	-	-	-	-	-
Critical Hdwy	6.8	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.8	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.8	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	129	86	565	769	-	-	951	-	-
Stage 1	341	341	-	-	-	-	-	-	-
Stage 2	597	397	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	99	0	565	769	-	-	951	-	-
Mov Cap-2 Maneuver	99	0	-	-	-	-	-	-	-
Stage 1	312	0	-	-	-	-	-	-	-
Stage 2	498	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.2	1.1	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR
Capacity (veh/h)	769	-	-	432	951	-	-
HCM Lane V/C Ratio	0.105	-	-	0.183	0.042	-	-
HCM Control Delay (s)	10.2	-	-	15.2	9	-	-
HCM Lane LOS	B	-	-	C	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	0.7	0.1	-	-

HCM 2010 Signalized Intersection Summary

4: Madison Street & Proj DWY 1/Garden Street

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	6	7	144	1	64	38	594	48	86	751	20
Future Volume (veh/h)	19	6	7	144	1	64	38	594	48	86	751	20
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	21	7	8	160	1	71	42	660	53	96	834	22
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	225	77	66	272	4	88	401	1354	109	469	1572	41
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.29	0.53	0.53	0.52	0.88	0.88
Sat Flow, veh/h	808	402	346	1024	22	461	1810	3385	272	1810	3593	95
Grp Volume(v), veh/h	36	0	0	232	0	0	42	352	361	96	419	437
Grp Sat Flow(s),veh/h/ln	1556	0	0	1507	0	0	1810	1805	1852	1810	1805	1883
Q Serve(g_s), s	0.0	0.0	0.0	10.4	0.0	0.0	1.4	9.8	9.9	2.3	4.3	4.3
Cycle Q Clear(g_c), s	1.3	0.0	0.0	11.7	0.0	0.0	1.4	9.8	9.9	2.3	4.3	4.3
Prop In Lane	0.58		0.22	0.69		0.31	1.00		0.15	1.00		0.05
Lane Grp Cap(c), veh/h	368	0	0	364	0	0	401	722	741	469	790	824
V/C Ratio(X)	0.10	0.00	0.00	0.64	0.00	0.00	0.10	0.49	0.49	0.20	0.53	0.53
Avail Cap(c_a), veh/h	549	0	0	543	0	0	401	722	741	469	790	824
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.7	0.0	0.0	30.8	0.0	0.0	22.4	13.5	13.5	14.8	3.1	3.1
Incr Delay (d2), s/veh	0.1	0.0	0.0	1.9	0.0	0.0	0.1	2.3	2.3	0.2	2.5	2.4
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	0.7	0.0	0.0	5.1	0.0	0.0	0.7	5.3	5.4	1.1	2.4	2.5
LnGrp Delay(d),s/veh	26.8	0.0	0.0	32.6	0.0	0.0	22.6	15.9	15.8	15.0	5.6	5.5
LnGrp LOS	C			C			C	B	B	B	A	A
Approach Vol, veh/h		36			232			755			952	
Approach Delay, s/veh		26.8			32.6			16.2			6.5	
Approach LOS		C			C			B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	24.7	36.0		19.3	21.7	39.0		19.3				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	10.5	31.5		24.5	7.5	34.5		24.5				
Max Q Clear Time (g_c+I1), s	4.3	11.9		3.3	3.4	6.3		13.7				
Green Ext Time (p_c), s	0.2	4.4		1.5	0.1	6.1		1.1				
Intersection Summary												
HCM 2010 Ctrl Delay				13.7								
HCM 2010 LOS				B								

HCM 2010 TWSC
5: Madison Street & Proj DWY 2

7/6/2016

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↙↕↗			↙↕↗		
Traffic Vol, veh/h	2	0	36	17	1	32	27	647	48	23	849	31
Future Vol, veh/h	2	0	36	17	1	32	27	647	48	23	849	31
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	60	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	0	38	18	1	34	28	681	51	24	894	33
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1356	1746	463	1258	1738	366	926	0	0	732	0	0
Stage 1	958	958	-	763	763	-	-	-	-	-	-	-
Stage 2	398	788	-	495	975	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	110	87	551	130	88	637	746	-	-	882	-	-
Stage 1	280	338	-	367	416	-	-	-	-	-	-	-
Stage 2	605	405	-	530	332	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	98	81	551	115	82	637	746	-	-	882	-	-
Mov Cap-2 Maneuver	98	81	-	115	82	-	-	-	-	-	-	-
Stage 1	269	329	-	353	400	-	-	-	-	-	-	-
Stage 2	550	390	-	480	323	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	13.9			24.4			0.4			0.2		
HCM LOS	B			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	746	-	-	443	238	882	-	-				
HCM Lane V/C Ratio	0.038	-	-	0.09	0.221	0.027	-	-				
HCM Control Delay (s)	10	-	-	13.9	24.4	9.2	-	-				
HCM Lane LOS	B	-	-	B	C	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.8	0.1	-	-				

HCM 2010 TWSC
6: Madison Street & Gas Stn Access

7/6/2016

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	27	0	721	896	6
Future Vol, veh/h	0	27	0	721	896	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	30	0	792	985	7
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	496	991	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	5.3	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	3.1	-	-	-
Pot Cap-1 Maneuver	0	449	401	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	449	401	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	13.6	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	401	-	449	-	-	
HCM Lane V/C Ratio	-	-	0.066	-	-	
HCM Control Delay (s)	0	-	13.6	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.2	-	-	

HCM 2010 Signalized Intersection Summary

7: Madison Street & SR_91 WB

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	213	1	181	266	541	0	0	660	262
Future Volume (veh/h)	0	0	0	213	1	181	266	541	0	0	660	262
Number				3	8	18	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	1900	1900	1900	1900	0	0	1900	1900
Adj Flow Rate, veh/h				215	1	183	269	546	0	0	667	265
Adj No. of Lanes				0	1	1	1	2	0	0	3	1
Peak Hour Factor				0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				291	1	260	726	2667	0	0	1491	464
Arrive On Green				0.16	0.16	0.16	0.80	1.00	0.00	0.00	0.38	0.38
Sat Flow, veh/h				1802	8	1615	1810	3705	0	0	5358	1615
Grp Volume(v), veh/h				216	0	183	269	546	0	0	667	265
Grp Sat Flow(s),veh/h/ln				1810	0	1615	1810	1805	0	0	1729	1615
Q Serve(g_s), s				9.1	0.0	8.6	3.3	0.0	0.0	0.0	7.7	10.4
Cycle Q Clear(g_c), s				9.1	0.0	8.6	3.3	0.0	0.0	0.0	7.7	10.4
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				292	0	260	726	2667	0	0	1491	464
V/C Ratio(X)				0.74	0.00	0.70	0.37	0.20	0.00	0.00	0.45	0.57
Avail Cap(c_a), veh/h				475	0	424	726	2667	0	0	1491	464
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.33	1.33
Upstream Filter(I)				1.00	0.00	1.00	0.96	0.96	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				32.0	0.0	31.7	5.1	0.0	0.0	0.0	20.0	20.8
Incr Delay (d2), s/veh				3.7	0.0	3.4	0.3	0.2	0.0	0.0	1.0	5.0
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				4.9	0.0	4.1	1.5	0.1	0.0	0.0	3.8	5.3
LnGrp Delay(d),s/veh				35.6	0.0	35.2	5.4	0.2	0.0	0.0	20.9	25.8
LnGrp LOS				D		D	A	A			C	C
Approach Vol, veh/h					399			815			932	
Approach Delay, s/veh					35.4			1.9			22.3	
Approach LOS					D			A			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		63.1			36.1	27.0		16.9				
Change Period (Y+Rc), s		4.5			4.5	4.5		4.5				
Max Green Setting (Gmax), s		50.5			23.5	22.5		20.5				
Max Q Clear Time (g_c+I1), s		2.0			5.3	12.4		11.1				
Green Ext Time (p_c), s		5.1			4.3	4.0		1.3				
Intersection Summary												
HCM 2010 Ctrl Delay				17.0								
HCM 2010 LOS				B								

HCM 2010 Signalized Intersection Summary

8: Madison Street & SR_91 EB

7/6/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	3	149	0	0	0	0	684	405	201	672	0
Future Volume (veh/h)	122	3	149	0	0	0	0	684	405	201	672	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	1900	1900				0	1900	1900	1900	1900	0
Adj Flow Rate, veh/h	127	3	155				0	712	422	209	700	0
Adj No. of Lanes	1	0	1				0	3	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	237	0	212				0	2992	932	257	2776	0
Arrive On Green	0.13	0.13	0.13				0.00	0.19	0.19	0.28	1.00	0.00
Sat Flow, veh/h	1810	0	1615				0	5358	1615	1810	3705	0
Grp Volume(v), veh/h	127	0	155				0	712	422	209	700	0
Grp Sat Flow(s),veh/h/ln	1810	0	1615				0	1729	1615	1810	1805	0
Q Serve(g_s), s	5.2	0.0	7.4				0.0	9.3	18.5	8.6	0.0	0.0
Cycle Q Clear(g_c), s	5.2	0.0	7.4				0.0	9.3	18.5	8.6	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	237	0	212				0	2992	932	257	2776	0
V/C Ratio(X)	0.54	0.00	0.73				0.00	0.24	0.45	0.81	0.25	0.00
Avail Cap(c_a), veh/h	452	0	404				0	2992	932	452	2776	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	0.33	0.33	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.66	0.66	0.94	0.94	0.00
Uniform Delay (d), s/veh	32.5	0.0	33.4				0.0	17.5	21.2	27.6	0.0	0.0
Incr Delay (d2), s/veh	1.9	0.0	4.8				0.0	0.1	1.1	5.8	0.2	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	2.7	0.0	3.6				0.0	4.5	8.6	4.7	0.1	0.0
LnGrp Delay(d),s/veh	34.4	0.0	38.2				0.0	17.6	22.3	33.4	0.2	0.0
LnGrp LOS	C		D					B	C	C	A	
Approach Vol, veh/h		282						1134			909	
Approach Delay, s/veh		36.5						19.3			7.8	
Approach LOS		D						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	15.4	50.1		14.5		65.5						
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5						
Max Green Setting (Gmax), s	19.5	27.5		19.5		51.5						
Max Q Clear Time (g_c+10), s	10.6	20.5		9.4		2.0						
Green Ext Time (p_c), s	0.4	5.3		0.6		17.7						
Intersection Summary												
HCM 2010 Ctrl Delay			16.9									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary

9: Madison Street & Indiana Ave

7/6/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	280	563	87	61	236	325	60	483	42	228	501	92
Future Volume (veh/h)	280	563	87	61	236	325	60	483	42	228	501	92
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	295	593	92	64	248	342	63	508	44	240	527	97
Adj No. of Lanes	1	2	0	1	2	0	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, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	317	1046	162	131	417	373	170	820	71	271	914	168
Arrive On Green	0.17	0.33	0.33	0.07	0.23	0.23	0.09	0.24	0.24	0.15	0.30	0.30
Sat Flow, veh/h	1810	3134	485	1810	1805	1615	1810	3363	291	1810	3048	559
Grp Volume(v), veh/h	295	341	344	64	248	342	63	272	280	240	311	313
Grp Sat Flow(s),veh/h/ln	1810	1805	1814	1810	1805	1615	1810	1805	1849	1810	1805	1801
Q Serve(g_s), s	12.9	12.4	12.5	2.7	9.8	16.5	2.6	10.7	10.8	10.4	11.7	11.8
Cycle Q Clear(g_c), s	12.9	12.4	12.5	2.7	9.8	16.5	2.6	10.7	10.8	10.4	11.7	11.8
Prop In Lane	1.00		0.27	1.00		1.00	1.00		0.16	1.00		0.31
Lane Grp Cap(c), veh/h	317	602	605	131	417	373	170	440	451	271	542	540
V/C Ratio(X)	0.93	0.57	0.57	0.49	0.59	0.92	0.37	0.62	0.62	0.88	0.57	0.58
Avail Cap(c_a), veh/h	317	602	605	170	417	373	170	440	451	271	542	540
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	0.97	0.97	0.97
Uniform Delay (d), s/veh	32.5	21.9	21.9	35.7	27.4	30.0	34.0	26.9	27.0	33.3	23.7	23.7
Incr Delay (d2), s/veh	33.2	1.2	1.3	2.8	2.3	26.7	1.3	6.4	6.3	26.6	4.3	4.3
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	9.3	6.4	6.4	1.5	5.2	10.1	1.4	6.1	6.3	7.2	6.4	6.5
LnGrp Delay(d),s/veh	65.8	23.1	23.2	38.4	29.7	56.7	35.4	33.3	33.3	59.9	27.9	28.0
LnGrp LOS	E	C	C	D	C	E	D	C	C	E	C	C
Approach Vol, veh/h	980			654			615			864		
Approach Delay, s/veh	36.0			44.6			33.5			36.8		
Approach LOS	D			D			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	16.0	23.5	9.8	30.7	11.5	28.0	18.0	22.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	11.5	19.0	7.0	24.5	7.0	23.5	13.5	18.0				
Max Q Clear Time (g_c+1.5), s	12.4	12.8	4.7	14.5	4.6	13.8	14.9	18.5				
Green Ext Time (p_c), s	0.0	1.9	0.0	5.5	0.9	2.7	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	37.6											
HCM 2010 LOS	D											

HCM 2010 TWSC
10: Madison Street & Evans Street

7/6/2016

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	39	5	31	4	3	48	27	452	15	67	528	34
Future Vol, veh/h	39	5	31	4	3	48	27	452	15	67	528	34
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	80	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	41	5	32	4	3	50	28	471	16	70	550	35
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1268	1250	568	1261	1260	479	585	0	0	486	0	0
Stage 1	707	707	-	535	535	-	-	-	-	-	-	-
Stage 2	561	543	-	726	725	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	147	174	526	148	172	591	1000	-	-	1087	-	-
Stage 1	429	441	-	533	527	-	-	-	-	-	-	-
Stage 2	516	523	-	419	433	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	123	158	526	126	156	591	1000	-	-	1087	-	-
Mov Cap-2 Maneuver	123	158	-	126	156	-	-	-	-	-	-	-
Stage 1	417	413	-	518	512	-	-	-	-	-	-	-
Stage 2	456	508	-	363	405	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	38.3			15			0.5			0.9		
HCM LOS	E			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1000	-	-	184	416	1087	-	-				
HCM Lane V/C Ratio	0.028	-	-	0.425	0.138	0.064	-	-				
HCM Control Delay (s)	8.7	-	-	38.3	15	8.5	-	-				
HCM Lane LOS	A	-	-	E	C	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	1.9	0.5	0.2	-	-				

HCM 2010 Signalized Intersection Summary

1: Madison Street & Magnolia Ave

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	149	824	145	145	475	54	126	437	151	48	467	175
Future Volume (veh/h)	149	824	145	145	475	54	126	437	151	48	467	175
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	182	1005	177	177	579	66	154	533	184	59	570	213
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	230	1013	178	204	1030	117	181	696	239	170	663	247
Arrive On Green	0.13	0.33	0.33	0.11	0.32	0.32	0.20	0.53	0.53	0.09	0.26	0.26
Sat Flow, veh/h	1810	3070	540	1810	3268	372	1810	2638	907	1810	2575	960
Grp Volume(v), veh/h	182	590	592	177	319	326	154	364	353	59	399	384
Grp Sat Flow(s),veh/h/ln	1810	1805	1805	1810	1805	1834	1810	1805	1740	1810	1805	1731
Q Serve(g_s), s	7.8	26.1	26.1	7.7	11.8	11.8	6.6	12.8	12.9	2.4	16.9	16.9
Cycle Q Clear(g_c), s	7.8	26.1	26.1	7.7	11.8	11.8	6.6	12.8	12.9	2.4	16.9	16.9
Prop In Lane	1.00		0.30	1.00		0.20	1.00		0.52	1.00		0.55
Lane Grp Cap(c), veh/h	230	596	596	204	569	578	181	476	459	170	465	446
V/C Ratio(X)	0.79	0.99	0.99	0.87	0.56	0.56	0.85	0.76	0.77	0.35	0.86	0.86
Avail Cap(c_a), veh/h	258	596	596	204	569	578	181	476	459	170	465	446
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.97	0.97	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.9	26.7	26.7	34.9	22.8	22.8	31.4	16.9	17.0	34.0	28.3	28.3
Incr Delay (d2), s/veh	13.8	34.5	35.1	30.7	1.3	1.3	29.5	10.9	11.5	1.2	18.3	19.2
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	4.8	18.7	18.8	5.6	6.1	6.2	4.7	7.7	7.5	1.3	10.7	10.5
LnGrp Delay(d),s/veh	47.7	61.2	61.8	65.7	24.0	24.1	60.9	27.8	28.4	35.2	46.6	47.6
LnGrp LOS	D	E	E	E	C	C	E	C	C	D	D	D
Approach Vol, veh/h	1364				822				871			
Approach Delay, s/veh	59.7				33.0				33.9			
Approach LOS	E				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	11.5	25.1	13.0	30.4	12.0	24.6	14.2	29.2				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	7.0	20.6	8.5	25.9	7.5	20.1	10.9	23.5				
Max Q Clear Time (g_c+I1), s	4.4	14.9	9.7	28.1	8.6	18.9	9.8	13.8				
Green Ext Time (p_c), s	1.3	2.2	0.0	0.0	0.0	0.6	0.1	7.2				
Intersection Summary												
HCM 2010 Ctrl Delay	45.4											
HCM 2010 LOS	D											

HCM 2010 Signalized Intersection Summary

2: Madison Street & Elementary School Exit

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	121	0	83	0	600	0	0	754	0
Future Volume (veh/h)	0	0	0	121	0	83	0	600	0	0	754	0
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	1900	1900	1900	1900	0	1900	0	1900	0	0	1900	1900
Adj Flow Rate, veh/h	0	0	0	142	0	98	0	706	0	0	887	0
Adj No. of Lanes	0	1	0	1	0	1	0	2	0	0	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	2	0	191	0	0	0	2868	0	0	2868	0
Arrive On Green	0.00	0.00	0.00	0.11	0.00	0.01	0.00	1.00	0.00	0.00	1.00	0.00
Sat Flow, veh/h	0-76000		0	1810	142		0	3800	0	0	3800	0
Grp Volume(v), veh/h	0	0	0	142	40.4		0	706	0	0	887	0
Grp Sat Flow(s),veh/h/ln	0	1900	0	1810	D		0	1805	0	0	1805	0
Q Serve(g_s), s	0.0	0.0	0.0	6.1			0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	6.1			0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		0.00	1.00			0.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	2	0	191			0	2868	0	0	2868	0
V/C Ratio(X)	0.00	0.00	0.00	0.74			0.00	0.25	0.00	0.00	0.31	0.00
Avail Cap(c_a), veh/h	0	439	0	362			0	2868	0	0	2868	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00			1.00	2.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	0.00	0.00	0.00	1.00			0.00	1.00	0.00	0.00	0.43	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	34.7			0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	5.7			0.0	0.2	0.0	0.0	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	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	3.3			0.0	0.1	0.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	40.4			0.0	0.2	0.0	0.0	0.1	0.0
LnGrp LOS				D				A			A	
Approach Vol, veh/h		0						706			887	
Approach Delay, s/veh		0.0						0.2			0.1	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6						
Phs Duration (G+Y+Rc), s		67.6	12.4	0.0		67.6						
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5						
Max Green Setting (Gmax), s		33.0	15.5	18.0		33.0						
Max Q Clear Time (g_c+l1), s		2.0	8.1	0.0		2.0						
Green Ext Time (p_c), s		14.4	0.2	0.0		14.4						
Intersection Summary												
HCM 2010 Ctrl Delay			3.5									
HCM 2010 LOS			A									

Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↑↑			↑↑	
Traffic Vol, veh/h	11	23	121	0	0	0	65	590	91	124	675	78
Future Vol, veh/h	11	23	121	0	0	0	65	590	91	124	675	78
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	6	27	142	0	0	0	76	694	107	146	794	92
Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	1632	2086	443				886	0	0	801	0	0
Stage 1	1132	1132	-				-	-	-	-	-	-
Stage 2	500	954	-				-	-	-	-	-	-
Critical Hdwy	6.8	6.5	6.9				4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.8	5.5	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.8	5.5	-				-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3				2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	94	54	568				773	-	-	831	-	-
Stage 1	274	281	-				-	-	-	-	-	-
Stage 2	580	340	-				-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	50	0	568				773	-	-	831	-	-
Mov Cap-2 Maneuver	50	0	-				-	-	-	-	-	-
Stage 1	177	0	-				-	-	-	-	-	-
Stage 2	475	0	-				-	-	-	-	-	-
Approach	EB						NB			SB		
HCM Control Delay, s	21.4						0.9			1.4		
HCM LOS	C											
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR					
Capacity (veh/h)	773	-	-	392	831	-	-					
HCM Lane V/C Ratio	0.099	-	-	0.449	0.176	-	-					
HCM Control Delay (s)	10.2	-	-	21.4	10.3	-	-					
HCM Lane LOS	B	-	-	C	B	-	-					
HCM 95th %tile Q(veh)	0.3	-	-	2.3	0.6	-	-					

