

APPENDIX A:
RESUME OF PREPARER

WILLIAM A. STIMPSON, P.E.

Senior Traffic Engineer



PROFESSIONAL EXPERIENCE

Two degrees in civil engineering and 47 years of experience in transportation and traffic engineering, specializing in traffic safety and site planning. Traffic safety work has included driver performance research, facility safety auditing, and crash litigation support. Site planning work has included plan development and review, traffic impact analysis, and access management. Has also dealt with parking, ridesharing and bicycling incentives, and freight transportation. Registered Professional Engineer in Michigan since 1980 and expert witness since 1987. Practical experience as a countywide Traffic Engineering Supervisor, 1991-93.

1998 to Present GIFFELS WEBSTER (formerly Clearzoning/Birchler Arroyo Associates) – Washington, Michigan
Senior Traffic Engineer

Mr. Stimpson has performed traffic reviews of hundreds of site plans; prepared shared parking studies, thoroughfare plans, crash data studies, corridor safety evaluations, and access management studies; conducted and reviewed numerous traffic impact studies; and completed signal warrant evaluations and cut-through traffic studies for both public and private clients. He has also investigated individual traffic crashes relative to alleged highway-tort, premises, and/or personal liability, and has provided expert testimony as needed. Mr. Stimpson:

- ♦ Is a skilled site plan reviewer, providing valuable advice to municipalities and private developers. His comprehensive traffic review of a site plan can dramatically improve on-site circulation, access to and from the public road network, and pedestrian safety. He is also an expert in shared parking analysis, offering the ability to reduce unnecessary impervious surface area and increase site efficiency.
- ♦ Has provided traffic engineering, parking, and safety consulting services to several Michigan communities, including the cities of Novi, Rochester, Woodhaven, and Lathrup Village; townships of Shelby, Grand Blanc, and Lenox; and villages of Bingham Farms and Mattawan.
- ♦ Formulated a new comprehensive policy for traffic impact studies (subsequently adopted by several client communities); reviews such studies for our municipal clients; and prepares such studies for our private clients.
- ♦ Developed access management plans for Southfield Road in Lathrup Village; Van Dyke Avenue in Shelby Township; M-24 in Lapeer County; Novi Road in Novi; and Allen and West Roads in Woodhaven.
- ♦ Consults nationally in crash litigation matters. Has deposition and trial experience in both civil and criminal cases. Court-accepted expert witness in traffic engineering and crash causation analysis.

1995 to 1998 WILLIAM A. STIMPSON, P.E. – Rochester, Michigan
Self-Employed Consultant

- ♦ Served as primary author of traffic safety manual for statewide use, under direction of the Southeast Michigan Council of Governments and sponsorship of Michigan's Office of Highway Safety Planning.
- ♦ Consulted nationally in crash litigation involving alleged personal and highway tort liability. Investigated crashes involving grade crossings, curves, trucks, pedestrians, and poor weather.
- ♦ Conducted and evaluated several traffic impact studies.

1993 to 1995 A/E GROUP, INC. – McLean, Virginia, Program Manager,
Federal Highway Administration Geometric Design Lab

- ♦ Set up and managed national lab to coordinate development of Interactive Highway Safety Design Model, a suite of CAD-interactive software for visualizing and assessing the safety of prospective highway designs.
- ♦ Edited research reports, set up studies on curve speeds and roadway design consistency, evaluated research proposals for driver performance model, and wrote paper on vehicle dynamics modeling.
- ♦ Organized and chaired national workshop on accident analysis methods. Also reviewed 250 police accident reports in search of causal factors.

1991 to 1993 ADA COUNTY HIGHWAY DISTRICT – Boise, Idaho
Traffic Engineering Supervisor

- ◆ Evaluated warrants for – and specified design and placement of – new signs, signals, and markings on ACHD’s 1,500 miles of city streets and county roads.
- ◆ Oversaw design, construction, and/or operation of traffic signals at 260 intersections.
- ◆ Conceived and directed special traffic engineering and safety studies.
- ◆ Participated in conceptual planning and public-meeting review of all capital improvements.
- ◆ Evaluated traffic safety of all construction plans for intersections, roadways, and bridges.
- ◆ Approved traffic control plans for all significant road-related construction and maintenance.
- ◆ Evaluated traffic impacts of proposed land developments, and specified needed roadway and traffic control improvements.
- ◆ Analyzed traffic planning issues, such as downtown circulation and parking, new route and intersection alternatives, and regional pathways.

1987 to 1991 WILLIAM A. STIMPSON, P.E. – Rochester Hills, Michigan
Self-Employed Consultant

- ◆ As Ford Motor Company’s Proving Ground Safety Consultant in 1990, reviewed all aspects of driving safety at the company’s four domestic proving grounds. Recommended new traffic control devices and numerous roadside safety improvements.
- ◆ Consulted in accident litigation, investigating crashes involving a construction zone, winter conditions, grade crossings, intersection sight distance, curves, and obstacle visibility. Also analyzed mass crash data, looking for evidence of vehicle design and operational problems.
- ◆ Established relationship between driver age and frequency of vehicle rollover crashes.
- ◆ Conducted several traffic impact studies and developed site plans for two shopping centers.

1979 to 1986 GENERAL MOTORS RESEARCH LABORATORIES – Warren, Michigan,
Senior Research Engineer

- ◆ Researched crash causation, traffic signal coordination, in-vehicle navigation, and freight transportation.
- ◆ Used mass accident data to determine heavy-truck accident involvement trends, and to detect statistically different safety effects of alternative automobile bumper standards.
- ◆ Demonstrated through in-traffic measurements that re-timing and coordinating a network of vehicle-actuated traffic signals can reduce fuel use by as much as 15%.
- ◆ Established, for users of an in-vehicle navigation system, a relationship between excess travel and road network familiarity.
- ◆ Helped develop concept initially referred to as a “cooperative highway,” where in-vehicle navigation, cellular communications, and computerized traffic control might improve travel efficiency and safety (a precursor to Intelligent Transportation Systems, or ITS).
- ◆ Developed analytic procedure for trading off receiving dock inventory and unloading costs.
- ◆ Helped develop, test, and implement a new production scheduling method proven to reduce finished vehicle logistics costs by as much as \$1 million per year per assembly plant.

1974 to 1979 ALAN M. VOORHEES & ASSOCIATES – McLean, Virginia
Associate Engineer

- ◆ Managed and participated in studies of driver response to traffic control devices under various roadway design and environmental conditions; heavy truck safety; traffic operations; and parking.
- ◆ Directed development of accident-probability model based on traffic performance, and used model to evaluate alternative road delineation systems. Research led to new national standard for broken-line striping.
- ◆ Directed study of driver response to alternative durations of the yellow traffic signal.
- ◆ Assisted in comprehensive research study leading to national policy for right-turn-on-red.
- ◆ Evaluated benefits and costs of methods for alleviating adverse aerodynamic effects of large trucks.
- ◆ Compiled and analyzed data on 600 downgrade truck accidents.
- ◆ Directed comprehensive study of fringe parking lots for carpoolers at 150 lots in four states.

- ◆ Estimated cost-effectiveness of area-wide express bus service.
- ◆ Contributed to development of U.S. Capitol Hill Master Plan.
- ◆ Evaluated traffic circulation, traffic impact, parking, and signal timing optimization.

1972 to 1974 NATIONAL MILITARY COMMAND SYSTEM SUPPORT CENTER – The Pentagon,
Transportation Analyst

- ◆ Worked as a junior Army officer in the NMCSSC, an arm of the Defense Communications Agency providing systems analysis support to the Organization of the Joint Chiefs of Staff.
- ◆ Developed multi-modal transportation data bases for foreign theaters of operation.
- ◆ Consulted with senior officers of OJCS on intra-theater strategic mobility modeling needs, and directed revisions to a large multi-modal transportation simulation model.

1970 to 1971 TEXAS TRANSPORTATION INSTITUTE, Texas A&M University, College Station, Texas,
Research Assistant

- ◆ Researched Highway Visual Communications Systems within TTI's Driving Environment Program.
- ◆ Synthesized findings of diagnostic field studies of driver behavior and performance, and used findings to recommend improved roadway design and traffic control practices.
- ◆ With a research psychologist, co-authored detailed "Driver Expectancy Checklist" for roadway design (condensed checklist later published by American Association of State Highway Officials, nka as AASHTO).
- ◆ Helped conduct daytime and nighttime sign legibility tests.

EDUCATION

B.S.E. Civil Engineering, University of Michigan
Dean's Honor List, College of Engineering; top 1/3 of civil engineering graduating class

M.Eng. Civil Engineering, Texas A&M University
Top 10% of graduating class; Elected to Chi Epsilon, 1970, and Phi Kappa Phi, 1972

U.S. Army Transportation School – Diploma, Transportation Officer Basic Course
Familiarization with all transportation modes; top 10% of graduating class

PROFESSIONAL REGISTRATION AND AFFILIATIONS

REGISTRATION

Professional Engineer (P.E.) – State of Michigan, No. 27420 (since 1980)

AFFILIATIONS

Institute of Transportation Engineers (ITE), Fellow (since 1994) & Life Member (effective January 2013)

ITE, Member, Transportation Forensics and Risk Management Council (fka Expert Witness Council)

PUBLICATIONS AND NON-PROPRIETARY MAJOR REPORTS

1. "Crash-Data-Assisted Safety Evaluation of 12 Intersections in City of Novi." Prepared for City of Novi, Jun 2012.
2. "Identification of High-Crash Intersections in the City of Novi, 2006-2010." Prepared for City of Novi, Jan 2012.
3. "Aguirre v. Delta Sonic." Prepared for Packer Engineering, Inc. & Delta Sonic Car Wash Systems, Inc., Mar 2010.
4. "Evaluation of Cronin / Greene Motorcycle Crash at Intersection of Western Avenue and 63rd Street in City of Chicago." Prepared for Packer Engineering, Inc. & City of Chicago, Dec 2009.
5. "An Evaluation of Golf Cart Utilization for Burnham Harbor Security Patrols." Prepared for Packer Engineering, Inc. & Hector Espitia, Esq., Nov 2009.

6. "An Evaluation of Driver, Vehicle, and Roadway Causal Factors in the Matter of Kachel v. Hetrick, et al. v. PennDOT." Prepared in association with Engineering Analysis Associates, Inc., Jul 2000.
7. "Bridge Management Data for Southeast Michigan." Prepared for Southeast Michigan Council of Governments by William A. Stimpson, P.E., Jun 1996.
8. "SEMCOG Traffic Safety Manual – First Edition." Prepared for Southeast Michigan Council of Governments by William A. Stimpson, P.E., Feb 1996.
9. Workshop on Development of the Interactive Highway Safety Design Model (IHSDM) Accident Analysis Module," co-authored with D.W. Harwood, K.M. Bauer, and J. M. Mason. Prepared for Federal Highway Administration (FHWA) by Midwest Research Institute, Nov 1995.
10. "Influence of Vehicle Dynamics on Geometric Design," co-authored with J.A. Reagan. Presented at the Transportation Research Board's (First) International Symposium on Highway Design Practices, Boston, Massachusetts, Aug 1995.
11. "Technical Summary: Horizontal Alignment Design Consistency for Rural Two-Lane Highways (Publication No. FHWA-RD-94-034, Jan 1995)." Pub. No. FHWA-RD-130. Prepared for FHWA by A/E Group, Inc., Jan 1995.
12. "The Special Intersection Study: A Public/Private Partnership to Expand System Capacity in Concert with Land Development Needs." Presented at Annual Meeting of the Intermountain Section of the Institute of Transportation Engineers, Jackson Hole, Wyoming, May 1993.
13. "Rollover Accident Frequency and Driver Age." Unpublished paper, Jun 1987.
14. "Co-ordinating Vehicle-Actuated Traffic Signals to Reduce Vehicular Fuel Consumption," co-authored by G.M. Takasaki. Traffic Engineering & Control, Vol. 23, No. 10, Oct 1982.
15. "The Influence of the Time Duration of Yellow Traffic Signals on Driver Response," co-authored by P.L. Zador and P. J. Tarnoff. ITE Journal, Nov 1980.
16. "Corridor Parking Facilities for Carpoolers," co-authored with J. W. Flora and J. R. Wroble. Final Report on Contract DOT-FH-11-9463. Prepared for FHWA by Alan M. Voorhees & Associates, Jun 1980.
17. "Methodologies for Evaluating TSM Actions in Bombay." Working paper prepared for municipality of Bombay, India, under World Bank-sponsored study conducted by Alan M. Voorhees & Associates, Apr 1979.
18. "Downgrade Truck Accidents and Their Prevention," co-authored by D.T. Gallagher. Prepared for Systems Technology, Inc. & Federal Highway Administration by Alan M. Voorhees & Associates, Jan 1979.
19. "Impact of Park-and-Ride and Express Bus Improvements." Chapter C of Transportation System Management: an Assessment of Impacts. Prepared for Urban Mass Transportation Administration under contract UMTA-VA-06-0047 by Alan M. Voorhees & Associates, Nov 1978.
20. "A Cost-Effectiveness Evaluation of Devices for Reducing the Adverse Aerodynamic Effects of Large Trucks," co-authored by S.R. Shapiro. Prepared for Systems Technology, Inc. & Federal Highway Administration by Alan M. Voorhees & Associates, Aug 1978.
21. "The Traffic Safety Effectiveness of Selected Delineation Treatments Applied to Two-Lane Rural Highways." Winner of Honorable Mention in Past Presidents' Award competition, Institute of Transportation Engineers, Aug 1978.
22. "Study of the Effectiveness of Lane Markings for Traffic Safety," co-authored with M.L. Altman. Prepared for Illinois Department of Transportation by Alan M. Voorhees & Associates, Apr 1978.

23. "Field Evaluation of Selected Delineation Treatments on Two-Lane Rural Highways," co-authored by H.W. McGee, W.K. Kittelson, and R.H. Ruddy. Report Nos. FHWA-RD-77-118, 119. Prepared for Federal Highway Administration by Alan M. Voorhees & Associates, Oct 1977.
24. "Predicting the Traffic Safety Effects of Alternative Roadway Delineation Treatments," co-authored by W.K. Kittelson. AMV Tech Notes, Alan. M. Voorhees & Associates, Mar 1977.
25. "Methods for Field Evaluation of Roadway Delineation Treatments," co-authored by W.K. Kittelson and W.D. Berg. Transportation Research Record 630, 1977.
26. "Right-Turn-On-Red," Vols. I and II, co-authored with H.W. McGee, J. Cohen, G.F. King, and R.F. Morris. Report Nos. FHWA-RD-76-89, 90. Prepared for Federal Highway Admin. by Alan M. Voorhees & Associates, May 1976.
27. "The Effects of Larger Trucks on Highway Operations and Design," co-authored with C.R. Keller. AMV Tech Notes, Alan M. Voorhees & Associates, Sep 1975.
28. "Data Base Development for the Transportation Requirements and Capabilities Simulator Model (TRACS)." National Military Command System Support Center, Nov 1974.
29. "TRACS: A Computer Model of Intra-theater Strategic Mobility," co-authored by B.D. Nussbaum. Presented at 44th National Meeting of Operations Research Society of America, San Diego, California, Nov 1973.
30. "Three Schemes for Improved Line-Haul Bus Rapid Transit." Traffic Engineering, Feb 1973.
31. "Driver Expectancy Checklist – A Design Review Tool," co-authored by N.C. Ellis. Prepared by Texas Transportation Institute and published by American Association of State Highway Officials, 1972.
32. "A New Warning Sign." TexITE, Vol. XVIII, No. 1, Sep 1971.
33. "A Critical Review of Climbing Lane Design Practices," co-authored by J.C. Glennon. Highway Research Record 371, 1971.
34. "Highway Engineering Tips." Prepared for Multi-State Policy Committee of Project HPR-2(108), Diagnostic Studies of Highway Visual Communication Systems. Prepared by Texas Transportation Institute, 1970.

OTHER HONORS

- Honorable Mention, Institute of Transportation Engineers Past Presidents' Award, 1978
- Defense Communications Agency Certificate of Achievement, 1974

MILITARY SERVICE

- 2LT, US Army Reserve, 1970-1973, and 1LT, US Army Reserve, 1973-1976
- Active duty in the Pentagon, 1972-1974 (see Experience section, above)

SELECTED SHORT COURSES

- SIMSCRIPT II.5 computer simulation language
- Computerized control of traffic signals
- Applied multivariate analysis (Princeton University)
- Highway Capacity Software 2000
- Roundabout design, operation, and analysis (M. Wallwork)
- Access Management Guidebook – Train the Trainer (MDOT)
- Syncho 6 / SimTraffic software
- Designing Pedestrian Facilities for Accessibility
- ADA Standards for Accessible Design

Last updated: March 2017

APPENDIX B:
SIGNAL TIMING PERMIT

OAKLAND COUNTY ROAD COMMISSION
TRAFFIC - SAFETY DEPARTMENT
SIGNAL WORK ORDER

LOCATION: Coolidge & Harvard DATE: 10-16-15
 CITY/TOWNSHIP: Berkeley BY: T. Creech
 COUNTY#: 307 STATE#: — CHARGES: 50741-0981

PLEASE PERFORM THE FOLLOWING:

ROAD COMMISSION FOR
OAKLAND COUNTY

ELECTRICAL DEVICE: INSTALL MODERNIZE MAINTENANCE

NOV 30 2015

UNDERGROUND:

EDISON OK: YES NO

JOB#: _____

TRAFFIC OPERATIONS

COORDINATE W/DISTRICT 7: _____

DIAL..	1	1	1	1		2	2	2	2		3	3	3	3		4	4	4	4
SPLIT.	1	2	3	4		1	2	3	4		1	2	3	4		1	2	3	4
<input type="checkbox"/> CHANGE TIMING.....																			
<input type="checkbox"/> CHANGE OFFSET.....																			
<input type="checkbox"/> CHANGE CYCLE LENGTH.....																			
<input type="checkbox"/> ADD DIAL/SPLIT.....																			