HCM 2010 Signalized Intersection Summary

4: Madison Street & Proj DWY 1/Garden Street

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	1	60	66	2	61	84	632	44	44	727	45
Future Volume (veh/h)	35	1	60	66	2	61	84	632	44	44	727	45
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	39	1	67	74	2	69	94	710	49	49	817	51
Adj No. of Lanes	0	1	1	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	267	6	234	155	19	96	150	1499	103	485	2148	134
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.11	0.58	0.58	0.54	1.00	1.00
Sat Flow, veh/h	1229	40	1615	604	129	665	1810	3427	236	1810	3452	215
Grp Volume(v), veh/h	40	0	67	145	0	0	94	374	385	49	427	441
Grp Sat Flow(s),veh/h/ln	1269	0	1615	1398	0	0	1810	1805	1858	1810	1805	1862
Q Serve(g_s), s	0.0	0.0	3.0	5.8	0.0	0.0	4.0	9.6	9.6	1.1	0.0	0.0
Cycle Q Clear(g_c), s	2.3	0.0	3.0	8.1	0.0	0.0	4.0	9.6	9.6	1.1	0.0	0.0
Prop In Lane	0.97		1.00	0.51		0.48	1.00		0.13	1.00		0.12
Lane Grp Cap(c), veh/h	272	0	234	270	0	0	150	790	813	485	1123	1159
V/C Ratio(X)	0.15	0.00	0.29	0.54	0.00	0.00	0.63	0.47	0.47	0.10	0.38	0.38
Avail Cap(c_a), veh/h	467	0	464	481	0	0	204	790	813	485	1123	1159
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.2	0.0	30.5	32.9	0.0	0.0	34.4	11.4	11.4	13.8	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.7	1.7	0.0	0.0	4.2	2.0	2.0	0.1	1.0	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	1.4	3.2	0.0	0.0	2.2	5.2	5.3	0.5	0.3	0.3
LnGrp Delay(d),s/veh	30.5	0.0	31.2	34.5	0.0	0.0	38.6	13.4	13.4	13.9	1.0	1.0
LnGrp LOS	C		C	C			D	B	B	B	A	A
Approach Vol, veh/h		107			145			853			917	
Approach Delay, s/veh		30.9			34.5			16.2			1.7	
Approach LOS		C			C			B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	25.4	39.0		15.6	10.6	53.8		15.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	9.5	34.5		22.5	8.5	35.5		22.5				
Max Q Clear Time (g_c+I1), s	3.1	11.6		5.0	6.0	2.0		10.1				
Green Ext Time (p_c), s	3.0	5.0		1.2	0.0	6.6		1.0				
Intersection Summary												
HCM 2010 Ctrl Delay			11.7									
HCM 2010 LOS			B									

HCM 2010 TWSC
5: Madison Street & Proj DWY 2

7/20/2016

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕		↙	↕	
Traffic Vol, veh/h	20	0	48	6	0	4	78	736	21	8	807	38
Future Vol, veh/h	20	0	48	6	0	4	78	736	21	8	807	38
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	60	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	22	0	53	7	0	4	87	818	23	9	897	42
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1518	1950	469	1469	1960	421	939	0	0	841	0	0
Stage 1	936	936	-	1003	1003	-	-	-	-	-	-	-
Stage 2	582	1014	-	466	957	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	83	65	546	91	64	587	738	-	-	803	-	-
Stage 1	289	346	-	263	322	-	-	-	-	-	-	-
Stage 2	471	319	-	551	339	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	74	57	546	74	56	587	738	-	-	803	-	-
Mov Cap-2 Maneuver	74	57	-	74	56	-	-	-	-	-	-	-
Stage 1	255	342	-	232	284	-	-	-	-	-	-	-
Stage 2	412	281	-	492	335	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	35.9			40			1			0.1		
HCM LOS	E			E								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	738	-	-	190	114	803	-	-				
HCM Lane V/C Ratio	0.117	-	-	0.398	0.097	0.011	-	-				
HCM Control Delay (s)	10.5	-	-	35.9	40	9.5	-	-				
HCM Lane LOS	B	-	-	E	E	A	-	-				
HCM 95th %tile Q(veh)	0.4	-	-	1.8	0.3	0	-	-				

HCM 2010 TWSC
6: Madison Street & Gas Stn Access

7/20/2016

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	33	0	835	860	1
Future Vol, veh/h	0	33	0	835	860	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	36	0	918	945	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	473	946	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	5.3	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	3.1	-	-	-
Pot Cap-1 Maneuver	0	464	422	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	464	422	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	13.4	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	422	-	464	-	-	
HCM Lane V/C Ratio	-	-	0.078	-	-	
HCM Control Delay (s)	0	-	13.4	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.3	-	-	

HCM 2010 Signalized Intersection Summary

7: Madison Street & SR_91 WB

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰	↰	↰	↰			↰	↰
Traffic Volume (veh/h)	0	0	0	318	4	256	304	580	0	0	584	309
Future Volume (veh/h)	0	0	0	318	4	256	304	580	0	0	584	309
Number				3	8	18	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	1900	1900	1900	1900	0	0	1900	1900
Adj Flow Rate, veh/h				342	4	275	327	624	0	0	628	332
Adj No. of Lanes				0	1	1	1	2	0	0	3	1
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				424	5	383	666	2394	0	0	1271	396
Arrive On Green				0.24	0.24	0.24	0.74	1.00	0.00	0.00	0.08	0.08
Sat Flow, veh/h				1790	21	1615	1810	3705	0	0	5358	1615
Grp Volume(v), veh/h				346	0	275	327	624	0	0	628	332
Grp Sat Flow(s),veh/h/ln				1811	0	1615	1810	1805	0	0	1729	1615
Q Serve(g_s), s				14.4	0.0	12.5	6.0	0.0	0.0	0.0	9.3	16.2
Cycle Q Clear(g_c), s				14.4	0.0	12.5	6.0	0.0	0.0	0.0	9.3	16.2
Prop In Lane				0.99		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				429	0	383	666	2394	0	0	1271	396
V/C Ratio(X)				0.81	0.00	0.72	0.49	0.26	0.00	0.00	0.49	0.84
Avail Cap(c_a), veh/h				566	0	505	666	2394	0	0	1271	396
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	0.33	0.33
Upstream Filter(I)				1.00	0.00	1.00	0.94	0.94	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				28.8	0.0	28.1	7.5	0.0	0.0	0.0	32.0	35.2
Incr Delay (d2), s/veh				6.4	0.0	3.4	0.5	0.2	0.0	0.0	1.4	18.8
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				8.0	0.0	5.9	3.0	0.1	0.0	0.0	4.6	9.3
LnGrp Delay(d),s/veh				35.2	0.0	31.4	8.0	0.2	0.0	0.0	33.4	54.0
LnGrp LOS				D		C	A	A			C	D
Approach Vol, veh/h					621			951			960	
Approach Delay, s/veh					33.5			2.9			40.5	
Approach LOS					C			A			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		57.0			33.4	23.6		23.0				
Change Period (Y+Rc), s		4.5			4.5	4.5		4.5				
Max Green Setting (Gmax), s		46.5			22.9	19.1		24.5				
Max Q Clear Time (g_c+I1), s		2.0			8.0	18.2		16.4				
Green Ext Time (p_c), s		6.1			4.7	0.5		2.0				
Intersection Summary												
HCM 2010 Ctrl Delay				24.7								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary

8: Madison Street & SR_91 EB

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	22	80	0	0	0	0	768	376	265	637	0
Future Volume (veh/h)	116	22	80	0	0	0	0	768	376	265	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	1900	1900				0	1900	1900	1900	1900	0
Adj Flow Rate, veh/h	123	23	85				0	817	400	282	678	0
Adj No. of Lanes	1	0	1				0	3	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	184	0	164				0	2939	915	329	2882	0
Arrive On Green	0.10	0.10	0.10				0.00	0.19	0.19	0.36	1.00	0.00
Sat Flow, veh/h	1810	0	1615				0	5358	1615	1810	3705	0
Grp Volume(v), veh/h	123	0	85				0	817	400	282	678	0
Grp Sat Flow(s),veh/h/ln	1810	0	1615				0	1729	1615	1810	1805	0
Q Serve(g_s), s	5.2	0.0	4.0				0.0	10.8	17.5	11.5	0.0	0.0
Cycle Q Clear(g_c), s	5.2	0.0	4.0				0.0	10.8	17.5	11.5	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	184	0	164				0	2939	915	329	2882	0
V/C Ratio(X)	0.67	0.00	0.52				0.00	0.28	0.44	0.86	0.24	0.00
Avail Cap(c_a), veh/h	430	0	384				0	2939	915	498	2882	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	0.33	0.33	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.67	0.67	0.92	0.92	0.00
Uniform Delay (d), s/veh	34.6	0.0	34.1				0.0	18.5	21.2	24.5	0.0	0.0
Incr Delay (d2), s/veh	4.1	0.0	2.5				0.0	0.2	1.0	8.6	0.2	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	2.8	0.0	1.9				0.0	5.2	8.1	6.4	0.1	0.0
LnGrp Delay(d),s/veh	38.8	0.0	36.6				0.0	18.6	22.2	33.1	0.2	0.0
LnGrp LOS	D		D					B	C	C	A	
Approach Vol, veh/h		208						1217			960	
Approach Delay, s/veh		37.9						19.8			9.8	
Approach LOS		D						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	18.5	49.3		12.1		67.9						
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5						
Max Green Setting (Gmax), s	21.5	26.5		18.5		52.5						
Max Q Clear Time (g_c+1.5), s	13.5	19.5		7.2		2.0						
Green Ext Time (p_c), s	0.5	5.4		0.4		18.9						
Intersection Summary												
HCM 2010 Ctrl Delay			17.4									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary

9: Madison Street & Indiana Ave

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	223	782	37	22	160	314	36	610	40	226	315	175
Future Volume (veh/h)	223	782	37	22	160	314	36	610	40	226	315	175
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	242	850	40	24	174	341	39	663	43	246	342	190
Adj No. of Lanes	1	2	0	1	2	0	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, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	290	1226	58	77	417	373	173	856	55	289	705	385
Arrive On Green	0.16	0.35	0.35	0.04	0.23	0.23	0.10	0.25	0.25	0.27	0.52	0.52
Sat Flow, veh/h	1810	3511	165	1810	1805	1615	1810	3443	223	1810	2257	1231
Grp Volume(v), veh/h	242	437	453	24	174	341	39	347	359	246	272	260
Grp Sat Flow(s),veh/h/ln	1810	1805	1871	1810	1805	1615	1810	1805	1861	1810	1805	1683
Q Serve(g_s), s	10.4	16.6	16.6	1.0	6.6	16.5	1.6	14.3	14.4	10.3	7.7	8.0
Cycle Q Clear(g_c), s	10.4	16.6	16.6	1.0	6.6	16.5	1.6	14.3	14.4	10.3	7.7	8.0
Prop In Lane	1.00		0.09	1.00		1.00	1.00		0.12	1.00		0.73
Lane Grp Cap(c), veh/h	290	630	653	77	417	373	173	449	463	289	564	526
V/C Ratio(X)	0.83	0.69	0.69	0.31	0.42	0.91	0.22	0.77	0.78	0.85	0.48	0.49
Avail Cap(c_a), veh/h	294	630	653	170	417	373	173	449	463	294	564	526
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.97	0.97
Uniform Delay (d), s/veh	32.6	22.4	22.4	37.2	26.2	30.0	33.4	28.0	28.0	28.4	15.0	15.1
Incr Delay (d2), s/veh	18.1	3.3	3.2	2.3	0.7	26.2	0.6	12.3	12.0	19.9	2.9	3.2
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	6.6	8.8	9.1	0.6	3.3	10.0	0.8	8.7	8.9	6.7	4.2	4.1
LnGrp Delay(d),s/veh	50.7	25.6	25.5	39.5	26.8	56.2	34.1	40.2	40.0	48.3	17.9	18.3
LnGrp LOS	D	C	C	D	C	E	C	D	D	D	B	B
Approach Vol, veh/h	1132					539		745		778		
Approach Delay, s/veh	30.9					45.9		39.8		27.6		
Approach LOS	C					D		D		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	16.8	23.9	7.4	31.9	11.7	29.0	16.8	22.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	12.5	19.0	7.0	23.5	7.0	24.5	12.5	18.0				
Max Q Clear Time (g_c+1.2), s	12.3	16.4	3.0	18.6	3.6	10.0	12.4	18.5				
Green Ext Time (p_c), s	0.0	1.2	0.0	2.7	1.5	2.9	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	34.7											
HCM 2010 LOS	C											