CHANGE BREAKOUT OR EPROM: Change Pers → 10-16-15

CHANGE HOURS OF OPERATION: (flexi, ECO, Ped times, schedule)

OLD: _____

NEW: _____

REPROGRAM TBC


INSTALL INTERCONNECT: TBC MINITROL TONE

MBT OK: YES NO

NO CHANGE - RECORD CORRECTION

OTHER: _____

(2011 Retiring)

APPROVED BY: 

DATE: 10/30/15

DATE INSTALLED: 11-18-15

INSTALLED BY: Jordan + Roberts

INTERSECTION :- 307 COOLIDGE & HARVARD
DESCRIPTION PROMS :- X00307D / F2202
CONTROLLER TYPE :- STANDARD PERSONALITY CONTROLLER

INPUTS :-

- | | |
|---------------------|-----------------------------------|
| 1. WB HARVARD PRES | 17. - NOTE: JUMPER INPUTS 1,2,3,4 |
| 2. SB COOLIDGE PRES | 18. - & 26 TO LOGIC COMMON. |
| 3. EB HARVARD PRES | 19. - |
| 4. NB COOLIDGE PRES | 20. - |
| 5. - | 21. - |
| 6. - | 22. - |
| 7. - | 23. - |
| 8. - | 24. - |
| 9. - | 25. - |
| 10. - | 26. HARVARD PED P.B. |
| 11. - | 27. - |
| 12. - | 28. - |
| 13. - | 29. - |
| 14. - | 30. - |
| 15. - | 31. - |
| 16. - | 32. - |

APPROACHES :-

A APPR 1 : SB COOLIDGE	A APPR 2 : NB COOLIDGE
B APPR 1 : WB HARVARD	B APPR 2 : EB HARVARD

FLEXIDATA :-

SEQUENCE A,B A,B
AUTO REL
R- REL
R+ REL
Q- REL
Q+ REL
LOOKAHEAD

PEDESTRIANS :-

1. COOLIDGE PED
2. HARVARD PED (P+-)

SPECIAL FEATURES :-

Ped COOLIDGE PED is walk for green in A stage and is secret under masterlink.
Ped COOLIDGE PED has automatic introduction in A stage.
Ped HARVARD PED is terminated by QNEG pulse under Flexilink.
The personality revision number is currently 1 (=A).

EAGLE 4 PHASE BACK PANEL

LOADSWITCH 1: COOLIDGE	V1	A&C	FLA
LOADSWITCH 2: HARVARD	V2	B&D	FLR
LOADSWITCH 7: HARVARD PED	P2		
LOADSWITCH 8: COOLIDGE PED	P1		

JUMPERS: 145-146,147-148,149-150,151-152,153-154,155-156,157-224,
163-230,179-202,185-208,233-234,235-236,237-PB1,241-PB1,
247-273,251-269,255-256,257-258,259-PB1,263-PB1.

CONFLICT MONITOR JUMPERS: NONE

* CONTROLLER INFORMATION SHEET *
* FOR SITE NO. 307 *
* Terry Creech *
* DATE :- 16-OCT-2015 *

Checksums Times E4 / 344
Pers 0C / 014
Total E8 / 350

FLEXILINK PLAN DATA

Intersection # 307 **State #** _____ **Date:** 10/16/15 **Prepared By:** Terry Creech
Intersection: Coolidge & Harvard **City:** Berkley
Flash: None **Approved By:** Rachel Jones

		PL0	PL1	PL2	PL3	PL4	PL5	PL6	PL7	PL8
0	CL		90	90	90					
1	A		0	0	0					
2	B		60	60	60					
3	C									
4	D									
5	E									
6	F									
7	G									
8	R-									
9	R+									
10	Of (Y-)		87	87	87					
11	Y+	C								
12	Z-									
13	Z+									
14	Q-		78	78	78					
15	Q+									
16	XH									
17	XL									

NOTE: STAGES WITH ONE SECOND PHASE TIMES ARE SKIPPED
 BLANK ENTRIES ARE DEFAULT VALUES = 0 FOR ENTRIES #0 - #7, #16 - #17
 254 FOR ENTRIES #8 - #15 'C' ENTRY MEANS CONTINUOUS = 255

Phase	Direction	Min	Max	ECO	Amber	All Red	Timers		
							Gap	Hdwy	Waste
A	Coolidge	10.0	47.0	4.0	3.5	1.6	3.0	1.2	10.0
B	Harvard	5.0	33.0		3.5	2.5	3.0	1.2	10.0
C									
D									
E									
F									
G									

	Day	Hours	Plan#
SC1	14	0:00	1
SC2	8	6:00	2
SC3	8	9:00	1
SC4	8	15:00	3
SC5	8	19:00	1
SC6			
SC7			
SC8			
SC9			
SC10			

Pedestrian Crossing Times

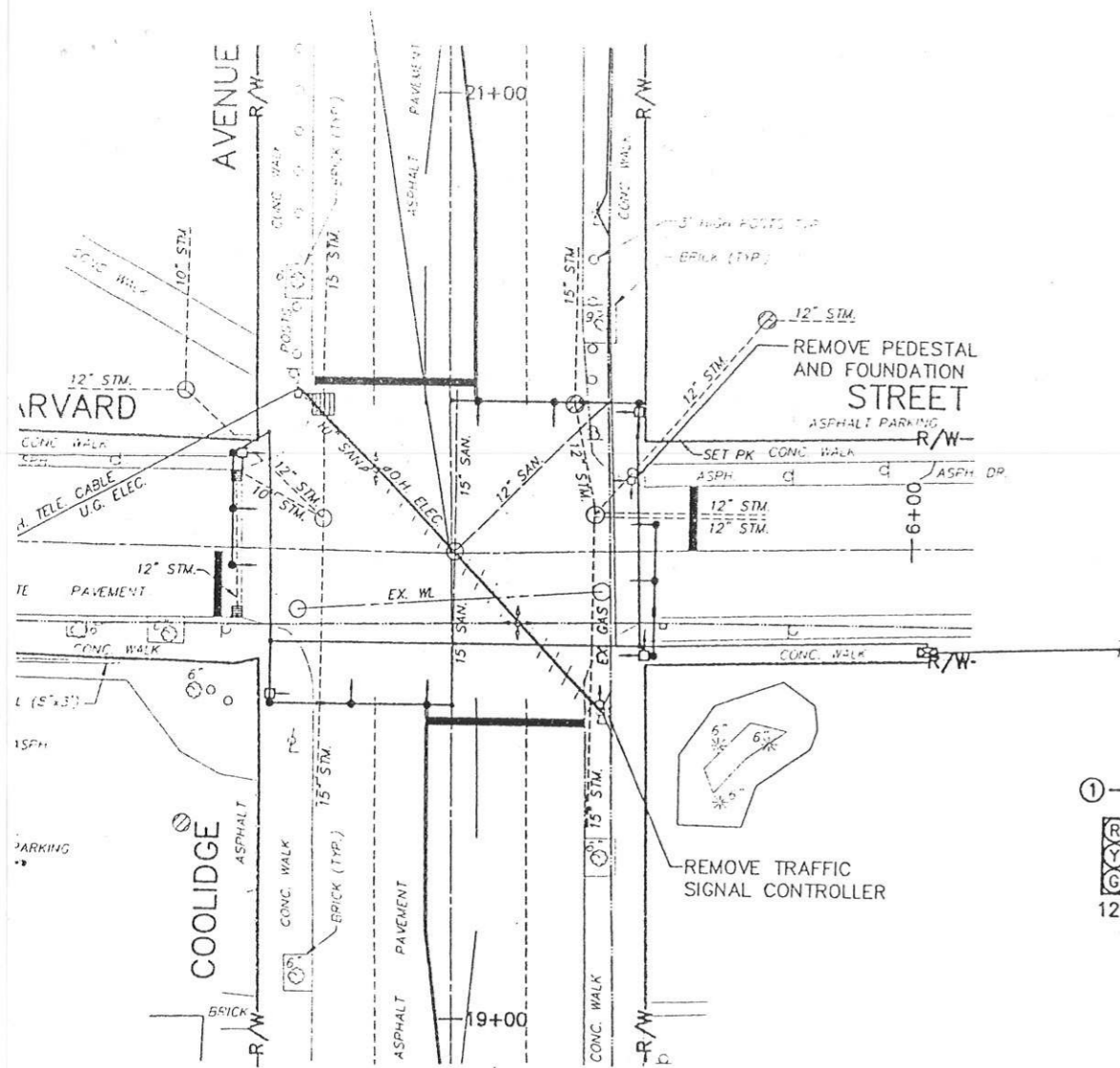
Direction	Walk	CL 1	CL 2
Coolidge	7.0	4.0	2.1
Harvard	7.0	12.0	3.0

Normal Operating Mode

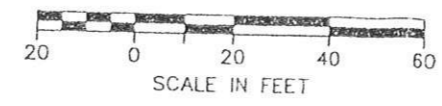
Isolated	Flexilink	Masterlink	Master Isolated	Flexi Isolated
	X			

DAY OF WEEK CODE NUMBER

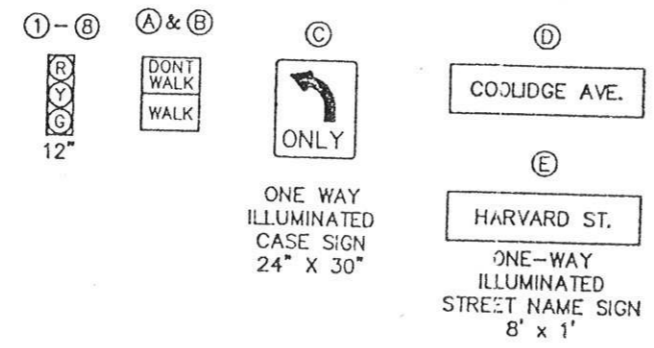
0	End of Schedule	4	WED	8	MON-FRI	12	MON,FRI,SAT
1	SUN	5	THUR	9	MON-SAT	13	SAT,SUN
2	MON	6	FRI	10	TUE,WED,THU	14	EVERY DAY
3	TUE	7	SAT	11	MON,FRI	15	NEVER



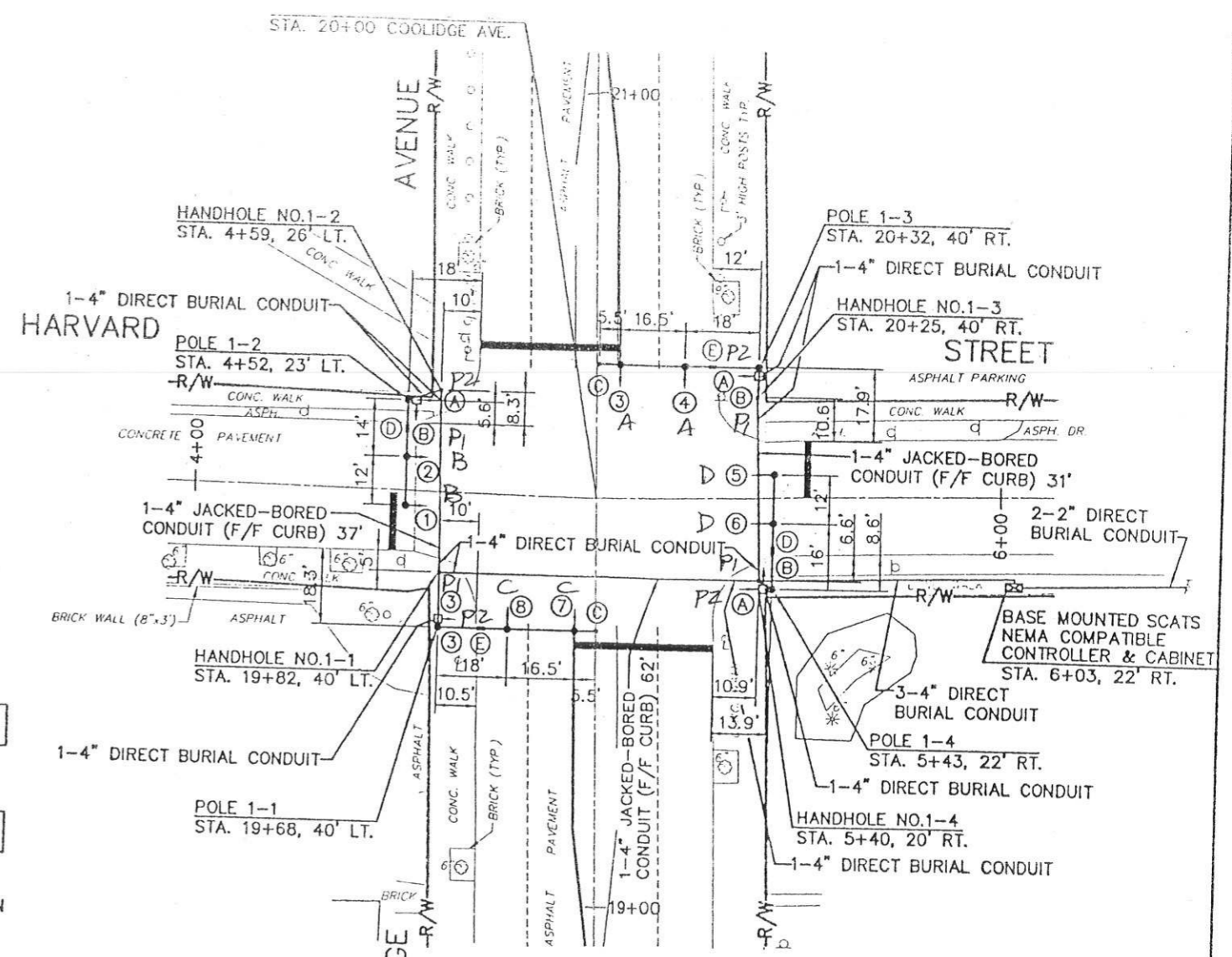
REMOVAL PLAN



NOTE: STATIONS ARE NOT CONTINUOUS FROM INTERSECTION TO INTERSECTION.



SIGNAL INDICATIONS



SIGNAL PLAN

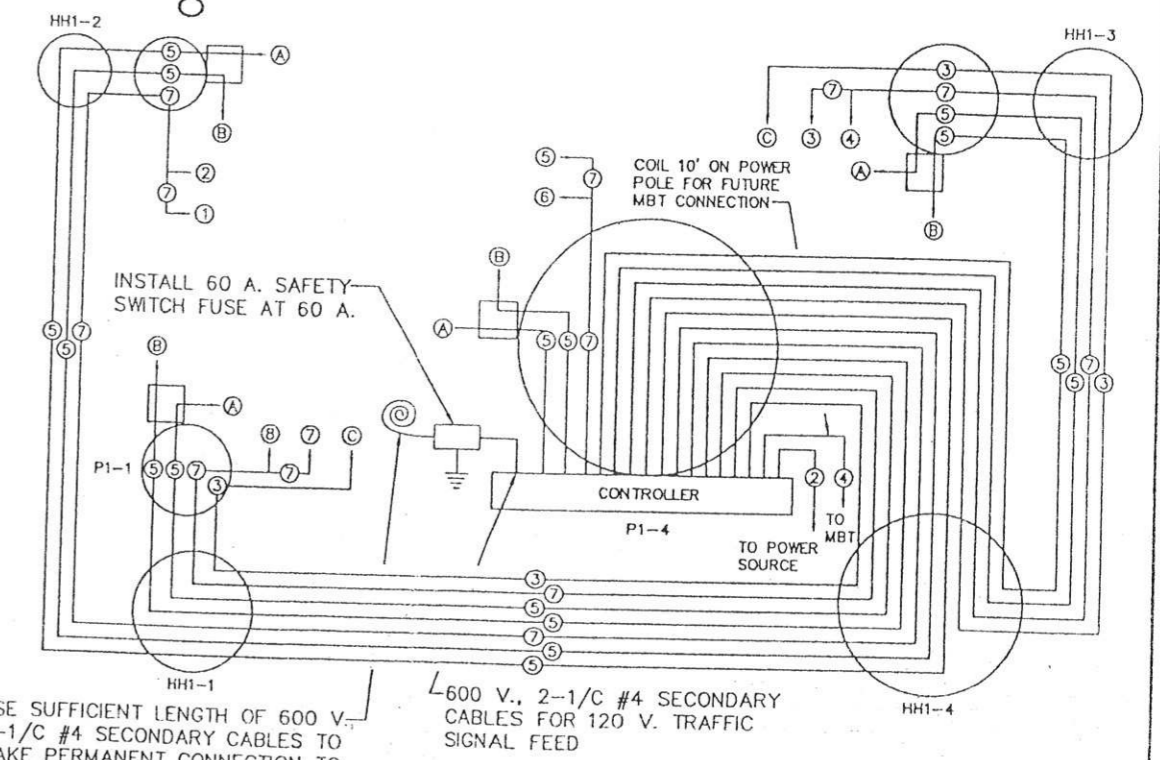
CO # 307

LIST OF MATERIALS			
DESCRIPTION	QUANTITY	UNIT	
REMOVE SIDEWALK	65	SYD.	
CONCRETE SIDEWALK 4"	585	SFT.	
REMOVE FOUNDATION	4	EA.	
DIRECT BURIAL CONDUIT 2-2"	35	LFT.	
LUMINAIRE	2	EA.	
DIRECT BURIAL CONDUIT 1-4"	32	LFT.	
DIRECT BURIAL CONDUIT 3-4"	60	LFT.	
REMOVE CONTROLLER AND CABINET	1	EA.	
REMOVE SPAN WIRE MOUNTED TRAFFIC SIGNAL	2	EA.	
REMOVE BRACKET ARM MOUNTED PEDESTRIAN TRAFFIC SIGNAL	2	EA.	
REMOVE PEDESTAL MOUNTED PEDESTRIAN TRAFFIC SIGNAL	2	EA.	
REMOVE SPAN WIRE	1	EA.	
REMOVE PEDESTAL	2	EA.	
2-WAY BRACKET ARM MOUNTED PEDESTRIAN TRAFFIC SIGNAL	4	EA.	
1-WAY MAST ARM MOUNTED TRAFFIC SIGNAL	8	EA.	
HANDHOLE (ROUND)	4	EA.	
MAST ARM STANDARD	4	EA.	
MAST ARM STANDARD FOUNDATION	4	EA.	
BASE MOUNT CONTROLLER FOUNDATION	1	EA.	
SAFETY SWITCH	1	EA.	
JACKED-BORED CONDUIT 1-4"	128	LFT.	
MAST ARM, 28'	1	EA.	
MAST ARM, 30'	1	EA.	
MAST ARM, 40'	2	EA.	
ONE-WAY INTERNALLY ILLUMINATED CASE SIGN, 24" X 30"	2	EA.	
ONE-WAY ILLUMINATED STREET NAME SIGN, 8' X 1'	4	EA.	
CABINET (4 PHASE NEMA)	1	EA.	