HCM 2010 TWSC
10: Madison Street & Evans Street

7/20/2016

Intersection												
Int Delay, s/veh	3.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	44	9	26	2	9	66	13	577	8	26	270	29
Future Vol, veh/h	44	9	26	2	9	66	13	577	8	26	270	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	80	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	48	10	28	2	10	72	14	627	9	28	293	32
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1067	1030	309	1045	1042	632	325	0	0	636	0	0
Stage 1	366	366	-	660	660	-	-	-	-	-	-	-
Stage 2	701	664	-	385	382	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	202	235	736	209	232	484	1246	-	-	957	-	-
Stage 1	657	626	-	455	463	-	-	-	-	-	-	-
Stage 2	433	461	-	642	616	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	161	226	736	188	223	484	1246	-	-	957	-	-
Mov Cap-2 Maneuver	161	226	-	188	223	-	-	-	-	-	-	-
Stage 1	650	608	-	450	458	-	-	-	-	-	-	-
Stage 2	357	456	-	590	598	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	30.2			16			0.2			0.7		
HCM LOS	D			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1246	-	-	227	411	957	-	-				
HCM Lane V/C Ratio	0.011	-	-	0.378	0.204	0.03	-	-				
HCM Control Delay (s)	7.9	-	-	30.2	16	8.9	-	-				
HCM Lane LOS	A	-	-	D	C	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	1.7	0.8	0.1	-	-				

HCM 2010 Signalized Intersection Summary

1: Madison Street & Magnolia Ave

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	702	177	264	645	39	107	376	124	38	482	88
Future Volume (veh/h)	94	702	177	264	645	39	107	376	124	38	482	88
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	100	747	188	281	686	41	114	400	132	40	513	94
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	152	786	198	317	1266	76	172	686	224	170	778	142
Arrive On Green	0.08	0.28	0.28	0.17	0.37	0.37	0.03	0.08	0.08	0.09	0.25	0.25
Sat Flow, veh/h	1810	2859	719	1810	3462	207	1810	2677	874	1810	3050	557
Grp Volume(v), veh/h	100	472	463	281	357	370	114	268	264	40	303	304
Grp Sat Flow(s),veh/h/ln	1810	1805	1773	1810	1805	1864	1810	1805	1746	1810	1805	1802
Q Serve(g_s), s	4.3	20.5	20.5	12.1	12.5	12.6	5.0	11.4	11.6	1.6	12.0	12.1
Cycle Q Clear(g_c), s	4.3	20.5	20.5	12.1	12.5	12.6	5.0	11.4	11.6	1.6	12.0	12.1
Prop In Lane	1.00		0.41	1.00		0.11	1.00		0.50	1.00		0.31
Lane Grp Cap(c), veh/h	152	496	488	317	660	682	172	463	447	170	460	459
V/C Ratio(X)	0.66	0.95	0.95	0.89	0.54	0.54	0.66	0.58	0.59	0.24	0.66	0.66
Avail Cap(c_a), veh/h	222	496	488	317	660	682	172	463	447	170	460	459
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	28.5	28.5	32.2	20.1	20.1	37.5	32.5	32.6	33.6	26.7	26.7
Incr Delay (d2), s/veh	4.7	28.2	28.6	24.8	0.9	0.9	9.0	5.1	5.5	0.7	7.2	7.3
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	2.3	14.1	13.9	8.2	6.4	6.6	2.9	6.4	6.3	0.9	6.9	6.9
LnGrp Delay(d),s/veh	40.2	56.7	57.0	57.0	21.0	21.0	46.4	37.6	38.0	34.3	33.8	34.0
LnGrp LOS	D	E	E	E	C	C	D	D	D	C	C	C
Approach Vol, veh/h	1035				1008				646			
Approach Delay, s/veh	55.3				31.0				39.3			
Approach LOS	E				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	11.5	24.5	18.0	26.0	11.6	24.4	10.7	33.3				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	7.0	20.0	13.5	21.5	7.1	19.9	9.3	25.7				
Max Q Clear Time (g_c+I1), s	3.6	13.6	14.1	22.5	7.0	14.1	6.3	14.6				
Green Ext Time (p_c), s	0.1	1.7	0.0	0.0	0.0	1.8	0.1	4.2				
Intersection Summary												
HCM 2010 Ctrl Delay	40.7											
HCM 2010 LOS	D											

HCM 2010 Signalized Intersection Summary

2: Madison Street & Elementary School Exit

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	1	32	1	26	1	619	0	0	862	0
Future Volume (veh/h)	0	0	1	32	1	26	1	619	0	0	862	0
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	1900	1900	1900	1900	1900	1900	1900	1900	0	0	1900	1900
Adj Flow Rate, veh/h	0	0	1	38	1	31	1	728	0	0	1014	0
Adj No. of Lanes	0	1	0	1	0	1	0	2	0	0	2	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	0	84	102	0	255	45	2628	0	0	2679	0
Arrive On Green	0.00	0.00	0.05	0.06	0.16	0.16	1.00	1.00	0.00	0.00	1.00	0.00
Sat Flow, veh/h	0	0	1615	1810	0	1615	0	3627	0	0	3800	0
Grp Volume(v), veh/h	0	0	1	38	0	31	391	338	0	0	1014	0
Grp Sat Flow(s),veh/h/ln	0	0	1615	1810	0	1615	1899	1643	0	0	1805	0
Q Serve(g_s), s	0.0	0.0	0.0	1.6	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	1.6	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		1.00	1.00		1.00	0.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	0	84	102	0	255	1454	1219	0	0	2679	0
V/C Ratio(X)	0.00	0.00	0.01	0.37	0.00	0.12	0.27	0.28	0.00	0.00	0.38	0.00
Avail Cap(c_a), veh/h	0	0	373	204	0	636	1454	1219	0	0	2679	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	0.00	0.65	0.00
Uniform Delay (d), s/veh	0.0	0.0	36.0	36.4	0.0	28.9	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.1	2.3	0.0	0.2	0.5	0.6	0.0	0.0	0.3	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	0.0	0.0	0.0	0.9	0.0	0.6	0.2	0.2	0.0	0.0	0.1	0.0
LnGrp Delay(d),s/veh	0.0	0.0	36.0	38.7	0.0	29.1	0.5	0.6	0.0	0.0	0.3	0.0
LnGrp LOS			D	D		C	A	A			A	
Approach Vol, veh/h		1			69			729			1014	
Approach Delay, s/veh		36.0			34.4			0.5			0.3	
Approach LOS		D			C			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6		8				
Phs Duration (G+Y+Rc), s		63.4	8.5	8.1		63.4		16.6				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5		4.5				
Max Green Setting (Gmax), s		40.0	8.5	18.0		40.0		31.0				
Max Q Clear Time (g_c+I1), s		2.0	3.6	2.0		2.0		3.3				
Green Ext Time (p_c), s		17.0	0.0	0.0		17.0		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay				1.7								
HCM 2010 LOS				A								

Intersection												
Int Delay, s/veh		1.5										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	8	10	68	0	0	0	83	613	15	36	819	40
Future Vol, veh/h	8	10	68	0	0	0	83	613	15	36	819	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	4	11	76	0	0	0	92	681	17	40	910	44
Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	1537	1894	477				954	0	0	698	0	0
Stage 1	1012	1012	-				-	-	-	-	-	-
Stage 2	525	882	-				-	-	-	-	-	-
Critical Hdwy	6.8	6.5	6.9				4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.8	5.5	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.8	5.5	-				-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3				2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	109	71	540				729	-	-	908	-	-
Stage 1	317	319	-				-	-	-	-	-	-
Stage 2	564	367	-				-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	78	0	540				729	-	-	908	-	-
Mov Cap-2 Maneuver	78	0	-				-	-	-	-	-	-
Stage 1	287	0	-				-	-	-	-	-	-
Stage 2	447	0	-				-	-	-	-	-	-
Approach	EB						NB			SB		
HCM Control Delay, s	16.4						1.2			0.4		
HCM LOS	C											
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR					
Capacity (veh/h)	729	-	-	406	908	-	-					
HCM Lane V/C Ratio	0.127	-	-	0.224	0.044	-	-					
HCM Control Delay (s)	10.7	-	-	16.4	9.1	-	-					
HCM Lane LOS	B	-	-	C	A	-	-					
HCM 95th %tile Q(veh)	0.4	-	-	0.8	0.1	-	-					

HCM 2010 Signalized Intersection Summary

4: Madison Street & Proj DWY 1/Garden Street

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	6	122	140	9	61	165	596	48	86	760	77
Future Volume (veh/h)	78	6	122	140	9	61	165	596	48	86	760	77
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	87	7	136	156	10	68	183	662	53	96	844	86
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	178	34	217	262	23	86	334	1355	108	402	1447	147
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.18	0.40	0.40	0.44	0.88	0.88
Sat Flow, veh/h	508	150	952	822	102	379	1810	3386	271	1810	3308	337
Grp Volume(v), veh/h	230	0	0	234	0	0	183	353	362	96	460	470
Grp Sat Flow(s),veh/h/ln	1611	0	0	1303	0	0	1810	1805	1852	1810	1805	1841
Q Serve(g_s), s	0.0	0.0	0.0	3.8	0.0	0.0	7.3	11.7	11.7	2.6	5.2	5.2
Cycle Q Clear(g_c), s	10.0	0.0	0.0	13.8	0.0	0.0	7.3	11.7	11.7	2.6	5.2	5.2
Prop In Lane	0.38		0.59	0.67		0.29	1.00		0.15	1.00		0.18
Lane Grp Cap(c), veh/h	429	0	0	372	0	0	334	722	741	402	790	805
V/C Ratio(X)	0.54	0.00	0.00	0.63	0.00	0.00	0.55	0.49	0.49	0.24	0.58	0.58
Avail Cap(c_a), veh/h	557	0	0	488	0	0	334	722	741	402	790	805
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.6	0.0	0.0	29.2	0.0	0.0	29.6	17.9	17.9	18.0	3.1	3.1
Incr Delay (d2), s/veh	1.0	0.0	0.0	1.8	0.0	0.0	1.9	2.4	2.3	0.3	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	4.7	0.0	0.0	5.1	0.0	0.0	3.8	6.3	6.4	1.3	3.0	3.0
LnGrp Delay(d),s/veh	28.7	0.0	0.0	30.9	0.0	0.0	31.5	20.3	20.2	18.3	6.3	6.2
LnGrp LOS	C			C			C	C	C	B	A	A
Approach Vol, veh/h		230			234			898			1026	
Approach Delay, s/veh		28.7			30.9			22.5			7.4	
Approach LOS		C			C			C			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	21.8	36.0		22.2	18.8	39.0		22.2				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	10.5	31.5		24.5	7.5	34.5		24.5				
Max Q Clear Time (g_c+I1), s	4.6	13.7		12.0	9.3	7.2		15.8				
Green Ext Time (p_c), s	0.4	4.3		2.4	0.0	6.8		1.9				
Intersection Summary												
HCM 2010 Ctrl Delay				17.4								
HCM 2010 LOS				B								

HCM 2010 TWSC
5: Madison Street & Proj DWY 2

7/20/2016

Intersection												
Int Delay, s/veh	12.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕↗		↙	↕↗	
Traffic Vol, veh/h	44	0	99	17	1	32	96	734	48	23	921	79
Future Vol, veh/h	44	0	99	17	1	32	96	734	48	23	921	79
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	60	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	46	0	104	18	1	34	101	773	51	24	969	83
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1648	2084	526	1533	2101	412	1053	0	0	823	0	0
Stage 1	1059	1059	-	1000	1000	-	-	-	-	-	-	-
Stage 2	589	1025	-	533	1101	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	67	54	502	81	52	595	669	-	-	816	-	-
Stage 1	243	304	-	264	324	-	-	-	-	-	-	-
Stage 2	466	315	-	503	290	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	54	44	502	56	43	595	669	-	-	816	-	-
Mov Cap-2 Maneuver	54	44	-	56	43	-	-	-	-	-	-	-
Stage 1	206	295	-	224	275	-	-	-	-	-	-	-
Stage 2	372	267	-	387	281	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	157.5			49.8			1.2			0.2		
HCM LOS	F			E								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	669	-	-	141	131	816	-	-				
HCM Lane V/C Ratio	0.151	-	-	1.068	0.402	0.03	-	-				
HCM Control Delay (s)	11.3	-	-	157.5	49.8	9.5	-	-				
HCM Lane LOS	B	-	-	F	E	A	-	-				
HCM 95th %tile Q(veh)	0.5	-	-	8.1	1.7	0.1	-	-				

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	27	0	876	1031	6
Future Vol, veh/h	0	27	0	876	1031	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	30	0	963	1133	7
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	570	1140	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.1	5.3	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.9	3.1	-	-	-
Pot Cap-1 Maneuver	0	402	340	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	402	340	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.7	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	340	-	402	-	-	
HCM Lane V/C Ratio	-	-	0.074	-	-	
HCM Control Delay (s)	0	-	14.7	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.2	-	-	

HCM 2010 Signalized Intersection Summary

7: Madison Street & SR_91 WB

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰	↱	↰	↱			↱	↰
Traffic Volume (veh/h)	0	0	0	213	1	225	266	652	0	0	757	301
Future Volume (veh/h)	0	0	0	213	1	225	266	652	0	0	757	301
Number				3	8	18	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	1900	1900	1900	1900	0	0	1900	1900
Adj Flow Rate, veh/h				215	1	227	269	659	0	0	765	304
Adj No. of Lanes				0	1	1	1	2	0	0	3	1
Peak Hour Factor				0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				327	2	293	690	2595	0	0	1491	464
Arrive On Green				0.18	0.18	0.18	0.76	1.00	0.00	0.00	0.38	0.38
Sat Flow, veh/h				1802	8	1615	1810	3705	0	0	5358	1615
Grp Volume(v), veh/h				216	0	227	269	659	0	0	765	304
Grp Sat Flow(s),veh/h/ln				1810	0	1615	1810	1805	0	0	1729	1615
Q Serve(g_s), s				8.9	0.0	10.7	4.0	0.0	0.0	0.0	9.1	12.4
Cycle Q Clear(g_c), s				8.9	0.0	10.7	4.0	0.0	0.0	0.0	9.1	12.4
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				328	0	293	690	2595	0	0	1491	464
V/C Ratio(X)				0.66	0.00	0.78	0.39	0.25	0.00	0.00	0.51	0.65
Avail Cap(c_a), veh/h				475	0	424	690	2595	0	0	1491	464
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.33	1.33
Upstream Filter(I)				1.00	0.00	1.00	0.94	0.94	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				30.4	0.0	31.2	6.4	0.0	0.0	0.0	20.4	21.4
Incr Delay (d2), s/veh				2.3	0.0	5.5	0.3	0.2	0.0	0.0	1.3	7.0
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				4.6	0.0	5.2	2.0	0.1	0.0	0.0	4.4	6.4
LnGrp Delay(d),s/veh				32.7	0.0	36.7	6.7	0.2	0.0	0.0	21.7	28.5
LnGrp LOS				C		D	A	A			C	C
Approach Vol, veh/h					443			928			1069	
Approach Delay, s/veh					34.7			2.1			23.6	
Approach LOS					C			A			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		61.5			34.5	27.0		18.5				
Change Period (Y+Rc), s		4.5			4.5	4.5		4.5				
Max Green Setting (Gmax), s		50.5			23.5	22.5		20.5				
Max Q Clear Time (g_c+I1), s		2.0			6.0	14.4		12.7				
Green Ext Time (p_c), s		6.3			5.1	3.9		1.3				
Intersection Summary												
HCM 2010 Ctrl Delay				17.4								
HCM 2010 LOS				B								

HCM 2010 Signalized Intersection Summary

8: Madison Street & SR_91 EB

7/20/2016

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	166	3	149	0	0	0	0	751	405	240	730	0	
Future Volume (veh/h)	166	3	149	0	0	0	0	751	405	240	730	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	1900	1900				0	1900	1900	1900	1900	0	
Adj Flow Rate, veh/h	173	3	155				0	782	422	250	760	0	
Adj No. of Lanes	1	0	1				0	3	1	1	2	0	
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96	
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0	
Cap, veh/h	240	0	214				0	2870	894	297	2770	0	
Arrive On Green	0.13	0.13	0.13				0.00	0.18	0.18	0.33	1.00	0.00	
Sat Flow, veh/h	1810	0	1615				0	5358	1615	1810	3705	0	
Grp Volume(v), veh/h	173	0	155				0	782	422	250	760	0	
Grp Sat Flow(s),veh/h/ln	1810	0	1615				0	1729	1615	1810	1805	0	
Q Serve(g_s), s	7.3	0.0	7.4				0.0	10.4	18.7	10.3	0.0	0.0	
Cycle Q Clear(g_c), s	7.3	0.0	7.4				0.0	10.4	18.7	10.3	0.0	0.0	
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00	
Lane Grp Cap(c), veh/h	240	0	214				0	2870	894	297	2770	0	
V/C Ratio(X)	0.72	0.00	0.72				0.00	0.27	0.47	0.84	0.27	0.00	
Avail Cap(c_a), veh/h	452	0	404				0	2870	894	452	2770	0	
HCM Platoon Ratio	1.00	1.00	1.00				1.00	0.33	0.33	2.00	2.00	1.00	
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.59	0.59	0.91	0.91	0.00	
Uniform Delay (d), s/veh	33.3	0.0	33.3				0.0	18.8	22.2	25.9	0.0	0.0	
Incr Delay (d2), s/veh	4.1	0.0	4.6				0.0	0.1	1.1	7.9	0.2	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	8.9	0.0	3.5				0.0	5.0	8.6	5.7	0.1	0.0	
LnGrp Delay(d),s/veh	37.3	0.0	37.9				0.0	19.0	23.3	33.8	0.2	0.0	
LnGrp LOS	D		D					B	C	C	A		
Approach Vol, veh/h		328						1204			1010		
Approach Delay, s/veh		37.6						20.5			8.5		
Approach LOS		D						C			A		
Timer	1	2	3	4	5	6	7	8					
Assigned Phs	1	2		4		6							
Phs Duration (G+Y+Rc), s	17.1	48.3		14.6		65.4							
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5							
Max Green Setting (Gmax), s	19.5	27.5		19.5		51.5							
Max Q Clear Time (g_c+1.2), s	12.3	20.7		9.4		2.0							
Green Ext Time (p_c), s	0.4	5.4		0.7		19.9							
Intersection Summary													
HCM 2010 Ctrl Delay			18.0										
HCM 2010 LOS			B										

HCM 2010 Signalized Intersection Summary

9: Madison Street & Indiana Ave

7/20/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	291	563	87	61	236	336	60	527	42	238	540	102
Future Volume (veh/h)	291	563	87	61	236	336	60	527	42	238	540	102
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	306	593	92	64	248	354	63	555	44	251	568	107
Adj No. of Lanes	1	2	0	1	2	0	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, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	317	1046	162	131	417	373	170	826	65	271	910	171
Arrive On Green	0.17	0.33	0.33	0.07	0.23	0.23	0.09	0.24	0.24	0.15	0.30	0.30
Sat Flow, veh/h	1810	3134	485	1810	1805	1615	1810	3389	268	1810	3034	570
Grp Volume(v), veh/h	306	341	344	64	248	354	63	295	304	251	337	338
Grp Sat Flow(s),veh/h/ln	1810	1805	1814	1810	1805	1615	1810	1805	1853	1810	1805	1799
Q Serve(g_s), s	13.4	12.4	12.5	2.7	9.8	17.3	2.6	11.8	11.9	11.0	12.9	12.9
Cycle Q Clear(g_c), s	13.4	12.4	12.5	2.7	9.8	17.3	2.6	11.8	11.9	11.0	12.9	12.9
Prop In Lane	1.00		0.27	1.00		1.00	1.00		0.14	1.00		0.32
Lane Grp Cap(c), veh/h	317	602	605	131	417	373	170	440	452	271	542	540
V/C Ratio(X)	0.97	0.57	0.57	0.49	0.59	0.95	0.37	0.67	0.67	0.92	0.62	0.63
Avail Cap(c_a), veh/h	317	602	605	170	417	373	170	440	452	271	542	540
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	0.96	0.96	0.96
Uniform Delay (d), s/veh	32.8	21.9	21.9	35.7	27.4	30.3	34.0	27.3	27.4	33.6	24.1	24.1
Incr Delay (d2), s/veh	41.4	1.2	1.3	2.8	2.3	33.3	1.3	7.9	7.8	34.3	5.1	5.2
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	10.4	6.4	6.4	1.5	5.2	11.1	1.4	6.9	7.1	8.0	7.1	7.2
LnGrp Delay(d),s/veh	74.2	23.1	23.2	38.4	29.7	63.5	35.4	35.3	35.2	67.9	29.2	29.3
LnGrp LOS	E	C	C	D	C	E	D	D	D	E	C	C
Approach Vol, veh/h	991			666			662			926		
Approach Delay, s/veh	38.9			48.5			35.2			39.7		
Approach LOS	D			D			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	16.0	23.5	9.8	30.7	11.5	28.0	18.0	22.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	11.5	19.0	7.0	24.5	7.0	23.5	13.5	18.0				
Max Q Clear Time (g_c+1.0), s	13.0	13.9	4.7	14.5	4.6	14.9	15.4	19.3				
Green Ext Time (p_c), s	0.0	1.8	0.0	5.6	0.9	2.7	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	40.4											
HCM 2010 LOS	D											