FOR REMOVAL OF ELECTRICAL EQUIPMENT AND HOOK-UP OF ELECTRICAL SERVICE CONTACT ROBERT JONES, DETROIT EDISON (1-313-645-4395). ESTIMATED COST TO CONTRACTOR WILL BE 7/8 922.00.

FOR ELECTRICAL SERVICE INSPECTION CONTACT THE MICHIGAN DEPARTMENT OF LABOR AT (1-313-234-4644). ESTIMATED COST TO CONTRACTOR WILL BE 7/8 40.00

- LEGEND
- ② POWER CABLE, 3 CONDUCTOR #8 AWG.
 - ③ 3 CONDUCTOR, #12 AWG. SIGNAL CABLE
 - ④ 2 CONDUCTOR, #14 AWG. SHIELDED SIGNAL CABLE
 - ⑤ 5 CONDUCTOR, #14 AWG. SIGNAL CABLE
 - ⑦ 7 CONDUCTOR, #14 AWG. SIGNAL CABLE



WIRING DIAGRAM

APPENDIX C:
TRAFFIC COUNTS

Table C-1. Annual Average Daily Traffic (AADT) Volumes on Coolidge, per SEMCOG

TRAFFIC COUNTS -

Southeast Michigan

Road Name

Search Now

DOWNLOAD RESULTS (.CSV)

Road Name	Dir.	Limits	Community	Year	AADT
Coolidge Hwy	NB	0.4 Mile N Of 13 Mile (In Royal Oak)	Royal Oak	2016	<u>13,117</u>
Coolidge Hwy	SB	0.4 Mile N Of 13 Mile (In Royal Oak)	Royal Oak	2016	<u>12,739</u>
Coolidge Hwy	2-WAY	8 Mile Rd (M-102) To 9 Mile Rd	Oak Park	2015	<u>21,410</u>
Coolidge Hwy	2-WAY	0.25 Mile S Of M-1 Woodward (In Royal Oak)	Royal Oak	2015	<u>12,935</u>
Coolidge Hwy	NEB	0.25 Mile S Of M-1 Woodward (In Royal Oak)	Royal Oak	2013	<u>6,228</u>
Coolidge Hwy	SWB	0.25 Mile S Of M-1 Woodward (In Royal Oak)	Royal Oak	2013	<u>6,332</u>

Volume Count Report

LOCATION INFO	
Location ID	4159
Type	SPOT
Funct'l Class	-
Located On	COOLIDGE
AT	12 Mile
Direction	NB
County	Oakland
Community	Royal Oak
MPO ID	5558
HPMS ID	
Agency	Oakland County

INTERVAL:60-MIN	
Time	Hourly Count
0:00-1:00	36
1:00-2:00	22
2:00-3:00	12
3:00-4:00	14
4:00-5:00	20
5:00-6:00	67
6:00-7:00	200
7:00-8:00	423
8:00-9:00	515
9:00-10:00	489
10:00-11:00	419
11:00-12:00	540
12:00-13:00	534
13:00-14:00	542
14:00-15:00	561
15:00-16:00	599
16:00-17:00	731
17:00-18:00	796
18:00-19:00	620
19:00-20:00	424
20:00-21:00	306
21:00-22:00	254
22:00-23:00	152
23:00-24:00	58
Total	8,334
AADT	
AM Peak	11:00-12:00 540
PM Peak	17:00-18:00 796

$K_{PM} = 0.0955 >$

COUNT DATA INFO	
Count Status	Accepted
Start Date	Tue 6/16/2015
End Date	Wed 6/17/2015
Start Time	12:00:00 PM
End Time	12:00:00 PM
Direction	
Notes	
Station	FO389
Study	
Speed Limit	
Description	
Sensor Type	

Count Navigation: << < > >> Count Type: VOLUME

Directions: NB

- [View Calendar](#)
- [View in Excel](#)
- [Bar Graph](#)
- [Line Graph](#)
- [Weekly Report](#)
- [Compare Count](#)

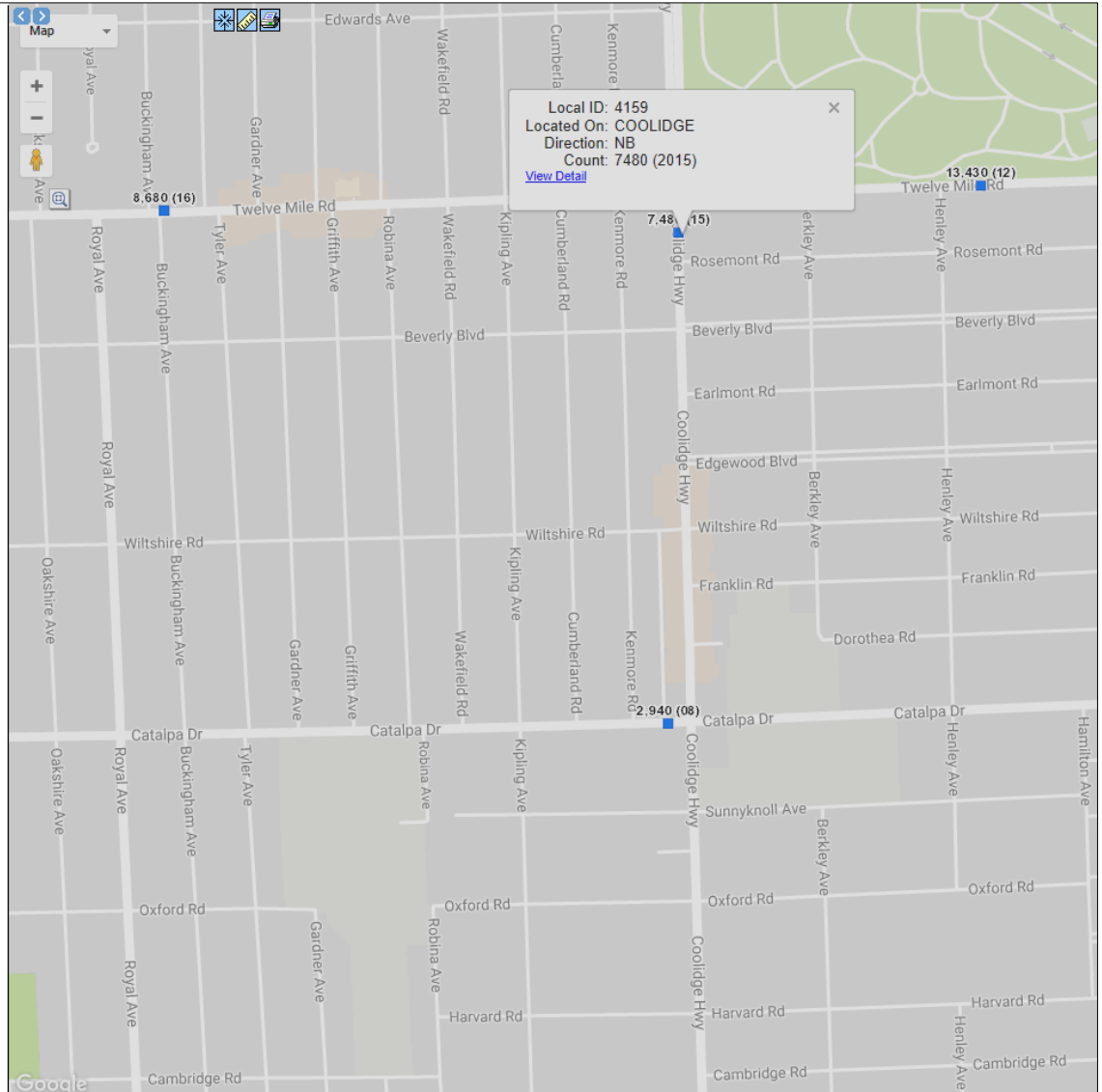


Figure C-1. Hourly Volumes on NB Coolidge Approach to 12 Mile Road (June 2015)

Monthly Calendar

July 2017						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
11:30 AM Sunday Mass		Mass	07:00 PM Weekday Mass			
9 09:30 AM Sunday Mass 11:30 AM Sunday Mass	10 08:45 AM Communion Service 07:00 PM Holy Hour	11 08:45 AM Weekday Mass	12 01:15 PM Pastoral Team Meeting - Cancelled 07:00 PM Weekday Mass	13 08:45 AM Weekday Mass 07:00 PM Parish Finance Council	14 08:45 AM Weekday Mass	15 05:00 PM Vigil Mass for Sunday
16 09:30 AM Sunday Mass 11:30 AM Sunday Mass 01:00 PM Baptism/Mia Espinoza	17 08:45 AM Communion Service	18 08:45 AM Weekday Mass Traffic counts on Coolidge done this day.	19 01:15 PM Pastoral Team Meeting 07:00 PM Weekday Mass	20 08:45 AM Weekday Mass	21 08:45 AM Weekday Mass	22 11:00 AM Funeral: Zachary Fritsch 05:00 PM Vigil Mass for Sunday
23 09:30 AM Sunday Mass 11:30 AM Sunday Mass	24 08:45 AM Communion Service	25 08:45 AM Weekday Mass	26 01:15 PM Pastoral Team Meeting 07:00 PM Weekday Mass Counts on Kipling done this day.	27 08:45 AM Weekday Mass	28 08:45 AM Weekday Mass 11:00 AM Funeral: Anna Hodge	29 05:00 PM Vigil Mass for Sunday
30 09:30 AM Sunday Mass 11:30 AM Sunday	31 08:45 AM Communion Service	Aug 01 08:45 AM Weekday Mass	Aug 02 01:15 PM Pastoral Team Meeting 07:00 PM Weekday	Aug 03 08:45 AM Weekday Mass	Aug 04 08:45 AM Weekday Mass	Aug 05 05:00 PM Vigil Mass for Sunday

Figure C-2. Our Lady of La Salette Church Calendar, Early July-Early August, 2017

Traffic Data Collection, LLC

tdccounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

Giffels Webster



Project: Berkley Traffic Impact Study
Type: 4 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. PM Deg's 80's
Count By: Miovision Video VCU 4G2

File Name : TMC_1 Coolidge & Oxford_7-18-17
Site Code : TMC_1
Start Date : 7/18/2017
Page No : 1

Groups Printed- Pass Cars - Single Units - Heavy Trucks - Peds

Start Time	Coolidge Hwy. Southbound					Oxford Street Westbound					Coolidge Hwy. Northbound					Oxford Street Eastbound					Int. Total
	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	
07:00 AM	0	113	1	0	114	2	0	1	0	3	2	114	1	0	117	4	1	4	0	9	243
07:15 AM	0	126	0	0	126	0	0	0	2	2	3	108	0	0	111	2	0	2	0	4	243
07:30 AM	3	157	1	0	161	4	0	1	1	6	1	162	0	1	164	3	0	1	0	4	335
07:45 AM	3	217	2	0	222	2	0	4	0	6	2	156	2	0	160	3	0	4	0	7	395
Total	6	613	4	0	623	8	0	6	3	17	8	540	3	1	552	12	1	11	0	24	1216
08:00 AM	3	189	1	0	193	4	0	3	0	7	3	172	1	0	176	3	0	0	1	4	380
08:15 AM	3	181	2	0	186	3	1	7	0	11	3	186	4	0	193	2	0	0	0	2	392
08:30 AM	0	181	6	0	187	4	1	4	0	9	2	189	2	1	194	2	1	0	1	4	394
08:45 AM	0	172	2	0	174	5	1	2	3	11	4	183	0	0	187	6	0	1	0	7	379
Total	6	723	11	0	740	16	3	16	3	38	12	730	7	1	750	13	1	1	2	17	1545
**** BREAK ****																					
04:00 PM	2	210	4	0	216	4	1	1	3	9	4	204	2	0	210	2	0	1	1	4	439
04:15 PM	2	233	3	0	238	6	0	3	0	9	2	232	3	0	237	2	0	2	0	4	488
04:30 PM	0	223	4	0	227	4	0	11	1	16	10	260	3	0	273	0	0	0	6	6	522
04:45 PM	7	241	4	0	252	9	0	3	4	16	5	263	2	0	270	2	0	1	2	5	543
Total	11	907	15	0	933	23	1	18	8	50	21	959	10	0	990	6	0	4	9	19	1992
05:00 PM	4	264	4	0	272	4	0	3	0	7	4	294	3	0	301	6	0	1	2	9	589
05:15 PM	3	231	4	0	238	4	0	2	2	8	4	314	2	0	320	0	2	0	1	3	569
05:30 PM	3	245	3	1	252	3	0	2	0	5	11	311	2	0	324	3	0	1	0	4	585
05:45 PM	2	254	3	0	259	5	0	2	0	7	3	292	1	0	296	5	0	1	1	7	569
Total	12	994	14	1	1021	16	0	9	2	27	22	1211	8	0	1241	14	2	3	4	23	2312
Grand Total	35	3237	44	1	3317	63	4	49	16	132	63	3440	28	2	3533	45	4	19	15	83	7065
Apprch %	1.1	97.6	1.3	0		47.7	3	37.1	12.1		1.8	97.4	0.8	0.1		54.2	4.8	22.9	18.1		
Total %	0.5	45.8	0.6	0	46.9	0.9	0.1	0.7	0.2	1.9	0.9	48.7	0.4	0	50	0.6	0.1	0.3	0.2	1.2	
Pass Cars	35	3178	44	0	3257	58	4	46	0	108	57	3401	28	0	3486	45	4	19	0	68	6919
% Pass Cars	100	98.2	100	0	98.2	92.1	100	93.9	0	81.8	90.5	98.9	100	0	98.7	100	100	100	0	81.9	97.9
Single Units	0	50	0	0	50	5	0	2	0	7	6	34	0	0	40	0	0	0	0	0	97
% Single Units	0	1.5	0	0	1.5	7.9	0	4.1	0	5.3	9.5	1	0	0	1.1	0	0	0	0	0	1.4
Heavy Trucks	0	9	0	0	9	0	0	1	0	1	0	5	0	0	5	0	0	0	0	0	15
% Heavy Trucks	0	0.3	0	0	0.3	0	0	2	0	0.8	0	0.1	0	0	0.1	0	0	0	0	0	0.2
Peds	0	0	0	1	1	0	0	0	16	16	0	0	0	2	2	0	0	0	15	15	34
% Peds	0	0	0	100	0	0	0	0	100	12.1	0	0	0	100	0.1	0	0	0	100	18.1	0.5

Comments: 4 Hour video intersection turning movement traffic study conducted during typical weekday (Tuesday) from 7:00-9:00 AM morning & 4:00-6:00 PM afternoon peak hours, while school was not in session. Non-signalized intersection, Oxford Street is stop controlled for Coolidge Hwy. VCU video camera was located within SE intersection quadrant.