HCM 2010 TWSC
10: Madison Street & Evans Street

7/20/2016

Intersection												
Int Delay, s/veh	5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↘		↙	↘	
Traffic Vol, veh/h	50	5	31	4	3	59	27	463	15	77	538	44
Future Vol, veh/h	50	5	31	4	3	59	27	463	15	77	538	44
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	80	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	52	5	32	4	3	61	28	482	16	80	560	46
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1323	1298	583	1309	1313	490	606	0	0	498	0	0
Stage 1	744	744	-	546	546	-	-	-	-	-	-	-
Stage 2	579	554	-	763	767	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	135	163	516	138	160	582	982	-	-	1076	-	-
Stage 1	410	424	-	526	521	-	-	-	-	-	-	-
Stage 2	504	517	-	400	414	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	110	147	516	116	144	582	982	-	-	1076	-	-
Mov Cap-2 Maneuver	110	147	-	116	144	-	-	-	-	-	-	-
Stage 1	398	392	-	511	506	-	-	-	-	-	-	-
Stage 2	435	502	-	342	383	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	54.7			15.2			0.5			1		
HCM LOS	F			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	982	-	-	157	421	1076	-	-				
HCM Lane V/C Ratio	0.029	-	-	0.571	0.163	0.075	-	-				
HCM Control Delay (s)	8.8	-	-	54.7	15.2	8.6	-	-				
HCM Lane LOS	A	-	-	F	C	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	3	0.6	0.2	-	-				

HCM 2010 Signalized Intersection Summary

4: Madison Street & Proj DWY 1/Garden Street

12/9/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	1	60	65	2	60	84	602	43	43	712	45
Future Volume (veh/h)	55	1	60	65	2	60	84	602	43	43	712	45
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	62	1	67	73	2	67	94	676	48	48	800	51
Adj No. of Lanes	0	1	1	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	279	4	254	151	23	95	150	1496	106	462	2102	134
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.11	0.58	0.58	0.51	1.00	1.00
Sat Flow, veh/h	1204	24	1615	528	145	601	1810	3420	243	1810	3447	220
Grp Volume(v), veh/h	63	0	67	142	0	0	94	357	367	48	419	432
Grp Sat Flow(s),veh/h/ln	1228	0	1615	1274	0	0	1810	1805	1857	1810	1805	1861
Q Serve(g_s), s	0.0	0.0	2.9	5.3	0.0	0.0	4.0	9.0	9.0	1.1	0.0	0.0
Cycle Q Clear(g_c), s	3.8	0.0	2.9	9.1	0.0	0.0	4.0	9.0	9.0	1.1	0.0	0.0
Prop In Lane	0.98		1.00	0.51		0.47	1.00		0.13	1.00		0.12
Lane Grp Cap(c), veh/h	282	0	254	269	0	0	150	790	813	462	1101	1135
V/C Ratio(X)	0.22	0.00	0.26	0.53	0.00	0.00	0.63	0.45	0.45	0.10	0.38	0.38
Avail Cap(c_a), veh/h	459	0	464	460	0	0	204	790	813	462	1101	1135
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.0	0.0	29.6	32.5	0.0	0.0	34.4	11.3	11.3	14.9	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.5	1.6	0.0	0.0	4.2	1.9	1.8	0.1	1.0	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	1.3	3.1	0.0	0.0	2.2	4.8	4.9	0.5	0.3	0.3
LnGrp Delay(d),s/veh	30.4	0.0	30.2	34.1	0.0	0.0	38.6	13.1	13.1	15.0	1.0	1.0
LnGrp LOS	C		C	C			D	B	B	B	A	A
Approach Vol, veh/h		130			142			818			899	
Approach Delay, s/veh		30.3			34.1			16.1			1.7	
Approach LOS		C			C			B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	24.4	39.0		16.6	10.6	52.8		16.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	9.5	34.5		22.5	8.5	35.5		22.5				
Max Q Clear Time (g_c+I1), s	3.1	11.0		5.8	6.0	2.0		11.1				
Green Ext Time (p_c), s	2.9	4.7		1.3	0.0	6.4		1.0				
Intersection Summary												
HCM 2010 Ctrl Delay			11.8									
HCM 2010 LOS			B									

HCM 2010 TWSC
5: Madison Street & Proj DWY 2

12/9/2016

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕		↙	↕	
Traffic Vol, veh/h	0	0	48	6	0	4	77	722	21	8	791	38
Future Vol, veh/h	0	0	48	6	0	4	77	722	21	8	791	38
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	60	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	53	7	0	4	86	802	23	9	879	42
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1490	1915	461	1442	1924	413	921	0	0	826	0	0
Stage 1	918	918	-	985	985	-	-	-	-	-	-	-
Stage 2	572	997	-	457	939	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	87	68	553	95	68	594	750	-	-	813	-	-
Stage 1	296	353	-	270	329	-	-	-	-	-	-	-
Stage 2	477	325	-	558	345	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	78	60	553	78	60	594	750	-	-	813	-	-
Mov Cap-2 Maneuver	78	60	-	78	60	-	-	-	-	-	-	-
Stage 1	262	349	-	239	291	-	-	-	-	-	-	-
Stage 2	419	288	-	499	341	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	12.2			38			1			0.1		
HCM LOS	B			E								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	750	-	-	553	120	813	-	-				
HCM Lane V/C Ratio	0.114	-	-	0.096	0.093	0.011	-	-				
HCM Control Delay (s)	10.4	-	-	12.2	38	9.5	-	-				
HCM Lane LOS	B	-	-	B	E	A	-	-				
HCM 95th %tile Q(veh)	0.4	-	-	0.3	0.3	0	-	-				

HCM 2010 TWSC
10: Madison Street & Evans Street

12/9/2016

Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	43	9	25	2	9	65	13	565	8	26	263	29
Future Vol, veh/h	43	9	25	2	9	65	13	565	8	26	263	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	80	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	47	10	27	2	10	71	14	614	9	28	286	32
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1045	1009	302	1024	1021	618	317	0	0	623	0	0
Stage 1	358	358	-	647	647	-	-	-	-	-	-	-
Stage 2	687	651	-	377	374	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	209	242	742	216	238	493	1255	-	-	968	-	-
Stage 1	664	631	-	463	470	-	-	-	-	-	-	-
Stage 2	440	468	-	649	621	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	168	232	742	195	229	493	1255	-	-	968	-	-
Mov Cap-2 Maneuver	168	232	-	195	229	-	-	-	-	-	-	-
Stage 1	657	613	-	458	465	-	-	-	-	-	-	-
Stage 2	365	463	-	597	603	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	28.7			15.7			0.2			0.7		
HCM LOS	D			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1255	-	-	234	419	968	-	-				
HCM Lane V/C Ratio	0.011	-	-	0.358	0.197	0.029	-	-				
HCM Control Delay (s)	7.9	-	-	28.7	15.7	8.8	-	-				
HCM Lane LOS	A	-	-	D	C	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	1.5	0.7	0.1	-	-				

HCM 2010 Signalized Intersection Summary 4: Madison Street & Proj DWY 1/Garden Street

12/9/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	6	122	137	9	60	164	552	47	84	744	77
Future Volume (veh/h)	122	6	122	137	9	60	164	552	47	84	744	77
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	136	7	136	152	10	67	182	613	52	93	827	86
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	227	22	173	259	25	86	330	1348	114	397	1444	150
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.24	0.53	0.53	0.44	0.88	0.88
Sat Flow, veh/h	695	94	751	798	109	375	1810	3369	285	1810	3301	343
Grp Volume(v), veh/h	279	0	0	229	0	0	182	328	337	93	452	461
Grp Sat Flow(s),veh/h/ln	1540	0	0	1283	0	0	1810	1805	1850	1810	1805	1839
Q Serve(g_s), s	0.0	0.0	0.0	0.4	0.0	0.0	7.0	9.0	9.0	2.6	5.0	5.0
Cycle Q Clear(g_c), s	13.4	0.0	0.0	13.8	0.0	0.0	7.0	9.0	9.0	2.6	5.0	5.0
Prop In Lane	0.49		0.49	0.66		0.29	1.00		0.15	1.00		0.19
Lane Grp Cap(c), veh/h	422	0	0	370	0	0	330	722	740	397	790	805
V/C Ratio(X)	0.66	0.00	0.00	0.62	0.00	0.00	0.55	0.45	0.46	0.23	0.57	0.57
Avail Cap(c_a), veh/h	543	0	0	483	0	0	330	722	740	397	790	805
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.8	0.0	0.0	28.8	0.0	0.0	27.5	13.3	13.3	18.2	3.1	3.1
Incr Delay (d2), s/veh	2.0	0.0	0.0	1.7	0.0	0.0	2.0	2.1	2.0	0.3	3.0	3.0
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	6.0	0.0	0.0	4.9	0.0	0.0	3.7	4.8	4.9	1.3	2.9	3.0
LnGrp Delay(d),s/veh	30.7	0.0	0.0	30.5	0.0	0.0	29.4	15.4	15.4	18.5	6.1	6.1
LnGrp LOS	C			C			C	B	B	B	A	A
Approach Vol, veh/h		279			229			847			1006	
Approach Delay, s/veh		30.7			30.5			18.4			7.3	
Approach LOS		C			C			B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	21.6	36.0		22.4	18.6	39.0		22.4				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	10.5	31.5		24.5	7.5	34.5		24.5				
Max Q Clear Time (g_c+I1), s	4.6	11.0		15.4	9.0	7.0		15.8				
Green Ext Time (p_c), s	0.4	4.1		2.2	0.0	6.6		2.2				
Intersection Summary												
HCM 2010 Ctrl Delay				16.3								
HCM 2010 LOS				B								

HCM 2010 TWSC
5: Madison Street & Proj DWY 2

12/9/2016

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙ ↘		↙ ↘		↙ ↘	
Traffic Vol, veh/h	0	0	98	17	1	31	95	719	47	23	902	78
Future Vol, veh/h	0	0	98	17	1	31	95	719	47	23	902	78
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	60	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	103	18	1	33	100	757	49	24	949	82
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1618	2045	516	1505	2062	403	1032	0	0	806	0	0
Stage 1	1039	1039	-	982	982	-	-	-	-	-	-	-
Stage 2	579	1006	-	523	1080	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	70	57	509	85	55	603	681	-	-	828	-	-
Stage 1	250	310	-	271	330	-	-	-	-	-	-	-
Stage 2	473	321	-	510	297	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	57	47	509	59	46	603	681	-	-	828	-	-
Mov Cap-2 Maneuver	57	47	-	59	46	-	-	-	-	-	-	-
Stage 1	213	301	-	231	282	-	-	-	-	-	-	-
Stage 2	380	274	-	395	288	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	13.9			46.8			1.2			0.2		
HCM LOS	B			E								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	681	-	-	509	136	828	-	-				
HCM Lane V/C Ratio	0.147	-	-	0.203	0.379	0.029	-	-				
HCM Control Delay (s)	11.2	-	-	13.9	46.8	9.5	-	-				
HCM Lane LOS	B	-	-	B	E	A	-	-				
HCM 95th %tile Q(veh)	0.5	-	-	0.8	1.6	0.1	-	-				

HCM 2010 TWSC
10: Madison Street & Evans Street

12/9/2016

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	5	79	4	3	58	26	452	15	76	527	43
Future Vol, veh/h	0	5	79	4	3	58	26	452	15	76	527	43
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	80	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	5	82	4	3	60	27	471	16	79	549	45
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1295	1271	571	1306	1285	479	594	0	0	486	0	0
Stage 1	730	730	-	533	533	-	-	-	-	-	-	-
Stage 2	565	541	-	773	752	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	141	169	524	138	166	591	992	-	-	1087	-	-
Stage 1	417	431	-	534	528	-	-	-	-	-	-	-
Stage 2	513	524	-	395	421	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	115	152	524	105	150	591	992	-	-	1087	-	-
Mov Cap-2 Maneuver	115	152	-	105	150	-	-	-	-	-	-	-
Stage 1	406	400	-	519	514	-	-	-	-	-	-	-
Stage 2	445	510	-	305	390	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	14.7			15.3			0.5			1		
HCM LOS	B			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	992	-	-	457	416	1087	-	-				
HCM Lane V/C Ratio	0.027	-	-	0.191	0.163	0.073	-	-				
HCM Control Delay (s)	8.7	-	-	14.7	15.3	8.6	-	-				
HCM Lane LOS	A	-	-	B	C	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.7	0.6	0.2	-	-				