Traffic Data Collection, LLC

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Phone: (586) 786-5407

Traffic Study Performed For:

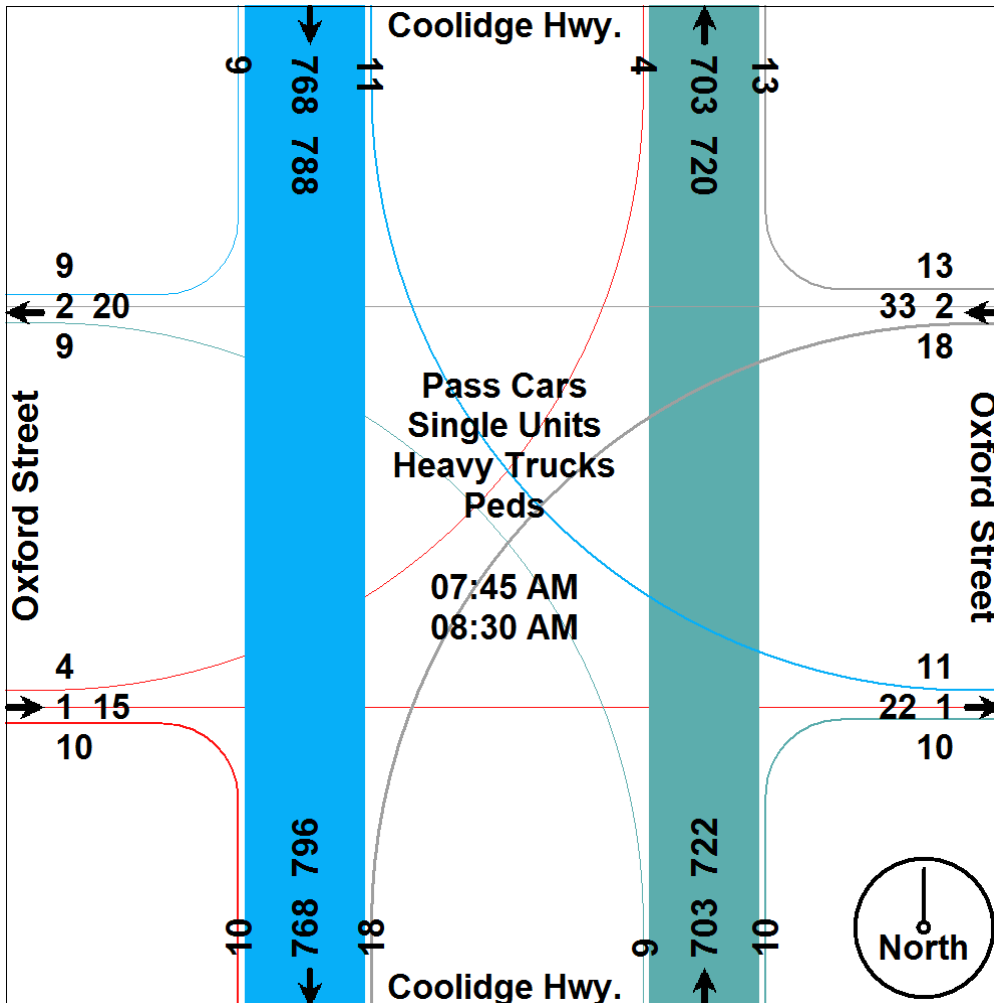
Giffels Webster



Project: Berkley Traffic Impact Study
Type: 4 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. PM Deg's 80's
Count By: Miovision Video VCU 4G2

File Name : TMC_1 Coolidge & Oxford_7-18-17
Site Code : TMC_1
Start Date : 7/18/2017
Page No : 3

Start Time	Coolidge Hwy. Southbound				Oxford Street Westbound				Coolidge Hwy. Northbound				Oxford Street Eastbound				Int. Total
	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 12:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	3	217	2	222	2	0	4	6	2	156	2	160	3	0	4	7	395
08:00 AM	3	189	1	193	4	0	3	7	3	172	1	176	3	0	0	3	379
08:15 AM	3	181	2	186	3	1	7	11	3	186	4	193	2	0	0	2	392
08:30 AM	0	181	6	187	4	1	4	9	2	189	2	193	2	1	0	3	392
Total Volume	9	768	11	788	13	2	18	33	10	703	9	722	10	1	4	15	1558
% App. Total	1.1	97.5	1.4		39.4	6.1	54.5		1.4	97.4	1.2		66.7	6.7	26.7		
PHF	.750	.885	.458	.887	.813	.500	.643	.750	.833	.930	.563	.935	.833	.250	.250	.536	.986
Pass Cars	9	754	11	774	11	2	16	29	7	688	9	704	10	1	4	15	1522
% Pass Cars	100	98.2	100	98.2	84.6	100	88.9	87.9	70.0	97.9	100	97.5	100	100	100	100	97.7
Single Units	0	12	0	12	2	0	1	3	3	12	0	15	0	0	0	0	30
% Single Units	0	1.6	0	1.5	15.4	0	5.6	9.1	30.0	1.7	0	2.1	0	0	0	0	1.9
Heavy Trucks	0	2	0	2	0	0	1	1	0	3	0	3	0	0	0	0	6
% Heavy Trucks	0	0.3	0	0.3	0	0	5.6	3.0	0	0.4	0	0.4	0	0	0	0	0.4
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Traffic Data Collection, LLC

tdccounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

Giffels Webster



Project: Berkley Traffic Impact Study
Type: 4 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. PM Deg's 80's
Count By: Miovision Video VCU 4G2

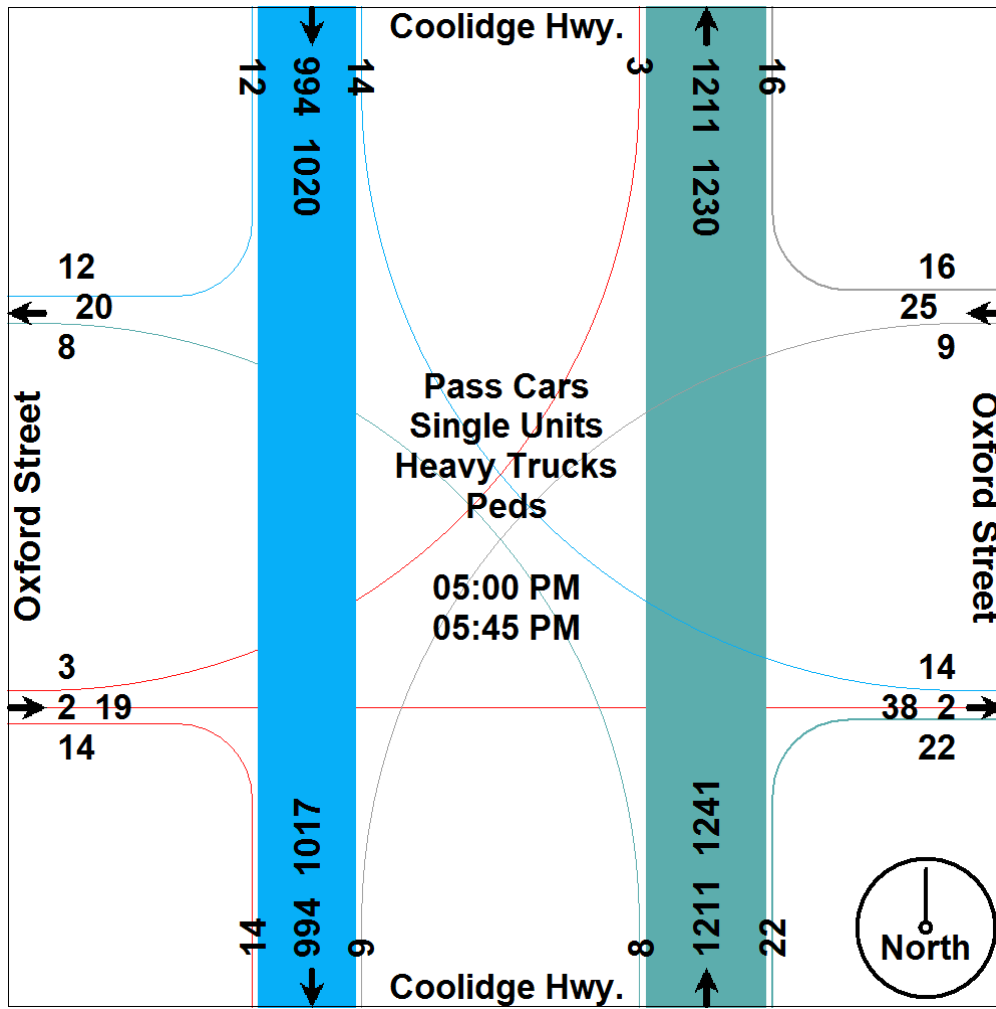
File Name : TMC_1 Coolidge & Oxford_7-18-17
Site Code : TMC_1
Start Date : 7/18/2017
Page No : 4

Start Time	Coolidge Hwy. Southbound				Oxford Street Westbound				Coolidge Hwy. Northbound				Oxford Street Eastbound				Int. Total
	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	

Peak Hour Analysis From 12:45 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 05:00 PM

05:00 PM	4	264	4	272	4	0	3	7	4	294	3	301	6	0	1	7	587
05:15 PM	3	231	4	238	4	0	2	6	4	314	2	320	0	2	0	2	566
05:30 PM	3	245	3	251	3	0	2	5	11	311	2	324	3	0	1	4	584
05:45 PM	2	254	3	259	5	0	2	7	3	292	1	296	5	0	1	6	568
Total Volume	12	994	14	1020	16	0	9	25	22	1211	8	1241	14	2	3	19	2305
% App. Total	1.2	97.5	1.4		64	0	36		1.8	97.6	0.6		73.7	10.5	15.8		
PHF	.750	.941	.875	.938	.800	.000	.750	.893	.500	.964	.667	.958	.583	.250	.750	.679	.982
Pass Cars	12	987	14	1013	16	0	8	24	21	1202	8	1231	14	2	3	19	2287
% Pass Cars	100	99.3	100	99.3	100	0	88.9	96.0	95.5	99.3	100	99.2	100	100	100	100	99.2
Single Units	0	7	0	7	0	0	1	1	1	9	0	10	0	0	0	0	18
% Single Units	0	0.7	0	0.7	0	0	11.1	4.0	4.5	0.7	0	0.8	0	0	0	0	0.8
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Traffic Data Collection, LLC

tdccounts.com

Phone: (586) 786-5407

Traffic Study Pefomed For:

Giffels Webster



Project: Berkley Traffic Impact Study
Type: 4 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. PM Deg's 80's
Count By: Miovision Video VCU 4G2

File Name : TMC_1 Coolidge & Oxford_7-18-17
Site Code : TMC_1
Start Date : 7/18/2017
Page No : 5

Aerial Photo



Traffic Data Collection, LLC

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Phone: (586) 786-5407

Traffic Study Performed For:

Giffels Webster



Project: Berkley Traffic Impact Study
Type: 4 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. PM Deg's 80's
Count By: Miovision Video VCU 5DV

File Name : TMC_2 Coolidge & Harvard_7-18-17
Site Code : TMC_2
Start Date : 7/18/2017
Page No : 1

Groups Printed- Pass Cars - Single Units - Heavy Trucks - Peds

Start Time	Coolidge Hwy. Southbound					Harvard Street Westbound					Coolidge Hwy. Northbound					Harvard Street Eastbound					Int. Total
	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	
07:00 AM	1	108	0	0	109	4	1	7	0	12	5	113	1	0	119	0	0	3	0	3	243
07:15 AM	0	123	0	2	125	2	1	5	0	8	2	110	0	0	112	2	0	1	0	3	248
07:30 AM	5	163	0	0	168	2	0	4	1	7	2	163	2	0	167	1	2	1	0	4	346
07:45 AM	3	202	4	0	209	3	0	6	0	9	1	157	4	0	162	2	0	1	0	3	383
Total	9	596	4	2	611	11	2	22	1	36	10	543	7	0	560	5	2	6	0	13	1220
08:00 AM	2	186	1	0	189	3	0	11	0	14	1	166	1	0	168	1	1	8	1	11	382
08:15 AM	1	192	2	0	195	6	1	3	0	10	5	184	0	0	189	0	0	0	0	0	394
08:30 AM	3	182	2	0	187	3	3	5	2	13	1	185	0	0	186	1	0	1	1	3	389
08:45 AM	4	168	0	0	172	3	1	6	1	11	2	177	0	0	179	1	0	2	0	3	365
Total	10	728	5	0	743	15	5	25	3	48	9	712	1	0	722	3	1	11	2	17	1530
**** BREAK ****																					
04:00 PM	3	212	3	0	218	0	2	2	1	5	2	213	3	0	218	3	4	3	1	11	452
04:15 PM	2	229	2	0	233	6	2	6	2	16	3	227	1	1	232	0	2	2	0	4	485
04:30 PM	2	213	4	2	221	6	0	3	0	9	5	255	3	0	263	3	1	8	3	15	508
04:45 PM	3	239	1	0	243	2	1	8	2	13	3	264	1	0	268	2	1	1	5	9	533
Total	10	893	10	2	915	14	5	19	5	43	13	959	8	1	981	8	8	14	9	39	1978
05:00 PM	2	268	8	3	281	10	2	9	0	21	5	287	4	1	297	4	4	12	0	20	619
05:15 PM	1	212	2	0	215	5	2	5	3	15	1	305	1	0	307	1	4	9	1	15	552
05:30 PM	2	241	1	0	244	7	3	2	0	12	6	307	1	0	314	3	0	9	0	12	582
05:45 PM	5	244	7	0	256	5	3	4	1	13	4	287	1	1	293	4	3	9	1	17	579
Total	10	965	18	3	996	27	10	20	4	61	16	1186	7	2	1211	12	11	39	2	64	2332
Grand Total	39	3182	37	7	3265	67	22	86	13	188	48	3400	23	3	3474	28	22	70	13	133	7060
Aprch %	1.2	97.5	1.1	0.2		35.6	11.7	45.7	6.9		1.4	97.9	0.7	0.1		21.1	16.5	52.6	9.8		
Total %	0.6	45.1	0.5	0.1	46.2	0.9	0.3	1.2	0.2	2.7	0.7	48.2	0.3	0	49.2	0.4	0.3	1	0.2	1.9	
Pass Cars	39	3121	37	0	3197	67	22	86	0	175	46	3355	22	0	3423	28	22	69	0	119	6914
% Pass Cars	100	98.1	100	0	97.9	100	100	100	0	93.1	95.8	98.7	95.7	0	98.5	100	100	98.6	0	89.5	97.9
Single Units	0	54	0	0	54	0	0	0	0	0	2	40	1	0	43	0	0	1	0	1	98
% Single Units	0	1.7	0	0	1.7	0	0	0	0	0	4.2	1.2	4.3	0	1.2	0	0	1.4	0	0.8	1.4
Heavy Trucks	0	7	0	0	7	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	12
% Heavy Trucks	0	0.2	0	0	0.2	0	0	0	0	0	0	0.1	0	0	0.1	0	0	0	0	0	0.2
Peds	0	0	0	7	7	0	0	0	13	13	0	0	0	3	3	0	0	0	13	13	36
% Peds	0	0	0	100	0.2	0	0	0	100	6.9	0	0	0	100	0.1	0	0	0	100	9.8	0.5

Comments: 4 Hour video intersection turning movement traffic study conducted during typical weekday (Tuesday) from 7:00-9:00 AM morning & 4:00-6:00 PM afternoon peak hours, while school was not in session. Signalized intersection, ped. signals for all quadrants, no push buttons. VCU video camera was located within NW intersection quadrant.

Traffic Data Collection, LLC

tdccounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

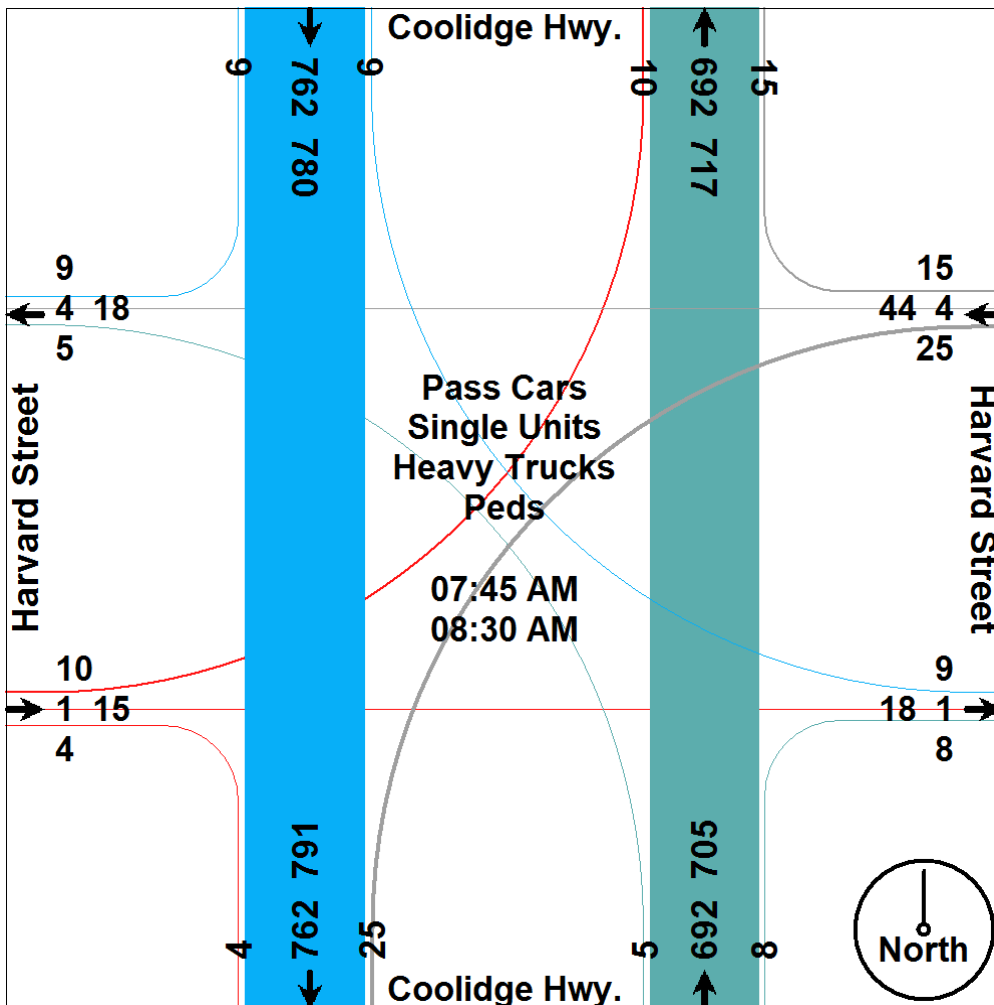
Giffels Webster



Project: Berkley Traffic Impact Study
Type: 4 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. PM Deg's 80's
Count By: Miovision Video VCU 5DV

File Name : TMC_2 Coolidge & Harvard_7-18-17
Site Code : TMC_2
Start Date : 7/18/2017
Page No : 3

Start Time	Coolidge Hwy. Southbound				Harvard Street Westbound				Coolidge Hwy. Northbound				Harvard Street Eastbound				Int. Total
	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 12:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	3	202	4	209	3	0	6	9	1	157	4	162	2	0	1	3	383
08:00 AM	2	186	1	189	3	0	11	14	1	166	1	168	1	1	8	10	381
08:15 AM	1	192	2	195	6	1	3	10	5	184	0	189	0	0	0	0	394
08:30 AM	3	182	2	187	3	3	5	11	1	185	0	186	1	0	1	2	386
Total Volume	9	762	9	780	15	4	25	44	8	692	5	705	4	1	10	15	1544
% App. Total	1.2	97.7	1.2		34.1	9.1	56.8		1.1	98.2	0.7		26.7	6.7	66.7		
PHF	.750	.943	.563	.933	.625	.333	.568	.786	.400	.935	.313	.933	.500	.250	.313	.375	.980
Pass Cars	9	747	9	765	15	4	25	44	8	676	4	688	4	1	10	15	1512
% Pass Cars	100	98.0	100	98.1	100	100	100	100	100	97.7	80.0	97.6	100	100	100	100	97.9
Single Units	0	11	0	11	0	0	0	0	0	13	1	14	0	0	0	0	25
% Single Units	0	1.4	0	1.4	0	0	0	0	0	1.9	20.0	2.0	0	0	0	0	1.6
Heavy Trucks	0	4	0	4	0	0	0	0	0	3	0	3	0	0	0	0	7
% Heavy Trucks	0	0.5	0	0.5	0	0	0	0	0	0.4	0	0.4	0	0	0	0	0.5
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Traffic Data Collection, LLC

tdccounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

Giffels Webster



Project: Berkley Traffic Impact Study
Type: 4 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. PM Deg's 80's
Count By: Miovision Video VCU 5DV

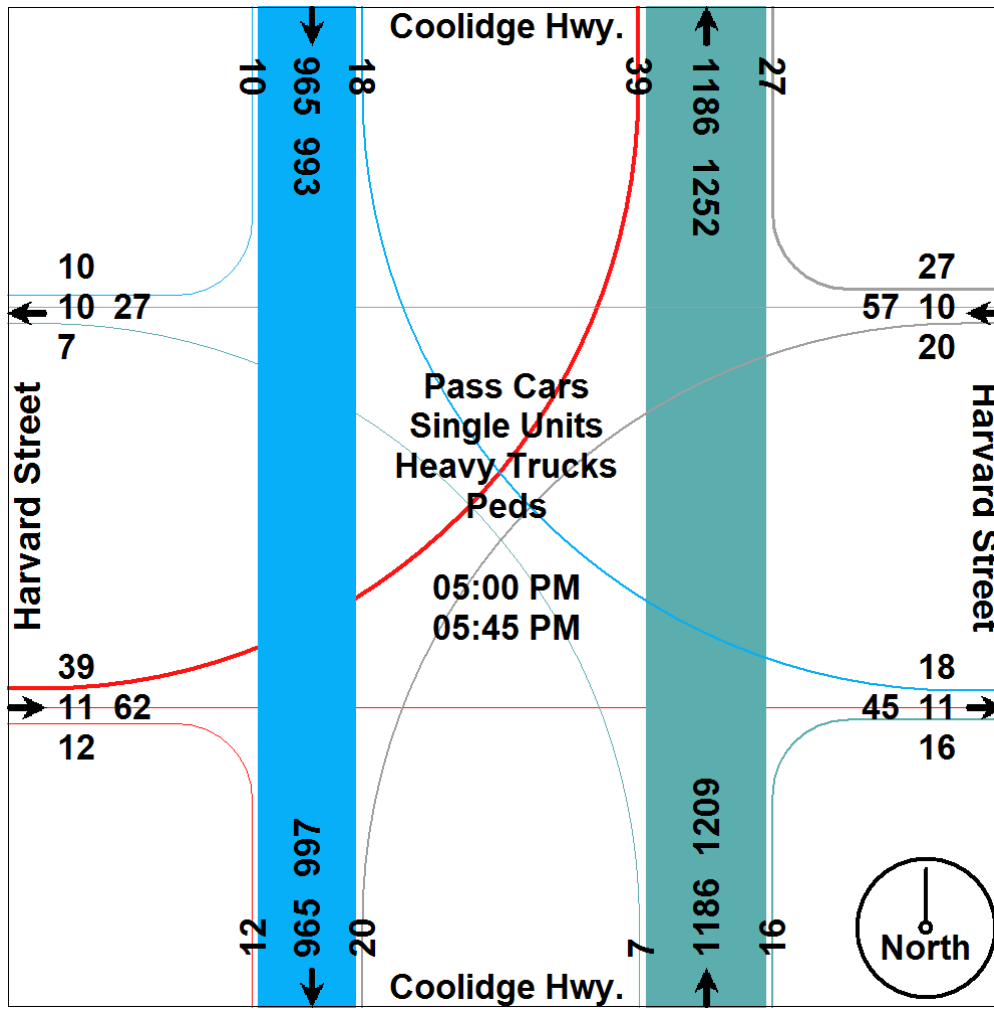
File Name : TMC_2 Coolidge & Harvard_7-18-17
Site Code : TMC_2
Start Date : 7/18/2017
Page No : 4

Start Time	Coolidge Hwy. Southbound				Harvard Street Westbound				Coolidge Hwy. Northbound				Harvard Street Eastbound				Int. Total
	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	

Peak Hour Analysis From 12:45 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 05:00 PM

05:00 PM	2	268	8	278	10	2	9	21	5	287	4	296	4	4	12	20	615
05:15 PM	1	212	2	215	5	2	5	12	1	305	1	307	1	4	9	14	548
05:30 PM	2	241	1	244	7	3	2	12	6	307	1	314	3	0	9	12	582
05:45 PM	5	244	7	256	5	3	4	12	4	287	1	292	4	3	9	16	576
Total Volume	10	965	18	993	27	10	20	57	16	1186	7	1209	12	11	39	62	2321
% App. Total	1	97.2	1.8		47.4	17.5	35.1		1.3	98.1	0.6		19.4	17.7	62.9		
PHF	.500	.900	.563	.893	.675	.833	.556	.679	.667	.966	.438	.963	.750	.688	.813	.775	.943
Pass Cars	10	958	18	986	27	10	20	57	16	1175	7	1198	12	11	38	61	2302
% Pass Cars	100	99.3	100	99.3	100	100	100	100	100	99.1	100	99.1	100	100	97.4	98.4	99.2
Single Units	0	7	0	7	0	0	0	0	0	11	0	11	0	0	1	1	19
% Single Units	0	0.7	0	0.7	0	0	0	0	0	0.9	0	0.9	0	0	2.6	1.6	0.8
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Traffic Data Collection, LLC

tdccounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

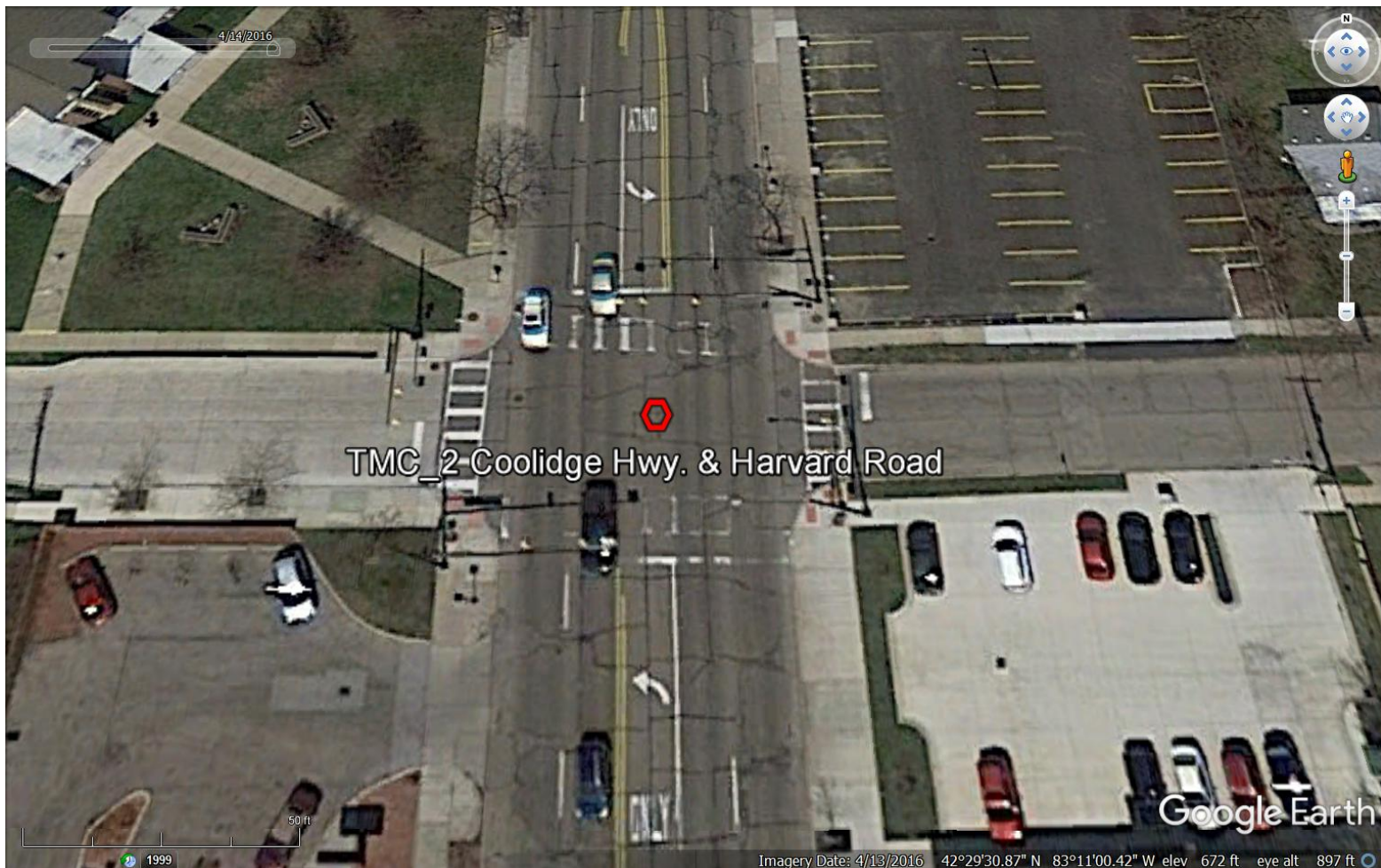
Giffels Webster



Project: Berkley Traffic Impact Study
Type: 4 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. PM Deg's 80's
Count By: Miovision Video VCU 5DV

File Name : TMC_2 Coolidge & Harvard_7-18-17
Site Code : TMC_2
Start Date : 7/18/2017
Page No : 5

Aerial Photo



Traffic Data Collection (TDC)

Project: Berkley Traffic Impact Study
 Count Type: 48 Hr. ATR Volume Count
 Weather: Pt. Sunny, 80's Degs.
 Count By: M.Match Pav't : Concrete 2 Lanes

tdccounts.com

Phone (586) 786-5407

Traffic Study Performed For:

Giffels & Webster



ATR_1 Kipling S_ Oxford
 Kipling Ave.
 (250' South of Oxford Road0
 Station ID: 2-Way Volume Count
 Site Code: ATR 1
 Date Start: Tuesday, July 25, 2017

Start Time	Monday, July 24, 2017		Tuesday, July 25, 2017		Wednesday, July 26, 2017		Thursday, July 27, 2017		Friday, July 28, 2017		Weekday Average		Saturday, July 29, 2017		Sunday, July 30, 2017	
	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB
12:00 AM	*	*	*	*	0	6	2	4	*	*	1	5	*	*	*	*
01:00	*	*	*	*	2	3	2	0	*	*	2	2	*	*	*	*
02:00	*	*	*	*	2	1	0	0	*	*	1	0	*	*	*	*
03:00	*	*	*	*	1	0	0	3	*	*	0	2	*	*	*	*
04:00	*	*	*	*	2	1	2	1	*	*	2	1	*	*	*	*
05:00	*	*	*	*	2	2	2	1	*	*	2	2	*	*	*	*
06:00	*	*	*	*	10	6	12	5	*	*	11	6	*	*	*	*
07:00	*	*	*	*	22	17	18	22	*	*	20	20	*	*	*	*
08:00	*	*	*	*	21	23	21	15	*	*	21	19	*	*	*	*
09:00	*	*	*	*	23	23	11	36	*	*	17	30	*	*	*	*
10:00	*	*	*	*	23	16	16	17	*	*	20	16	*	*	*	*
11:00	*	*	27	23	16	24	*	*	*	*	22	24	*	*	*	*
12:00 PM	*	*	15	55	20	27	*	*	*	*	18	41	*	*	*	*
01:00	*	*	19	28	24	28	*	*	*	*	22	28	*	*	*	*
02:00	*	*	10	24	20	31	*	*	*	*	15	28	*	*	*	*
03:00	*	*	23	36	21	31	*	*	*	*	22	34	*	*	*	*
04:00	*	*	27	45	13	38	*	*	*	*	20	42	*	*	*	*
05:00	*	*	32	53	41	47	*	*	*	*	36	50	*	*	*	*
06:00	*	*	31	26	25	44	*	*	*	*	28	35	*	*	*	*
07:00	*	*	17	22	12	31	*	*	*	*	14	26	*	*	*	*
08:00	*	*	11	25	22	19	*	*	*	*	16	22	*	*	*	*
09:00	*	*	16	12	13	9	*	*	*	*	14	10	*	*	*	*
10:00	*	*	8	3	11	10	*	*	*	*	10	6	*	*	*	*
11:00	*	*	2	2	6	5	*	*	*	*	4	4	*	*	*	*
Total Day	0	0	238	354	352	442	86	104	0	0	338	453	0	0	0	0
AM Peak	-	-	11:00	11:00	09:00	11:00	08:00	09:00	-	-	11:00	09:00	-	-	-	-
Vol.	-	-	27	23	23	24	21	36	-	-	22	30	-	-	-	-
PM Peak	-	-	17:00	12:00	17:00	17:00	-	-	-	-	17:00	17:00	-	-	-	-
Vol.	-	-	32	55	41	47	-	-	-	-	36	50	-	-	-	-

Comb. Total	0	592	794	190	0	791	0	0
ADT	ADT 787	AADT 787						

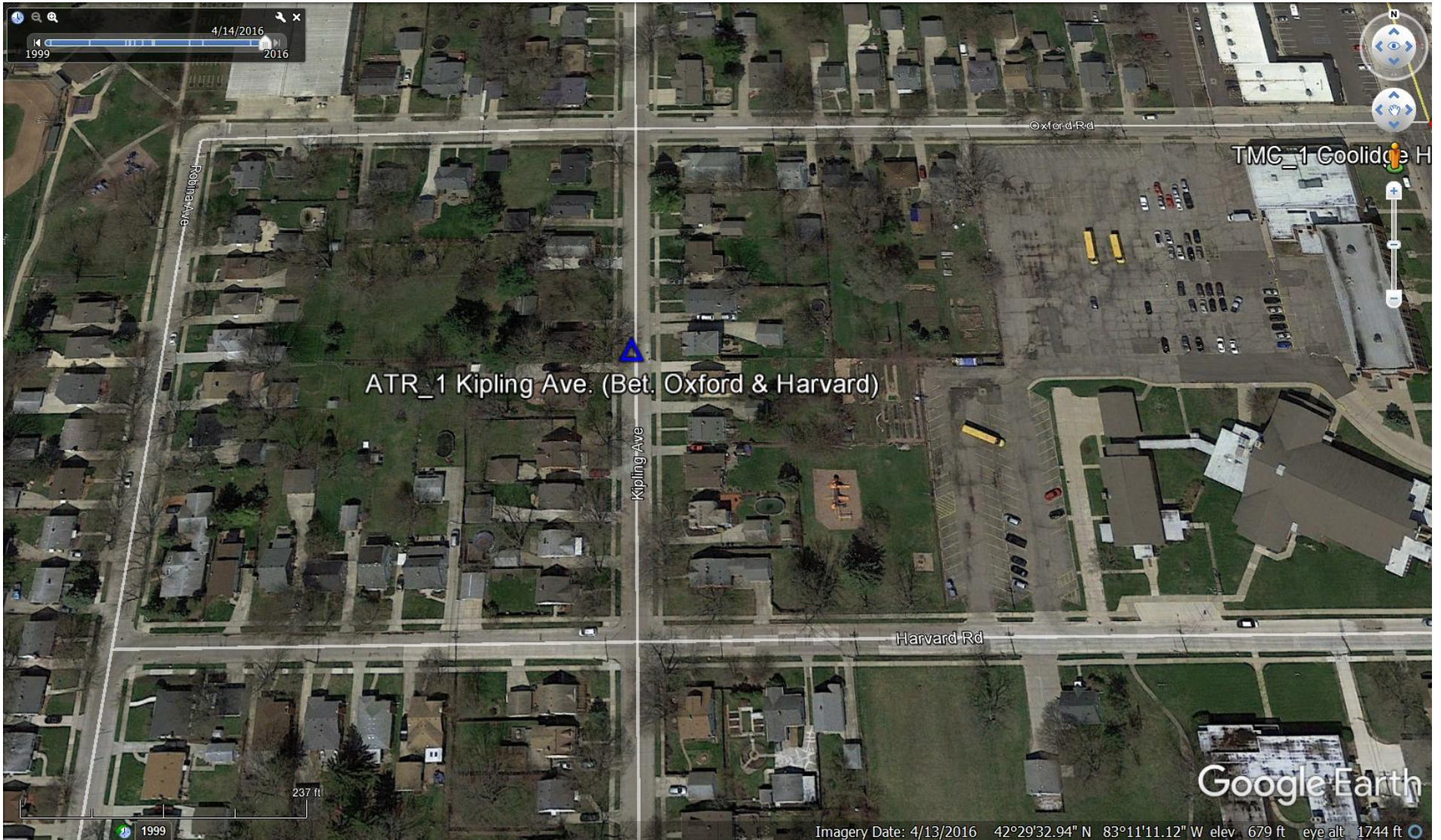


Project: Berkley Traffic Impact Study
Count Type: 48 Hr. ATR Volume Count
Weather: Pt. Sunny, 80's Degs.
Count By: M.Match Pav't : Concrete 2 Lanes

Traffic Data Collection (TDC)

tdccounts.com
Phone (586) 786-5407
Traffic Study Performed For:
Giffels & Webster