HCM 2010 Signalized Intersection Summary 4: Madison Street & Proj DWY 1/Garden Street

12/9/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	1	60	66	2	61	84	614	44	44	726	45
Future Volume (veh/h)	55	1	60	66	2	61	84	614	44	44	726	45
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	62	1	67	74	2	69	94	690	49	49	816	51
Adj No. of Lanes	0	1	1	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	280	4	258	152	23	97	150	1496	106	458	2097	131
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.11	0.58	0.58	0.51	1.00	1.00
Sat Flow, veh/h	1194	24	1615	526	143	607	1810	3420	243	1810	3451	216
Grp Volume(v), veh/h	63	0	67	145	0	0	94	364	375	49	427	440
Grp Sat Flow(s),veh/h/ln	1218	0	1615	1276	0	0	1810	1805	1857	1810	1805	1862
Q Serve(g_s), s	0.0	0.0	2.9	5.4	0.0	0.0	4.0	9.2	9.2	1.1	0.0	0.0
Cycle Q Clear(g_c), s	3.8	0.0	2.9	9.2	0.0	0.0	4.0	9.2	9.2	1.1	0.0	0.0
Prop In Lane	0.98		1.00	0.51		0.48	1.00		0.13	1.00		0.12
Lane Grp Cap(c), veh/h	284	0	258	271	0	0	150	790	813	458	1097	1131
V/C Ratio(X)	0.22	0.00	0.26	0.53	0.00	0.00	0.63	0.46	0.46	0.11	0.39	0.39
Avail Cap(c_a), veh/h	457	0	464	460	0	0	204	790	813	458	1097	1131
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.9	0.0	29.5	32.4	0.0	0.0	34.4	11.3	11.3	15.0	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.5	1.6	0.0	0.0	4.2	1.9	1.9	0.1	1.0	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	1.3	3.2	0.0	0.0	2.2	4.9	5.0	0.6	0.3	0.3
LnGrp Delay(d),s/veh	30.2	0.0	30.0	34.1	0.0	0.0	38.6	13.3	13.2	15.1	1.0	1.0
LnGrp LOS	C		C	C			D	B	B	B	A	A
Approach Vol, veh/h		130			145			833			916	
Approach Delay, s/veh		30.1			34.1			16.1			1.8	
Approach LOS		C			C			B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	24.2	39.0		16.8	10.6	52.6		16.8				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	9.5	34.5		22.5	8.5	35.5		22.5				
Max Q Clear Time (g_c+I1), s	3.1	11.2		5.8	6.0	2.0		11.2				
Green Ext Time (p_c), s	2.9	4.8		1.3	0.0	6.6		1.1				
Intersection Summary												
HCM 2010 Ctrl Delay			11.8									
HCM 2010 LOS			B									

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙ ↗			↙ ↗		
Traffic Vol, veh/h	0	0	48	6	0	4	78	735	21	8	806	38
Future Vol, veh/h	0	0	48	6	0	4	78	735	21	8	806	38
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	60	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	53	7	0	4	87	817	23	9	896	42
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1516	1947	469	1468	1958	420	938	0	0	840	0	0
Stage 1	934	934	-	1002	1002	-	-	-	-	-	-	-
Stage 2	582	1013	-	466	956	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	84	65	546	91	64	588	739	-	-	804	-	-
Stage 1	290	347	-	264	323	-	-	-	-	-	-	-
Stage 2	471	319	-	551	339	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	75	57	546	74	56	588	739	-	-	804	-	-
Mov Cap-2 Maneuver	75	57	-	74	56	-	-	-	-	-	-	-
Stage 1	256	343	-	233	285	-	-	-	-	-	-	-
Stage 2	412	281	-	492	335	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	12.3			40			1			0.1		
HCM LOS	B			E								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	739	-	-	546	114	804	-	-				
HCM Lane V/C Ratio	0.117	-	-	0.098	0.097	0.011	-	-				
HCM Control Delay (s)	10.5	-	-	12.3	40	9.5	-	-				
HCM Lane LOS	B	-	-	B	E	A	-	-				
HCM 95th %tile Q(veh)	0.4	-	-	0.3	0.3	0	-	-				

HCM 2010 TWSC
10: Madison Street & Evans Street

12/9/2016

Intersection												
Int Delay, s/veh	3.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	44	9	26	2	9	66	13	576	8	26	268	29
Future Vol, veh/h	44	9	26	2	9	66	13	576	8	26	268	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	80	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	48	10	28	2	10	72	14	626	9	28	291	32
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1063	1027	307	1042	1038	630	323	0	0	635	0	0
Stage 1	364	364	-	659	659	-	-	-	-	-	-	-
Stage 2	699	663	-	383	379	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	203	236	738	210	233	485	1248	-	-	958	-	-
Stage 1	659	627	-	456	464	-	-	-	-	-	-	-
Stage 2	434	462	-	644	618	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	162	227	738	189	224	485	1248	-	-	958	-	-
Mov Cap-2 Maneuver	162	227	-	189	224	-	-	-	-	-	-	-
Stage 1	652	609	-	451	459	-	-	-	-	-	-	-
Stage 2	358	457	-	592	600	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	30			16			0.2			0.7		
HCM LOS	D			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1248	-	-	228	412	958	-	-				
HCM Lane V/C Ratio	0.011	-	-	0.377	0.203	0.029	-	-				
HCM Control Delay (s)	7.9	-	-	30	16	8.9	-	-				
HCM Lane LOS	A	-	-	D	C	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	1.7	0.8	0.1	-	-				

HCM 2010 Signalized Intersection Summary 4: Madison Street & Proj DWY 1/Garden Street

12/9/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	6	122	140	9	61	165	564	48	86	759	77
Future Volume (veh/h)	122	6	122	140	9	61	165	564	48	86	759	77
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	136	7	136	156	10	68	183	627	53	96	843	86
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	229	22	176	263	25	87	323	1348	114	391	1447	148
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.24	0.53	0.53	0.43	0.88	0.88
Sat Flow, veh/h	695	95	751	805	105	373	1810	3370	285	1810	3308	337
Grp Volume(v), veh/h	279	0	0	234	0	0	183	335	345	96	460	469
Grp Sat Flow(s),veh/h/ln	1542	0	0	1283	0	0	1810	1805	1850	1810	1805	1840
Q Serve(g_s), s	0.0	0.0	0.0	0.8	0.0	0.0	7.1	9.2	9.3	2.7	5.2	5.2
Cycle Q Clear(g_c), s	13.3	0.0	0.0	14.1	0.0	0.0	7.1	9.2	9.3	2.7	5.2	5.2
Prop In Lane	0.49		0.49	0.67		0.29	1.00		0.15	1.00		0.18
Lane Grp Cap(c), veh/h	427	0	0	375	0	0	323	722	740	391	790	805
V/C Ratio(X)	0.65	0.00	0.00	0.62	0.00	0.00	0.57	0.46	0.47	0.25	0.58	0.58
Avail Cap(c_a), veh/h	543	0	0	483	0	0	323	722	740	391	790	805
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.5	0.0	0.0	28.8	0.0	0.0	27.8	13.4	13.4	18.6	3.1	3.1
Incr Delay (d2), s/veh	1.9	0.0	0.0	1.7	0.0	0.0	2.3	2.1	2.1	0.3	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	6.0	0.0	0.0	5.1	0.0	0.0	3.7	4.9	5.0	1.4	3.0	3.0
LnGrp Delay(d),s/veh	30.4	0.0	0.0	30.5	0.0	0.0	30.0	15.5	15.5	18.9	6.3	6.2
LnGrp LOS	C			C			C	B	B	B	A	A
Approach Vol, veh/h		279			234			863			1025	
Approach Delay, s/veh		30.4			30.5			18.6			7.4	
Approach LOS		C			C			B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	21.3	36.0		22.7	18.3	39.0		22.7				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	10.5	31.5		24.5	7.5	34.5		24.5				
Max Q Clear Time (g_c+I1), s	4.7	11.3		15.3	9.1	7.2		16.1				
Green Ext Time (p_c), s	0.4	4.2		2.3	0.0	6.8		2.1				
Intersection Summary												
HCM 2010 Ctrl Delay	16.4											
HCM 2010 LOS	B											

HCM 2010 TWSC
5: Madison Street & Proj DWY 2

12/9/2016

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙ ↗			↙ ↗		
Traffic Vol, veh/h	0	0	99	17	1	32	96	732	48	23	919	79
Future Vol, veh/h	0	0	99	17	1	32	96	732	48	23	919	79
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	60	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	104	18	1	34	101	771	51	24	967	83
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1645	2080	525	1530	2097	411	1051	0	0	821	0	0
Stage 1	1057	1057	-	998	998	-	-	-	-	-	-	-
Stage 2	588	1023	-	532	1099	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	67	54	502	82	53	596	670	-	-	817	-	-
Stage 1	244	304	-	265	324	-	-	-	-	-	-	-
Stage 2	467	316	-	504	291	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	54	45	502	56	44	596	670	-	-	817	-	-
Mov Cap-2 Maneuver	54	45	-	56	44	-	-	-	-	-	-	-
Stage 1	207	295	-	225	275	-	-	-	-	-	-	-
Stage 2	373	268	-	388	282	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	14			49.3			1.2			0.2		
HCM LOS	B			E								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	670	-	-	502	132	817	-	-				
HCM Lane V/C Ratio	0.151	-	-	0.208	0.399	0.03	-	-				
HCM Control Delay (s)	11.3	-	-	14	49.3	9.5	-	-				
HCM Lane LOS	B	-	-	B	E	A	-	-				
HCM 95th %tile Q(veh)	0.5	-	-	0.8	1.7	0.1	-	-				

HCM 2010 TWSC
10: Madison Street & Evans Street

12/9/2016

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	5	81	4	3	59	27	461	15	77	537	44
Future Vol, veh/h	0	5	81	4	3	59	27	461	15	77	537	44
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	80	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	5	84	4	3	61	28	480	16	80	559	46
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1320	1295	582	1332	1310	488	605	0	0	496	0	0
Stage 1	743	743	-	544	544	-	-	-	-	-	-	-
Stage 2	577	552	-	788	766	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	135	164	517	133	160	584	983	-	-	1078	-	-
Stage 1	410	425	-	527	522	-	-	-	-	-	-	-
Stage 2	506	518	-	387	415	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	110	148	517	100	144	584	983	-	-	1078	-	-
Mov Cap-2 Maneuver	110	148	-	100	144	-	-	-	-	-	-	-
Stage 1	398	393	-	512	507	-	-	-	-	-	-	-
Stage 2	437	503	-	296	384	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	14.9			15.6			0.5			1		
HCM LOS	B			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	983	-	-	452	408	1078	-	-				
HCM Lane V/C Ratio	0.029	-	-	0.198	0.169	0.074	-	-				
HCM Control Delay (s)	8.8	-	-	14.9	15.6	8.6	-	-				
HCM Lane LOS	A	-	-	B	C	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.7	0.6	0.2	-	-				

HCM 2010 Signalized Intersection Summary

4: Madison Street & Proj DWY 1/Garden Street

12/9/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	1	60	66	2	61	84	615	44	44	727	45
Future Volume (veh/h)	55	1	60	66	2	61	84	615	44	44	727	45
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	62	1	67	74	2	69	94	691	49	49	817	51
Adj No. of Lanes	0	1	1	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	280	4	258	152	23	97	150	1496	106	458	2097	131
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.11	0.58	0.58	0.51	1.00	1.00
Sat Flow, veh/h	1194	24	1615	526	143	607	1810	3420	242	1810	3452	215
Grp Volume(v), veh/h	63	0	67	145	0	0	94	364	376	49	427	441
Grp Sat Flow(s),veh/h/ln	1218	0	1615	1276	0	0	1810	1805	1857	1810	1805	1862
Q Serve(g_s), s	0.0	0.0	2.9	5.4	0.0	0.0	4.0	9.2	9.3	1.1	0.0	0.0
Cycle Q Clear(g_c), s	3.8	0.0	2.9	9.2	0.0	0.0	4.0	9.2	9.3	1.1	0.0	0.0
Prop In Lane	0.98		1.00	0.51		0.48	1.00		0.13	1.00		0.12
Lane Grp Cap(c), veh/h	284	0	258	271	0	0	150	790	813	458	1097	1131
V/C Ratio(X)	0.22	0.00	0.26	0.53	0.00	0.00	0.63	0.46	0.46	0.11	0.39	0.39
Avail Cap(c_a), veh/h	457	0	464	460	0	0	204	790	813	458	1097	1131
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.9	0.0	29.5	32.4	0.0	0.0	34.4	11.3	11.3	15.0	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.5	1.6	0.0	0.0	4.2	1.9	1.9	0.1	1.0	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	1.3	3.2	0.0	0.0	2.2	4.9	5.0	0.6	0.3	0.3
LnGrp Delay(d),s/veh	30.2	0.0	30.0	34.1	0.0	0.0	38.6	13.3	13.2	15.1	1.0	1.0
LnGrp LOS	C		C	C			D	B	B	B	A	A
Approach Vol, veh/h		130			145			834			917	
Approach Delay, s/veh		30.1			34.1			16.1			1.8	
Approach LOS		C			C			B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	24.2	39.0		16.8	10.6	52.6		16.8				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	9.5	34.5		22.5	8.5	35.5		22.5				
Max Q Clear Time (g_c+I1), s	3.1	11.3		5.8	6.0	2.0		11.2				
Green Ext Time (p_c), s	2.9	4.8		1.3	0.0	6.6		1.1				
Intersection Summary												
HCM 2010 Ctrl Delay			11.8									
HCM 2010 LOS			B									

HCM 2010 TWSC
5: Madison Street & Proj DWY 2

12/9/2016

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕		↙	↕	
Traffic Vol, veh/h	0	0	48	6	0	4	78	736	21	8	807	38
Future Vol, veh/h	0	0	48	6	0	4	78	736	21	8	807	38
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	60	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	53	7	0	4	87	818	23	9	897	42
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1518	1950	469	1469	1960	421	939	0	0	841	0	0
Stage 1	936	936	-	1003	1003	-	-	-	-	-	-	-
Stage 2	582	1014	-	466	957	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	83	65	546	91	64	587	738	-	-	803	-	-
Stage 1	289	346	-	263	322	-	-	-	-	-	-	-
Stage 2	471	319	-	551	339	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	74	57	546	74	56	587	738	-	-	803	-	-
Mov Cap-2 Maneuver	74	57	-	74	56	-	-	-	-	-	-	-
Stage 1	255	342	-	232	284	-	-	-	-	-	-	-
Stage 2	412	281	-	492	335	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	12.3			40			1			0.1		
HCM LOS	B			E								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	738	-	-	546	114	803	-	-				
HCM Lane V/C Ratio	0.117	-	-	0.098	0.097	0.011	-	-				
HCM Control Delay (s)	10.5	-	-	12.3	40	9.5	-	-				
HCM Lane LOS	B	-	-	B	E	A	-	-				
HCM 95th %tile Q(veh)	0.4	-	-	0.3	0.3	0	-	-				

HCM 2010 TWSC
10: Madison Street & Evans Street

12/9/2016

Intersection												
Int Delay, s/veh	3.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	44	9	26	2	9	66	13	577	8	26	270	29
Future Vol, veh/h	44	9	26	2	9	66	13	577	8	26	270	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	80	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	48	10	28	2	10	72	14	627	9	28	293	32
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1067	1030	309	1045	1042	632	325	0	0	636	0	0
Stage 1	366	366	-	660	660	-	-	-	-	-	-	-
Stage 2	701	664	-	385	382	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	202	235	736	209	232	484	1246	-	-	957	-	-
Stage 1	657	626	-	455	463	-	-	-	-	-	-	-
Stage 2	433	461	-	642	616	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	161	226	736	188	223	484	1246	-	-	957	-	-
Mov Cap-2 Maneuver	161	226	-	188	223	-	-	-	-	-	-	-
Stage 1	650	608	-	450	458	-	-	-	-	-	-	-
Stage 2	357	456	-	590	598	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	30.2			16			0.2			0.7		
HCM LOS	D			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1246	-	-	227	411	957	-	-				
HCM Lane V/C Ratio	0.011	-	-	0.378	0.204	0.03	-	-				
HCM Control Delay (s)	7.9	-	-	30.2	16	8.9	-	-				
HCM Lane LOS	A	-	-	D	C	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	1.7	0.8	0.1	-	-				

HCM 2010 Signalized Intersection Summary

4: Madison Street & Proj DWY 1/Garden Street

12/9/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	6	122	140	9	61	165	565	48	86	760	77
Future Volume (veh/h)	122	6	122	140	9	61	165	565	48	86	760	77
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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	136	7	136	156	10	68	183	628	53	96	844	86
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	229	22	176	263	25	87	323	1348	114	391	1447	147
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.24	0.53	0.53	0.43	0.88	0.88
Sat Flow, veh/h	695	95	751	805	105	373	1810	3371	284	1810	3308	337
Grp Volume(v), veh/h	279	0	0	234	0	0	183	336	345	96	460	470
Grp Sat Flow(s),veh/h/ln	1542	0	0	1283	0	0	1810	1805	1850	1810	1805	1841
Q Serve(g_s), s	0.0	0.0	0.0	0.8	0.0	0.0	7.1	9.3	9.3	2.7	5.2	5.2
Cycle Q Clear(g_c), s	13.3	0.0	0.0	14.1	0.0	0.0	7.1	9.3	9.3	2.7	5.2	5.2
Prop In Lane	0.49		0.49	0.67		0.29	1.00		0.15	1.00		0.18
Lane Grp Cap(c), veh/h	427	0	0	375	0	0	323	722	740	391	790	805
V/C Ratio(X)	0.65	0.00	0.00	0.62	0.00	0.00	0.57	0.47	0.47	0.25	0.58	0.58
Avail Cap(c_a), veh/h	543	0	0	483	0	0	323	722	740	391	790	805
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.5	0.0	0.0	28.8	0.0	0.0	27.8	13.4	13.4	18.6	3.1	3.1
Incr Delay (d2), s/veh	1.9	0.0	0.0	1.7	0.0	0.0	2.3	2.1	2.1	0.3	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	6.0	0.0	0.0	5.1	0.0	0.0	3.7	4.9	5.0	1.4	3.0	3.0
LnGrp Delay(d),s/veh	30.4	0.0	0.0	30.5	0.0	0.0	30.0	15.5	15.5	18.9	6.3	6.2
LnGrp LOS	C			C			C	B	B	B	A	A
Approach Vol, veh/h		279			234			864			1026	
Approach Delay, s/veh		30.4			30.5			18.6			7.4	
Approach LOS		C			C			B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	21.3	36.0		22.7	18.3	39.0		22.7				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	10.5	31.5		24.5	7.5	34.5		24.5				
Max Q Clear Time (g_c+I1), s	4.7	11.3		15.3	9.1	7.2		16.1				
Green Ext Time (p_c), s	0.4	4.2		2.3	0.0	6.8		2.1				
Intersection Summary												
HCM 2010 Ctrl Delay				16.4								
HCM 2010 LOS				B								

HCM 2010 TWSC
5: Madison Street & Proj DWY 2

12/9/2016

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	99	17	1	32	96	734	48	23	921	79
Future Vol, veh/h	0	0	99	17	1	32	96	734	48	23	921	79
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	60	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	104	18	1	34	101	773	51	24	969	83
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1648	2084	526	1533	2101	412	1053	0	0	823	0	0
Stage 1	1059	1059	-	1000	1000	-	-	-	-	-	-	-
Stage 2	589	1025	-	533	1101	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	67	54	502	81	52	595	669	-	-	816	-	-
Stage 1	243	304	-	264	324	-	-	-	-	-	-	-
Stage 2	466	315	-	503	290	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	54	44	502	56	43	595	669	-	-	816	-	-
Mov Cap-2 Maneuver	54	44	-	56	43	-	-	-	-	-	-	-
Stage 1	206	295	-	224	275	-	-	-	-	-	-	-
Stage 2	372	267	-	387	281	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	14			49.8			1.2			0.2		
HCM LOS	B			E								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	669	-	-	502	131	816	-	-				
HCM Lane V/C Ratio	0.151	-	-	0.208	0.402	0.03	-	-				
HCM Control Delay (s)	11.3	-	-	14	49.8	9.5	-	-				
HCM Lane LOS	B	-	-	B	E	A	-	-				
HCM 95th %tile Q(veh)	0.5	-	-	0.8	1.7	0.1	-	-				

HCM 2010 TWSC
10: Madison Street & Evans Street

12/9/2016

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	5	81	4	3	59	27	463	15	77	538	44
Future Vol, veh/h	0	5	81	4	3	59	27	463	15	77	538	44
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	80	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	5	84	4	3	61	28	482	16	80	560	46
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1323	1298	583	1335	1313	490	606	0	0	498	0	0
Stage 1	744	744	-	546	546	-	-	-	-	-	-	-
Stage 2	579	554	-	789	767	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	135	163	516	132	160	582	982	-	-	1076	-	-
Stage 1	410	424	-	526	521	-	-	-	-	-	-	-
Stage 2	504	517	-	387	414	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	110	147	516	99	144	582	982	-	-	1076	-	-
Mov Cap-2 Maneuver	110	147	-	99	144	-	-	-	-	-	-	-
Stage 1	398	392	-	511	506	-	-	-	-	-	-	-
Stage 2	435	502	-	296	383	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	15			15.7			0.5			1		
HCM LOS	C			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	982	-	-	450	406	1076	-	-				
HCM Lane V/C Ratio	0.029	-	-	0.199	0.169	0.075	-	-				
HCM Control Delay (s)	8.8	-	-	15	15.7	8.6	-	-				
HCM Lane LOS	A	-	-	C	C	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.7	0.6	0.2	-	-				

APPENDIX E:

PROPOSED MADISON STREET LAYOUT

Exhibit 9 - Initial Study