ATR_1 Kipling S_Oxford
Kipling Ave.
(250' South of Oxford Road0
Station ID: 2-Way Volume Count
Site Code: ATR 1
Date Start: Tuesday, July 25, 2017



Traffic Data Collection (TDC)

Project: Berkley Traffic Impact Study
 Count Type: 48 Hr. ATR Volume Count
 Weather: Pt. Sunny, 80's Degs.
 Count By: M.Match Pav't : Concrete 2 Lanes

tdccounts.com
 Phone (586) 786-5407
 Traffic Study Performed For:
Giffels & Webster



ATR_1 Kipling S_Oxford
 Kipling Ave.
 (250' South of Oxford Road0
 Station ID: 2-Way Volume Count
 Site Code: ATR 1
 Date Start: Tuesday, July 25, 2017

Start Time	Tuesday, J Tue		SB		NB		Combined		Wedne Wed	SB		NB		Combined	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
12:00	*	6	*	8	*	14		0	7	2	4	2	11		
12:15	*	6	*	10	*	16		0	5	2	10	2	15		
12:30	*	3	*	19	*	22		0	7	1	9	1	16		
12:45	*	0	*	18	*	18		0	1	1	4	1	5		
01:00	*	3	*	7	*	10		0	6	2	9	2	15		
01:15	*	6	*	5	*	11		0	6	0	6	0	12		
01:30	*	7	*	12	*	19		1	7	1	7	2	14		
01:45	*	3	*	4	*	7		1	5	0	6	1	11		
02:00	*	2	*	7	*	9		1	4	0	6	1	10		
02:15	*	3	*	4	*	7		0	5	1	6	1	11		
02:30	*	3	*	9	*	12		0	6	0	13	0	19		
02:45	*	2	*	4	*	6		1	5	0	6	1	11		
03:00	*	5	*	7	*	12		0	6	0	7	0	13		
03:15	*	2	*	9	*	11		0	4	0	9	0	13		
03:30	*	6	*	8	*	14		0	3	0	8	0	11		
03:45	*	10	*	12	*	22		1	8	0	7	1	15		
04:00	*	12	*	12	*	24		1	3	0	7	1	10		
04:15	*	3	*	10	*	13		0	3	0	10	0	13		
04:30	*	5	*	7	*	12		1	5	1	8	2	13		
04:45	*	7	*	16	*	23		0	2	0	13	0	15		
05:00	*	5	*	14	*	19		0	6	0	11	0	17		
05:15	*	6	*	13	*	19		0	19	0	13	0	32		
05:30	*	11	*	10	*	21		0	8	0	14	0	22		
05:45	*	10	*	16	*	26		2	8	2	9	4	17		
06:00	*	10	*	6	*	16		0	9	0	16	0	25		
06:15	*	12	*	9	*	21		2	4	1	10	3	14		
06:30	*	3	*	6	*	9		2	6	2	7	4	13		
06:45	*	6	*	5	*	11		6	6	3	11	9	17		
07:00	*	6	*	6	*	12		4	5	2	13	6	18		
07:15	*	5	*	7	*	12		4	3	6	7	10	10		
07:30	*	4	*	4	*	8		7	3	2	7	9	10		
07:45	*	2	*	5	*	7		7	1	7	4	14	5		
08:00	*	3	*	3	*	6		8	5	6	4	14	9		
08:15	*	3	*	7	*	10		5	4	3	5	8	9		
08:30	*	4	*	9	*	13		5	8	5	5	10	13		
08:45	*	1	*	6	*	7		3	5	9	5	12	10		
09:00	*	2	*	4	*	6		10	3	8	0	18	3		
09:15	*	6	*	2	*	8		7	5	4	3	11	8		
09:30	*	3	*	0	*	3		4	2	7	5	11	7		
09:45	*	5	*	6	*	11		2	3	4	1	6	4		
10:00	*	2	*	1	*	3		5	4	6	1	11	5		
10:15	*	0	*	1	*	1		3	4	2	3	5	7		
10:30	*	2	*	1	*	3		3	3	2	2	5	5		
10:45	*	4	*	0	*	4		12	0	6	4	18	4		
11:00	13	1	2	1	15	2		2	1	6	0	8	1		
11:15	5	0	5	0	10	0		5	3	7	2	12	5		
11:30	5	0	5	0	10	0		3	1	3	1	6	2		
11:45	4	1	11	1	15	2		6	1	8	2	14	3		
Total	27	211	23	331	50	542		124	228	122	320	246	548		
Day Total	238		354		592			352		442		794			
% Total	4.6%	35.6%	3.9%	55.9%			15.6%	28.7%	15.4%	40.3%					
Peak	-	11:00	05:30	11:00	12:00	11:00	05:00	-	07:30	05:15	08:45	05:15	08:45	05:15	
Vol.	-	27	43	23	55	50	85	-	27	44	28	52	52	96	
P.H.F.		0.519	0.896	0.523	0.724	0.833	0.817		0.844	0.579	0.778	0.813	0.722	0.750	

TRAFFIC IMPACT STUDY FOR "THE BERKLEY"
AM Turning-Movement Count at Kipling and Oxford
 Wednesday, 7-26-17

Cumulative Turning-Movement Count

15 Minutes Ending (Enter Data)	EB Oxford			WB Oxford			NB Kipling			SB Kipling			Total
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
7:15	1	0	0	1	0	3	0	2	0	3	3	0	13
7:30	1	1	0	2	0	3	0	6	0	3	6	0	22
7:45	2	3	0	3	1	3	0	9	0	4	11	0	36
8:00	4	3	1	3	2	9	0	15	1	4	17	1	60
8:15	7	3	1	3	2	11	1	19	1	4	24	3	79
8:30	10	4	1	3	2	11	1	21	2	4	28	3	90
8:45	12	5	1	3	3	12	1	24	2	6	33	3	105
9:00	15	5	1	4	4	13	1	33	3	6	36	5	126

Turning-Movement Count by 15-Minute Interval

15 Minutes Ending	EB Oxford			WB Oxford			NB Kipling			SB Kipling			Total
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
7:15	1	0	0	1	0	3	0	2	0	3	3	0	13
7:30	0	1	0	1	0	0	0	4	0	0	3	0	9
7:45	1	2	0	1	1	0	0	3	0	1	5	0	14
8:00	2	0	1	0	1	6	0	6	1	0	6	1	24
8:15	3	0	0	0	0	2	1	4	0	0	7	2	19
8:30	3	1	0	0	0	0	0	2	1	0	4	0	11
8:45	2	1	0	0	1	1	0	3	0	2	5	0	15
9:00	3	0	0	1	1	1	0	9	1	0	3	2	21
TOTAL	15	5	1	4	4	13	1	33	3	6	36	5	126

Hourly Total

Hour Beginning	EB Oxford			WB Oxford			NB Kipling			SB Kipling			Total
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
7:00	4	3	1	3	2	9	0	15	1	4	17	1	60
7:15	6	3	1	2	2	8	1	17	1	1	21	3	66
7:30	9	3	1	1	2	8	1	15	2	1	22	3	68
7:45	10	2	1	0	2	9	1	15	2	2	22	3	69
8:00	11	2	0	1	2	4	1	18	2	2	19	4	66

AM Peak Hour

Hour Beginning	EB Oxford			WB Oxford			NB Kipling			SB Kipling			Total
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
7:45	10	2	1	0	2	9	1	15	2	2	22	3	69
PHF (Peak-Hour Factor)	0.83	0.50	0.25	#DIV/0!	0.50	0.38	0.25	0.63	0.50	0.25	0.79	0.38	0.72
	0.81			0.39			0.64			0.75			

TRAFFIC IMPACT STUDY FOR "THE BERKLEY"
PM Turning-Movement Count at Kipling and Oxford
 Wednesday, 7-26-17

Cumulative Turning-Movement Count

15 Minutes Ending (Enter Data)	EB Oxford			WB Oxford			NB Kipling			SB Kipling			Total
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
4:15	3	1	0	1	3	1	2	5	0	0	2	1	19
4:30	8	1	0	1	7	1	2	14	0	1	8	2	45
4:45	9	5	0	1	7	3	2	23	0	1	12	4	67
5:00	11	7	1	1	7	4	3	36	0	2	14	4	90
5:15	14	8	2	1	9	7	3	44	1	2	19	5	115
5:30	17	13	2	2	11	8	3	57	1	2	39	8	163
5:45	18	15	2	2	15	9	3	72	4	2	47	8	197
6:00	22	17	3	3	19	12	4	79	4	2	53	10	228

Turning-Movement Count by 15-Minute Interval

15 Minutes Ending	EB Oxford			WB Oxford			NB Kipling			SB Kipling			Total
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
4:15	3	1	0	1	3	1	2	5	0	0	2	1	19
4:30	5	0	0	0	4	0	0	9	0	1	6	1	26
4:45	1	4	0	0	0	2	0	9	0	0	4	2	22
5:00	2	2	1	0	0	1	1	13	0	1	2	0	23
5:15	3	1	1	0	2	3	0	8	1	0	5	1	25
5:30	3	5	0	1	2	1	0	13	0	0	20	3	48
5:45	1	2	0	0	4	1	0	15	3	0	8	0	34
6:00	4	2	1	1	4	3	1	7	0	0	6	2	31
TOTAL	22	17	3	3	19	12	4	79	4	2	53	10	228

Hourly Total

Hour Beginning	EB Oxford			WB Oxford			NB Kipling			SB Kipling			Total
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
4:00	11	7	1	1	7	4	3	36	0	2	14	4	90
4:15	11	7	2	0	6	6	1	39	1	2	17	4	96
4:30	9	12	2	1	4	7	1	43	1	1	31	6	118
4:45	9	10	2	1	8	6	1	49	4	1	35	4	130
5:00	11	10	2	2	12	8	1	43	4	0	39	6	138

PM Peak Hour

Hour Beginning	EB Oxford			WB Oxford			NB Kipling			SB Kipling			Total
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
5:00	11	10	2	2	12	8	1	43	4	0	39	6	138
PHF (Peak-Hour Factor)	0.69	0.50	0.50	0.50	0.75	0.67	0.25	0.72	0.33	#DIV/0!	0.49	0.50	0.72
	0.72			0.69			0.67			0.49			

TRAFFIC IMPACT STUDY FOR "THE BERKLEY"

AM Turning-Movement Count at Kipling and Harvard

Wednesday, 7-26-17

Cumulative Turning-Movement Count

15 Minutes Ending (Enter Data)	EB Harvard			WB Harvard			NB Kipling			SB Kipling			Total
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
7:15	0	2	0	0	0	0	0	2	0	0	4	0	8
7:30	0	3	0	0	1	0	0	5	2	1	7	0	19
7:45	0	7	0	1	3	0	0	6	3	2	11	0	33
8:00	1	10	0	2	3	0	0	12	4	5	14	0	51
8:15	4	13	0	4	5	1	0	17	6	7	20	0	77
8:30	4	16	0	4	6	1	0	19	9	8	23	1	91
8:45	4	18	0	5	10	1	0	20	10	8	30	1	107
9:00	5	23	0	5	12	3	0	26	13	10	32	1	130

Turning-Movement Count by 15-Minute Interval

15 Minutes Ending	EB Harvard			WB Harvard			NB Kipling			SB Kipling			Total
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
7:15	0	2	0	0	0	0	0	2	0	0	4	0	8
7:30	0	1	0	0	1	0	0	3	2	1	3	0	11
7:45	0	4	0	1	2	0	0	1	1	1	4	0	14
8:00	1	3	0	1	0	0	0	6	1	3	3	0	18
8:15	3	3	0	2	2	1	0	5	2	2	6	0	26
8:30	0	3	0	0	1	0	0	2	3	1	3	1	14
8:45	0	2	0	1	4	0	0	1	1	0	7	0	16
9:00	1	5	0	0	2	2	0	6	3	2	2	0	23
TOTAL	5	23	0	5	12	3	0	26	13	10	32	1	130

Hourly Total

¹ Peak hour on Coolidge at Harvard

Hour Beginning	EB Harvard			WB Harvard			NB Kipling			SB Kipling			Total
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
7:00	1	10	0	2	3	0	0	12	4	5	14	0	51
7:15	4	11	0	4	5	1	0	15	6	7	16	0	69
7:30	4	13	0	4	5	1	0	14	7	7	16	1	72
7:45 ¹	4	11	0	4	7	1	0	14	7	6	19	1	74
8:00	4	13	0	3	9	3	0	14	9	5	18	1	79

AM Peak Hour

Hour Beginning	EB Harvard			WB Harvard			NB Kipling			SB Kipling			Total
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
8:00	4	13	0	3	9	3	0	14	9	5	18	1	79
PHF (Peak-Hour Factor)	0.33	0.65	#DIV/0!	0.38	0.56	0.38	#DIV/0!	0.58	0.75	0.63	0.64	0.25	0.76
	0.71			0.75			0.64			0.75			

TRAFFIC IMPACT STUDY FOR "THE BERKLEY"
PM Turning-Movement Count at Kipling and Harvard
 Wednesday, 7-26-17

Cumulative Turning-Movement Count

15 Minutes Ending (Enter Data)	EB Harvard			WB Harvard			NB Kipling			SB Kipling			Total
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
4:15	0	4	0	1	4	1	0	6	4	0	3	0	23
4:30	1	8	0	1	6	3	0	13	6	1	5	0	44
4:45	2	8	0	1	9	4	0	18	9	2	6	2	61
5:00	2	12	0	1	12	4	0	30	10	2	8	2	83
5:15	3	17	0	5	18	5	0	40	14	4	12	2	120
5:30	3	24	0	5	22	7	0	49	15	6	27	4	162
5:45	3	27	0	7	23	8	2	64	18	7	32	5	196
6:00	3	33	0	8	29	8	2	72	23	9	35	7	229

Turning-Movement Count by 15-Minute Interval

15 Minutes Ending	EB Harvard			WB Harvard			NB Kipling			SB Kipling			Total
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
4:15	0	4	0	1	4	1	0	6	4	0	3	0	23
4:30	1	4	0	0	2	2	0	7	2	1	2	0	21
4:45	1	0	0	0	3	1	0	5	3	1	1	2	17
5:00	0	4	0	0	3	0	0	12	1	0	2	0	22
5:15	1	5	0	4	6	1	0	10	4	2	4	0	37
5:30	0	7	0	0	4	2	0	9	1	2	15	2	42
5:45	0	3	0	2	1	1	2	15	3	1	5	1	34
6:00	0	6	0	1	6	0	0	8	5	2	3	2	33
TOTAL	3	33	0	8	29	8	2	72	23	9	35	7	229

Hourly Total

Hour Beginning	EB Harvard			WB Harvard			NB Kipling			SB Kipling			Total
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
4:00	2	12	0	1	12	4	0	30	10	2	8	2	83
4:15	3	13	0	4	14	4	0	34	10	4	9	2	97
4:30	2	16	0	4	16	4	0	36	9	5	22	4	118
4:45	1	19	0	6	14	4	2	46	9	5	26	3	135
5:00	1	21	0	7	17	4	2	42	13	7	27	5	146

PM Peak Hour

Hour Beginning	EB Harvard			WB Harvard			NB Kipling			SB Kipling			Total
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
5:00	1	21	0	7	17	4	2	42	13	7	27	5	146
PHF (Peak-Hour Factor)	0.25	0.75	#DIV/0!	0.44	0.71	0.50	0.25	0.70	0.65	0.88	0.45	0.63	0.87
	0.79			0.64			0.71			0.51			

Table C-2. SEMCOG Seasonal Adjustment Factors

YEAR	ID	MONTH	SUNFAC	MONFAC	TUEFAC	WEDFAC	THURFAC	FRIFAC	SATFAC
2016	1	Jan	1.662	1.179	1.159	1.100	1.068	1.110	1.268
2016	2	Feb	1.442	1.083	1.091	1.130	1.120	0.976	1.185
2016	3	Mar	1.345	1.025	1.014	1.000	1.014	0.932	1.165
2016	4	Apr	1.367	0.966	0.958	0.940	0.936	0.879	1.132
2016	5	May	1.258	1.019	0.945	0.932	0.895	0.856	1.100
2016	6	Jun	1.219	0.928	0.906	0.897	0.878	0.841	1.061
2016	7	Jul	1.237	1.007	0.916	0.901	0.885	0.852	1.092
2016	8	Aug	1.170	0.913	0.910	0.889	0.866	0.831	1.069
2016	9	Sep	1.237	1.017	0.937	0.948	0.927	0.864	1.105
2016	10	Oct	1.263	0.976	0.946	0.933	0.920	0.851	1.086
2016	11	Nov	1.305	1.000	0.973	0.965	1.005	0.939	1.160
2016	12	Dec	1.690	1.193	1.061	1.012	1.017	0.981	1.301

Traffic Counts

The Regional Traffic Counts Database is SEMCOG's central repository for traffic counts in the Southeast Michigan region. Traffic counts in this database were collected and provided to SEMCOG by county road commissions, local communities in Southeast Michigan, the Michigan Department of Transportation, and by consultants specializing in traffic data collection. Each count was taken during a continuous 24-hour period. The initial search results show the most recent Average Annual Daily Traffic (AADT) for the given location for the stated year. AADT are traffic volumes that are adjusted by a month and day of week factor to account for seasonal variations in traffic. By clicking on a AADT hyperlink, you will leave SEMCOG's website and will be directed to a more detailed report containing the AADT, Raw Traffic Count, and other information.

Seasonal adjustment factors are used to calculate average annual daily traffic (AADT) from short duration vehicle counts. These seasonal factors were developed using the Permanent Traffic Recorders (PTR) located in Southeast Michigan. The factors were averaged from each of these locations, thus resulting in adjustment factors by year and month for each day of the week. These adjustment factors can be applied to the raw counts in Southeast Michigan. An estimated AADT is produced by multiplying the factors times the raw counts. Click [seasonal adjustment factors](#) to download the factors.

For more information on traffic counts contact [Chade Saghir](#). SEMCOG also has a [Traffic Volume map](#) in the [Map Gallery](#).

Table C-3. Residential Traffic by Hour of a Typical Weekday¹

Hour Starting	Heatherwood Condos (188 d.u.)			Weatherstone Condos (302 d.u.)			Combined Trips (490 d.u.)			% of Combined Trips		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
12 am	7	7	14	5	3	8	12	10	22	1%	1%	1%
1 am	3	2	5	4	2	6	7	4	11	1%	0%	0%
2 am	2	0	2	3	0	3	5	0	5	0%	0%	0%
3 am	1	1	2	0	0	0	1	1	2	0%	0%	0%
4 am	0	2	2	2	5	7	2	7	9	0%	0%	0%
5 am	4	5	9	4	15	19	8	20	28	1%	1%	1%
6 am	2	24	26	9	64	73	11	88	99	1%	6%	4%
7 am	4	75	79	16	103	119	20	178	198	2%	12%	7%
8 am	6	62	68	20	106	126	26	168	194	2%	12%	7%
9 am	6	24	30	32	67	99	38	91	129	3%	6%	5%
10 am	11	16	27	39	70	109	50	86	136	4%	6%	5%
11 am	14	26	40	40	67	107	54	93	147	4%	6%	5%
12 pm	28	25	53	42	53	95	70	78	148	5%	5%	5%
1 pm	20	21	41	42	47	89	62	68	130	5%	5%	5%
2 pm	16	17	33	32	43	75	48	60	108	4%	4%	4%
3 pm	22	18	40	80	48	128	102	66	168	8%	5%	6%
4 pm	37	19	56	69	39	108	106	58	164	8%	4%	6%
5 pm	48	20	68	105	60	165	153	80	233	12%	6%	8%
6 pm	58	34	92	91	48	139	149	82	231	11%	6%	8%
7 pm	44	26	70	66	54	120	110	80	190	8%	6%	7%
8 pm	46	15	61	59	43	102	105	58	163	8%	4%	6%
9 pm	22	12	34	63	22	85	85	34	119	6%	2%	4%
10 pm	26	7	33	35	28	63	61	35	96	5%	2%	3%
11 pm	15	2	17	18	5	23	33	7	40	3%	0%	1%
Total	442	460	902	876	992	1868	1318	1452	2770	100%	100%	100%

¹ Data collected by Traffic Data Collection, LLC for Birchler Arroyo Associates, Inc. in November 2003, at two condo developments on the south edge of the Ann Arbor urban area.

APPENDIX D:
BACKGROUND TRAFFIC

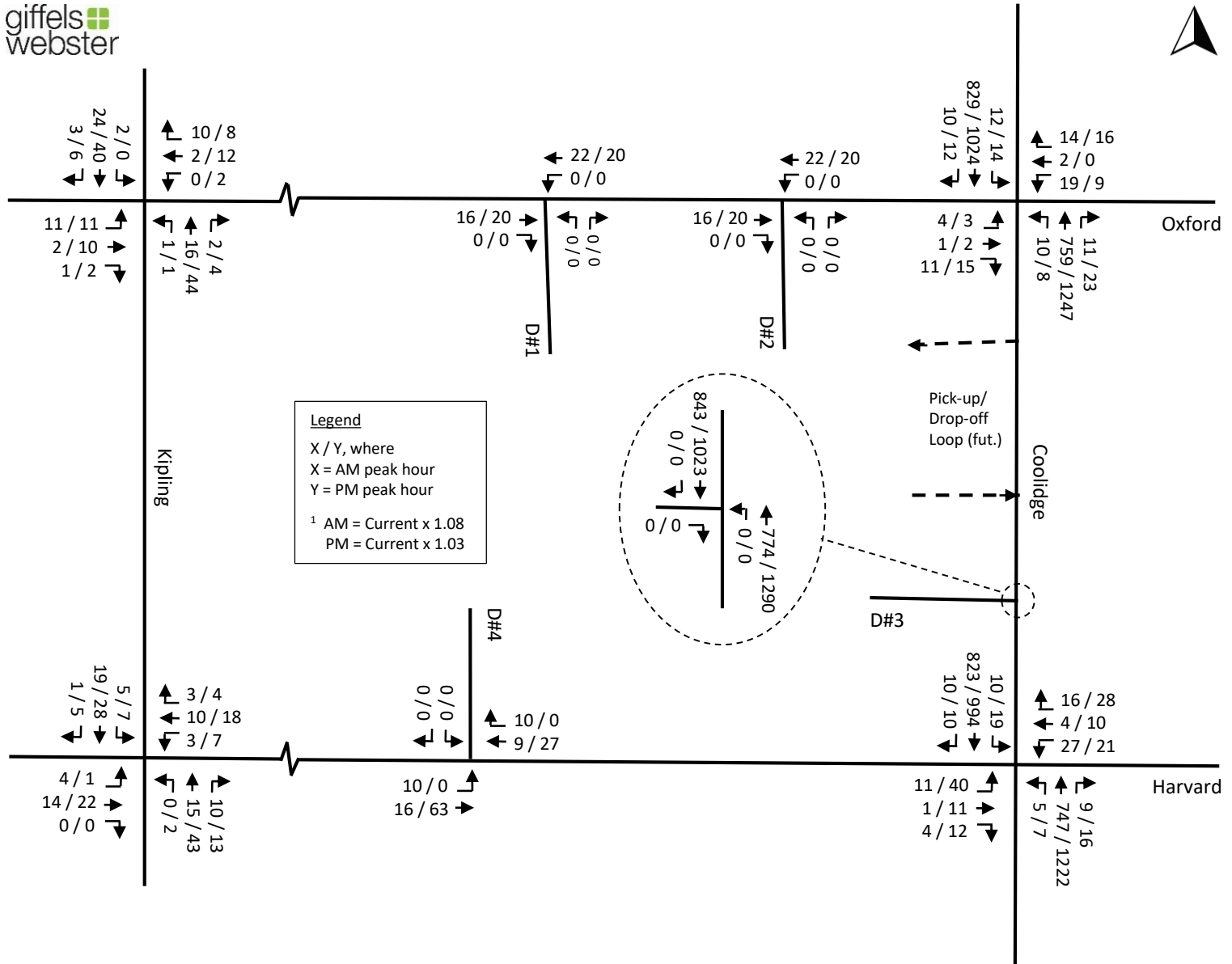


Figure D-1. Future Background Peak-Hour Volumes due to General Trends¹

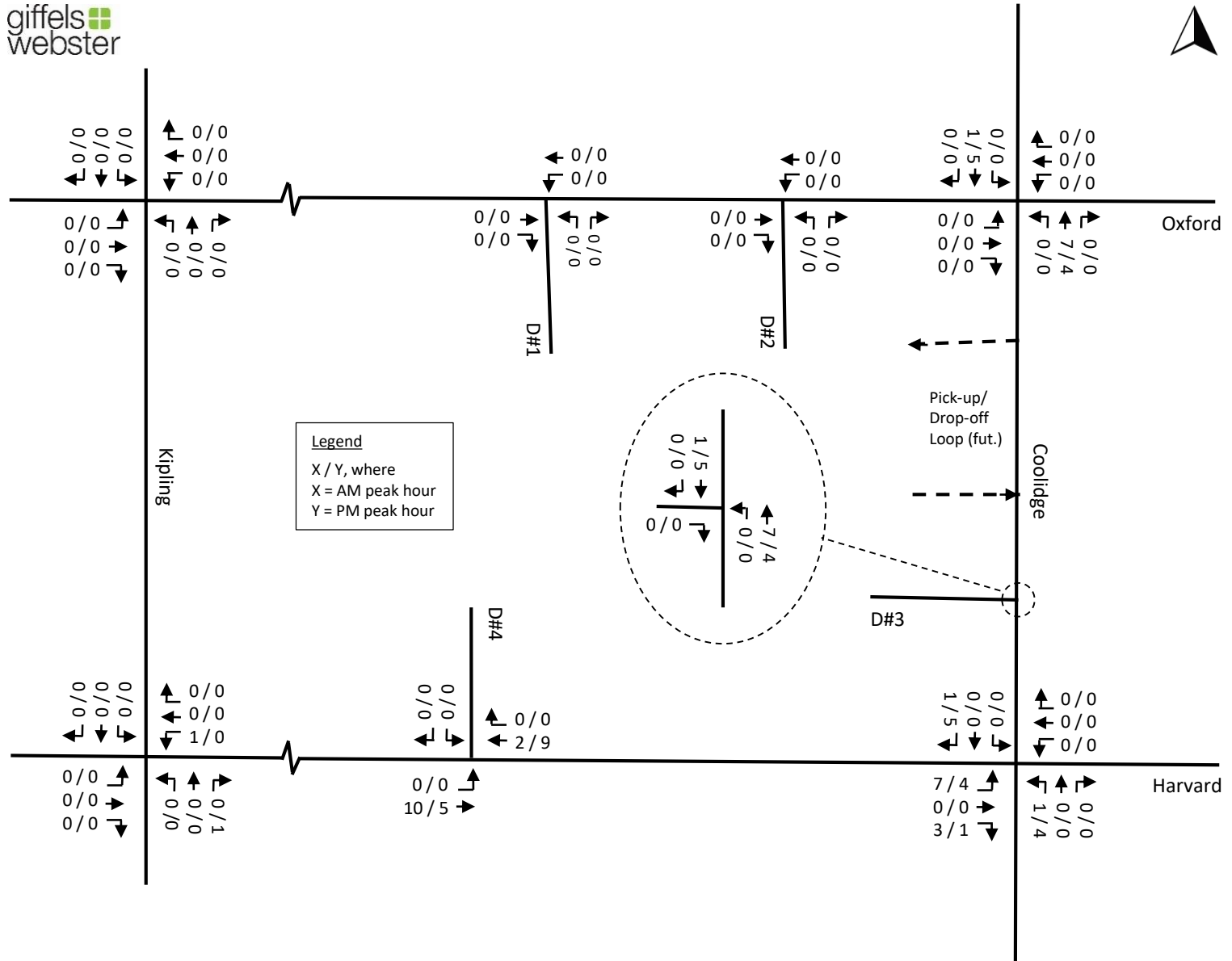
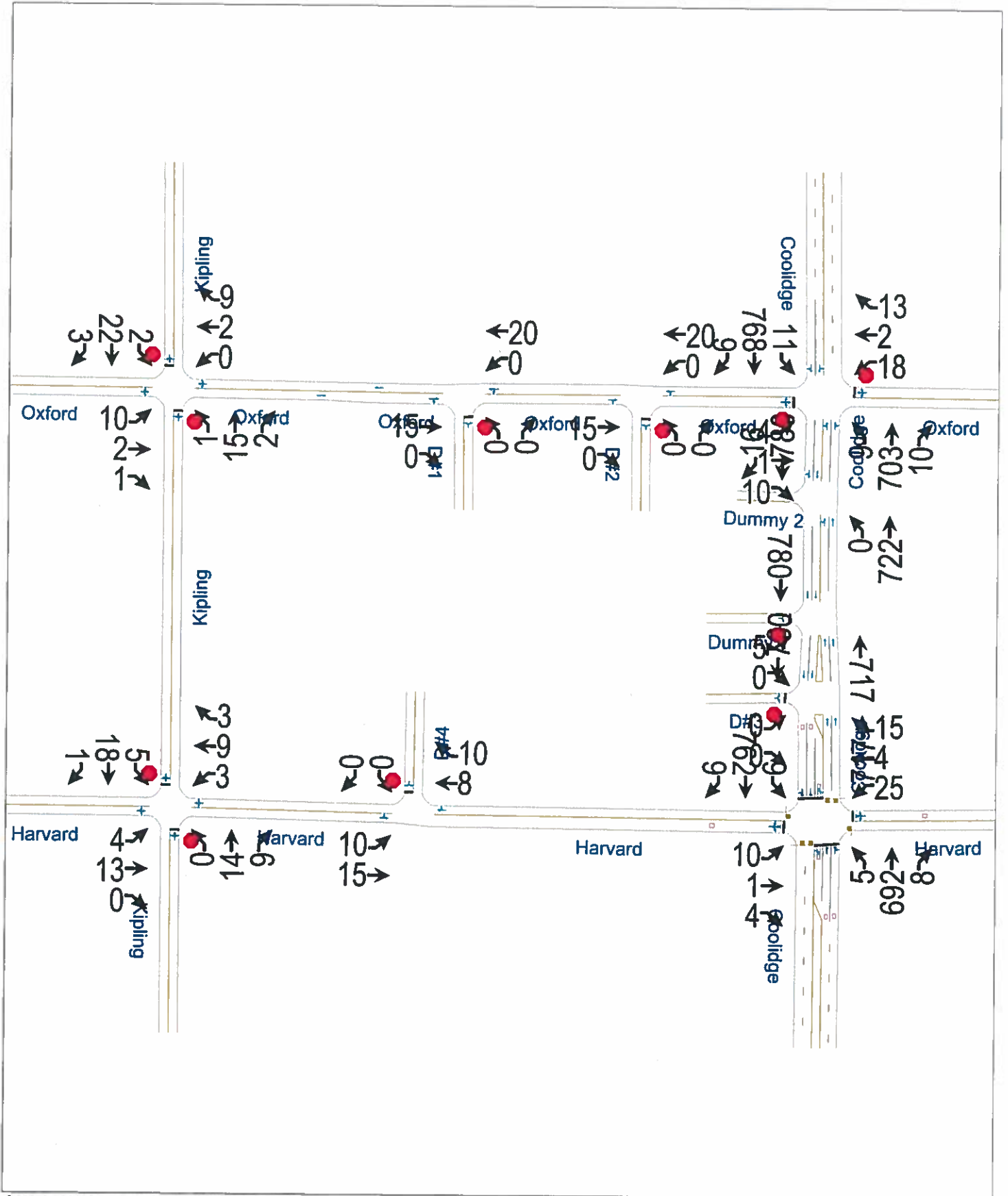


Figure D-2. Future Background Volumes Generated by Harvard Commons (West of D#4)

APPENDIX E:
LEVEL OF SERVICE ANALYSES

Current AM Peak Hour



Intersection

Int Delay, s/veh 7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	2	1	0	2	9	1	15	2	2	22	3
Future Vol, veh/h	10	2	1	0	2	9	1	15	2	2	22	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	60	60	60	64	64	64	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	2	1	0	3	15	2	23	3	3	29	4

Major/Minor	Major1	Major2	Minor1	Minor2								
Conflicting Flow All	18	0	0	4	0	0	56	46	3	52	39	11
Stage 1	-	-	-	-	-	-	28	28	-	11	11	-
Stage 2	-	-	-	-	-	-	28	18	-	41	28	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1599	-	-	1618	-	-	941	846	1081	947	853	1070
Stage 1	-	-	-	-	-	-	989	872	-	1010	886	-
Stage 2	-	-	-	-	-	-	989	880	-	974	872	-
Platoon blocked, %												
Mov Cap-1 Maneuver	1599	-	-	1618	-	-	907	839	1081	919	846	1070
Mov Cap-2 Maneuver	-	-	-	-	-	-	907	839	-	919	846	-
Stage 1	-	-	-	-	-	-	981	865	-	1002	886	-
Stage 2	-	-	-	-	-	-	953	880	-	937	865	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	5.6	0	9.3	9.3
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	864	1599	-	-	1618	-	-	871
HCM Lane V/C Ratio	0.033	0.008	-	-	-	-	-	0.041
HCM Control Delay (s)	9.3	7.3	0	-	0	-	-	9.3
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

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	4	1	10	18	2	13	9	703	10	11	768	9
Future Vol, veh/h	4	1	10	18	2	13	9	703	10	11	768	9
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	60	60	60	75	75	75	94	94	94	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	2	17	24	3	17	10	748	11	12	863	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1287	1671	437	1229	1670	379	873	0	0	759	0	0
Stage 1	893	893	-	772	772	-	-	-	-	-	-	-
Stage 2	394	778	-	457	898	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	121	95	567	134	95	619	768	-	-	848	-	-
Stage 1	303	358	-	358	407	-	-	-	-	-	-	-
Stage 2	602	405	-	553	356	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	111	90	567	123	90	619	768	-	-	848	-	-
Mov Cap-2 Maneuver	111	90	-	123	90	-	-	-	-	-	-	-
Stage 1	296	348	-	350	398	-	-	-	-	-	-	-
Stage 2	568	396	-	519	346	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	22.4	32.6	0.2	0.2
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	768	-	-	232	174	848	-	-
HCM Lane V/C Ratio	0.012	-	-	0.108	0.253	0.015	-	-
HCM Control Delay (s)	9.7	0.1	-	22.4	32.6	9.3	0.1	-
HCM Lane LOS	A	A	-	C	D	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	1	0	-	-

HCM 2010 Signalized Intersection Summary
15: Coolidge & Harvard

07/27/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕		↗	↕	
Traffic Volume (veh/h)	10	1	4	25	4	15	5	692	8	9	762	9
Future Volume (veh/h)	10	1	4	25	4	15	5	692	8	9	762	9
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	2080	2039	2080	2080	2039	2080	1961	1961	2000	1961	1961	2000
Adj Flow Rate, veh/h	17	2	7	32	5	19	5	744	9	10	819	10
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.60	0.60	0.60	0.79	0.79	0.79	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	415	59	147	368	70	189	362	1974	24	393	1974	24
Arrive On Green	0.34	0.34	0.34	0.34	0.34	0.34	0.52	0.52	0.52	0.52	0.52	0.52
Sat Flow, veh/h	1009	175	436	881	208	560	693	3770	46	745	3769	46
Grp Volume(v), veh/h	26	0	0	56	0	0	5	368	385	10	405	424
Grp Sat Flow(s), veh/h/ln	1620	0	0	1649	0	0	693	1863	1953	745	1863	1953
Q Serve(g_s), s	0.0	0.0	0.0	0.1	0.0	0.0	0.4	9.4	9.4	0.6	10.6	10.6
Cycle Q Clear(g_c), s	0.7	0.0	0.0	1.6	0.0	0.0	10.9	9.4	9.4	10.0	10.6	10.6
Prop In Lane	0.65		0.27	0.57		0.34	1.00		0.02	1.00		0.02
Lane Grp Cap(c), veh/h	621	0	0	627	0	0	362	976	1023	393	976	1023
V/C Ratio(X)	0.04	0.00	0.00	0.09	0.00	0.00	0.01	0.38	0.38	0.03	0.41	0.41
Avail Cap(c_a), veh/h	621	0	0	627	0	0	362	976	1023	393	976	1023
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	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	17.8	0.0	0.0	18.1	0.0	0.0	14.9	11.3	11.3	14.3	11.6	11.6
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.3	0.0	0.0	0.1	1.1	1.1	0.1	1.3	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.9	0.0	0.0	0.1	5.1	5.3	0.1	5.7	6.0
LnGrp Delay(d),s/veh	17.9	0.0	0.0	18.4	0.0	0.0	15.0	12.4	12.4	14.4	12.9	12.8
LnGrp LOS	B			B			B	B	B	B	B	B
Approach Vol, veh/h		26			56			758			839	
Approach Delay, s/veh		17.9			18.4			12.4			12.9	
Approach LOS		B			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		47.0		33.0		47.0		33.0				
Change Period (Y+Rc), s		* 5.1		6.0		* 5.1		6.0				
Max Green Setting (Gmax), s		* 42		27.0		* 42		27.0				
Max Q Clear Time (g_c+I1), s		12.9		2.7		12.6		3.6				
Green Ext Time (p_c), s		12.6		0.4		12.6		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay				12.9								
HCM 2010 LOS				B								
Notes												

Intersection

Int Delay, s/veh 1.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Vol, veh/h	10	15	8	10	0	0
Future Vol, veh/h	10	15	8	10	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	69	69	90	90	60	60
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	22	9	11	0	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	20	0	65
Stage 1	-	-	14
Stage 2	-	-	51
Critical Hdwy	4.12	-	6.42
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	2.218	-	3.518
Pot Cap-1 Maneuver	1596	-	941
Stage 1	-	-	1009
Stage 2	-	-	971
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1596	-	933
Mov Cap-2 Maneuver	-	-	933
Stage 1	-	-	1009
Stage 2	-	-	962

Approach	EB	WB	SB
HCM Control Delay, s	2.9	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1596	-	-	-	-
HCM Lane V/C Ratio	0.009	-	-	-	-
HCM Control Delay (s)	7.3	0	-	-	0
HCM Lane LOS	A	A	-	-	A
HCM 95th %ile Q(veh)	0	-	-	-	-

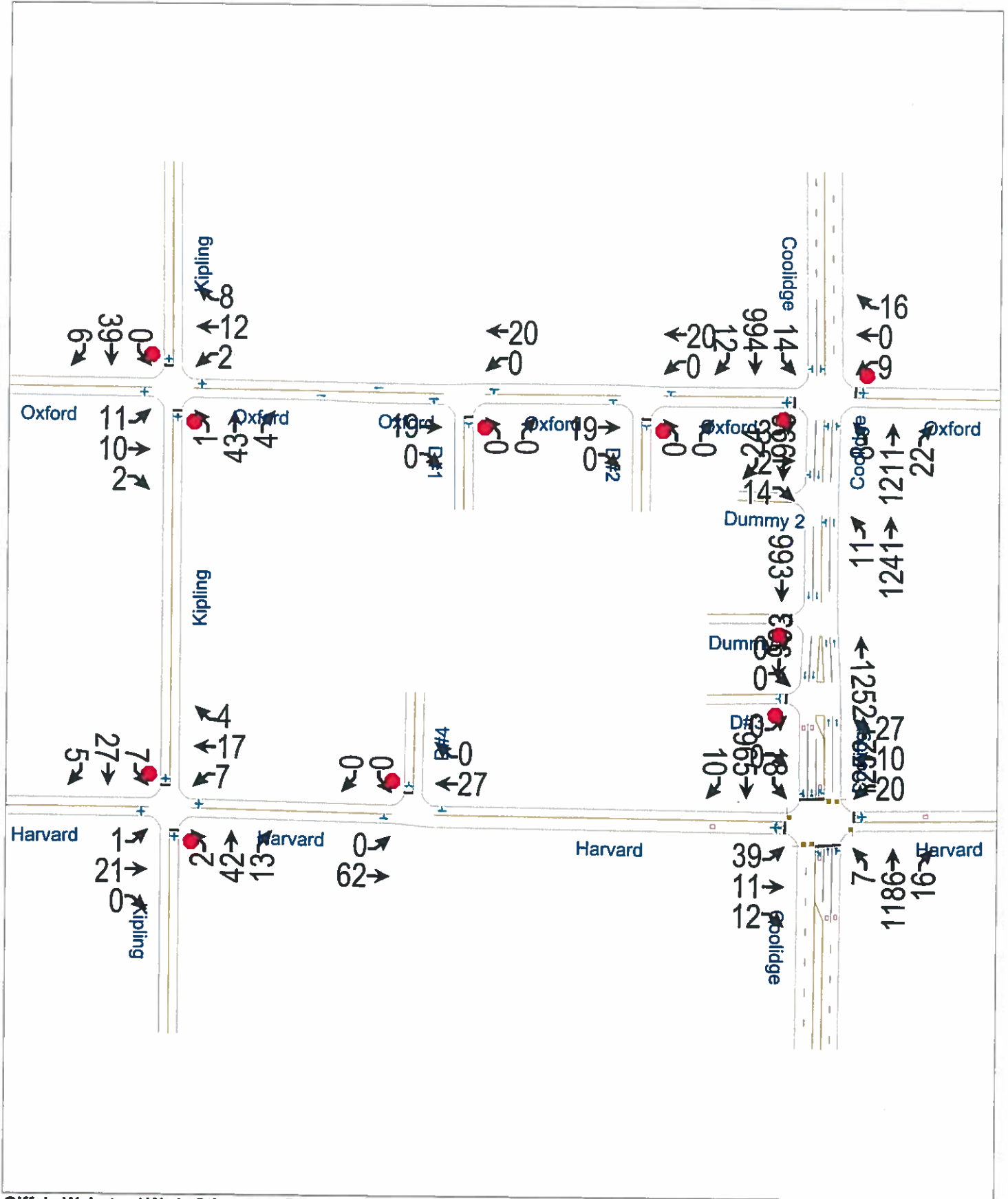
Intersection												
Int Delay, s/veh	6.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	13	0	3	9	3	0	14	9	5	18	1
Future Vol, veh/h	4	13	0	3	9	3	0	14	9	5	18	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	75	75	75	64	64	64	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	18	0	4	12	4	0	22	14	7	24	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	16	0	0	18	0	0	65	54	18	70	52	14
Stage 1	-	-	-	-	-	-	30	30	-	22	22	-
Stage 2	-	-	-	-	-	-	35	24	-	48	30	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1602	-	-	1599	-	-	929	837	1061	922	839	1066
Stage 1	-	-	-	-	-	-	987	870	-	996	877	-
Stage 2	-	-	-	-	-	-	981	875	-	965	870	-
Platoon blocked, %												
Mov Cap-1 Maneuver	1602	-	-	1599	-	-	903	831	1061	887	833	1066
Mov Cap-2 Maneuver	-	-	-	-	-	-	903	831	-	887	833	-
Stage 1	-	-	-	-	-	-	983	867	-	992	874	-
Stage 2	-	-	-	-	-	-	950	872	-	924	867	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.7	1.5	9.1	9.4
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	908	1602	-	-	1599	-	-	852
HCM Lane V/C Ratio	0.04	0.004	-	-	0.003	-	-	0.038
HCM Control Delay (s)	9.1	7.3	0	-	7.3	0	-	9.4
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Current PM Peak Hour



Intersection

Int Delay, s/veh 7.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	11	10	2	2	12	8	1	43	4	0	39	6
Future Vol, veh/h	11	10	2	2	12	8	1	43	4	0	39	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	72	72	72	69	69	69	67	67	67	60	60	60
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	14	3	3	17	12	1	64	6	0	65	10

Major/Minor	Major1	Major2	Minor1	Minor2								
Conflicting Flow All	29	0	0	17	0	0	112	81	15	110	76	23
Stage 1	-	-	-	-	-	-	46	46	-	29	29	-
Stage 2	-	-	-	-	-	-	66	35	-	81	47	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1584	-	-	1600	-	-	866	809	1065	868	814	1054
Stage 1	-	-	-	-	-	-	968	857	-	988	871	-
Stage 2	-	-	-	-	-	-	945	866	-	927	856	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1584	-	-	1600	-	-	797	799	1065	803	804	1054
Mov Cap-2 Maneuver	-	-	-	-	-	-	797	799	-	803	804	-
Stage 1	-	-	-	-	-	-	958	848	-	978	869	-
Stage 2	-	-	-	-	-	-	864	864	-	844	847	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.5	0.7	9.8	9.8
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	816	1584	-	-	1600	-	-	830
HCM Lane V/C Ratio	0.088	0.01	-	-	0.002	-	-	0.09
HCM Control Delay (s)	9.8	7.3	0	-	7.3	0	-	9.8
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.3

Intersection												
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Traffic Vol, veh/h	3	2	14	9	0	16	8	1211	22	14	994	12
Future Vol, veh/h	3	2	14	9	0	16	8	1211	22	14	994	12
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	68	68	68	89	89	89	96	96	96	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	3	21	10	0	18	8	1261	23	15	1057	13













Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1741	2395	535	1850	2390	642	1070	0	0	1284	0	0
Stage 1	1094	1094	-	1290	1290	-	-	-	-	-	-	-
Stage 2	647	1301	-	560	1100	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	56	33	490	46	33	417	647	-	-	536	-	-
Stage 1	228	288	-	173	232	-	-	-	-	-	-	-
Stage 2	426	229	-	480	286	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	49	29	490	37	29	417	647	-	-	536	-	-
Mov Cap-2 Maneuver	49	29	-	37	29	-	-	-	-	-	-	-
Stage 1	218	268	-	165	222	-	-	-	-	-	-	-
Stage 2	390	219	-	423	266	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	43.9	63.1	0.3	0.6
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	647	-	-	120	89	536	-	-
HCM Lane V/C Ratio	0.013	-	-	0.233	0.316	0.028	-	-
HCM Control Delay (s)	10.6	0.2	-	43.9	63.1	11.9	0.4	-
HCM Lane LOS	B	A	-	E	F	B	A	-
HCM 95th %tile Q(veh)	0	-	-	0.8	1.2	0.1	-	-

HCM 2010 Signalized Intersection Summary
 15: Coolidge & Harvard

07/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↘	↗		↘	↗	
Traffic Volume (veh/h)	39	11	12	20	10	27	7	1186	16	18	965	10
Future Volume (veh/h)	39	11	12	20	10	27	7	1186	16	18	965	10
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	2080	2039	2080	2080	2039	2080	1961	1961	2000	1961	1961	2000
Adj Flow Rate, veh/h	50	14	15	29	15	40	7	1235	17	20	1084	11
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.78	0.78	0.78	0.68	0.68	0.68	0.96	0.96	0.96	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	404	116	104	230	134	276	269	1971	27	225	1979	20
Arrive On Green	0.34	0.34	0.34	0.34	0.34	0.34	0.52	0.52	0.52	0.52	0.52	0.52
Sat Flow, veh/h	978	343	310	502	398	818	540	3763	52	465	3778	38
Grp Volume(v), veh/h	79	0	0	84	0	0	7	611	641	20	534	561
Grp Sat Flow(s),veh/h/ln	1630	0	0	1717	0	0	540	1863	1952	465	1863	1954
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.7	18.6	18.6	2.5	15.3	15.3
Cycle Q Clear(g_c), s	2.2	0.0	0.0	2.5	0.0	0.0	16.0	18.6	18.6	21.2	15.3	15.3
Prop In Lane	0.63		0.19	0.35		0.48	1.00		0.03	1.00		0.02
Lane Grp Cap(c), veh/h	624	0	0	640	0	0	269	976	1022	225	976	1023
V/C Ratio(X)	0.13	0.00	0.00	0.13	0.00	0.00	0.03	0.63	0.63	0.09	0.55	0.55
Avail Cap(c_a), veh/h	624	0	0	640	0	0	269	976	1022	225	976	1023
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	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	18.3	0.0	0.0	18.4	0.0	0.0	18.1	13.5	13.5	21.0	12.7	12.7
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.4	0.0	0.0	0.2	3.0	2.9	0.8	2.2	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	0.0	1.4	0.0	0.0	0.1	10.3	10.8	0.4	8.5	8.9
LnGrp Delay(d),s/veh	18.7	0.0	0.0	18.8	0.0	0.0	18.3	16.5	16.4	21.8	14.9	14.8
LnGrp LOS	B			B			B	B	B	C	B	B
Approach Vol, veh/h		79			84			1259			1115	
Approach Delay, s/veh		18.7			18.8			16.5			15.0	
Approach LOS		B			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		47.0		33.0		47.0		33.0				
Change Period (Y+Rc), s		* 5.1		6.0		* 5.1		6.0				
Max Green Setting (Gmax), s		* 42		27.0		* 42		27.0				
Max Q Clear Time (g_c+I1), s		20.6		4.2		23.2		4.5				
Green Ext Time (p_c), s		16.3		0.9		14.7		0.9				
Intersection Summary												
HCM 2010 Ctrl Delay				16.0								
HCM 2010 LOS				B								
Notes												

Intersection							
Int Delay, s/veh	0						
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations		4	1		2		
Traffic Vol, veh/h	0	62	27	0	0	0	
Future Vol, veh/h	0	62	27	0	0	0	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Stop	Stop	
RT Channelized	-	None	-	None	-	None	
Storage Length	-	-	-	-	0	-	
Veh in Median Storage, #	-	0	0	-	0	-	
Grade, %	-	0	0	-	0	-	
Peak Hour Factor	78	78	83	83	60	60	
Heavy Vehicles, %	2	2	2	2	2	2	
Mvmt Flow	0	79	33	0	0	0	

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	33	0	-	0	112	33
Stage 1	-	-	-	-	33	-
Stage 2	-	-	-	-	79	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1579	-	-	-	885	1041
Stage 1	-	-	-	-	989	-
Stage 2	-	-	-	-	944	-
Platoon blocked, %						
Mov Cap-1 Maneuver	1579	-	-	-	885	1041
Mov Cap-2 Maneuver	-	-	-	-	885	-
Stage 1	-	-	-	-	989	-
Stage 2	-	-	-	-	944	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1579	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection												
Int Delay, s/veh	6.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	21	0	7	17	4	2	42	13	7	27	5
Future Vol, veh/h	1	21	0	7	17	4	2	42	13	7	27	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	64	64	64	71	71	71	60	60	60
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	27	0	11	27	6	3	59	18	12	45	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	33	0	0	27	0	0	107	84	27	120	81	30
Stage 1	-	-	-	-	-	-	29	29	-	52	52	-
Stage 2	-	-	-	-	-	-	78	55	-	68	29	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1579	-	-	1587	-	-	872	806	1048	855	809	1044
Stage 1	-	-	-	-	-	-	988	871	-	961	852	-
Stage 2	-	-	-	-	-	-	931	849	-	942	871	-
Platoon blocked, %		-	-		-	-		-	-		-	-
Mov Cap-1 Maneuver	1579	-	-	1587	-	-	823	800	1048	788	803	1044
Mov Cap-2 Maneuver	-	-	-	-	-	-	823	800	-	788	803	-
Stage 1	-	-	-	-	-	-	987	870	-	960	846	-
Stage 2	-	-	-	-	-	-	868	843	-	862	870	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	1.8	9.7	9.7
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	847	1579	-	-	1587	-	-	825
HCM Lane V/C Ratio	0.095	0.001	-	-	0.007	-	-	0.079
HCM Control Delay (s)	9.7	7.3	0	-	7.3	0	-	9.7
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.3

Intersection

Int Delay, s/veh 7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	11	2	1	0	2	10	1	16	2	2	24	3
Future Vol, veh/h	11	2	1	0	2	10	1	16	2	2	24	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	60	60	60	64	64	64	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	2	1	0	3	17	2	25	3	3	32	4

Major/Minor	Major1	Major2	Minor1	Minor2								
Conflicting Flow All	20	0	0	4	0	0	60	50	3	56	43	12
Stage 1	-	-	-	-	-	-	30	30	-	12	12	-
Stage 2	-	-	-	-	-	-	30	20	-	44	31	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1596	-	-	1618	-	-	936	841	1081	941	849	1069
Stage 1	-	-	-	-	-	-	987	870	-	1009	886	-
Stage 2	-	-	-	-	-	-	987	879	-	970	869	-
Platoon blocked, %												
Mov Cap-1 Maneuver	1596	-	-	1618	-	-	899	833	1081	911	841	1069
Mov Cap-2 Maneuver	-	-	-	-	-	-	899	833	-	911	841	-
Stage 1	-	-	-	-	-	-	978	862	-	1000	886	-
Stage 2	-	-	-	-	-	-	948	879	-	931	861	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	5.7	0	9.4	9.4
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	857	1596	-	-	1618	-	-	865
HCM Lane V/C Ratio	0.035	0.009	-	-	-	-	-	0.045
HCM Control Delay (s)	9.4	7.3	0	-	0	-	-	9.4
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Traffic Vol, veh/h	4	1	11	19	2	14	10	766	11	12	830	10
Future Vol, veh/h	4	1	11	19	2	14	10	766	11	12	830	10
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	60	60	60	75	75	75	94	94	94	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	2	18	25	3	19	11	815	12	13	933	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1395	1813	472	1336	1813	413	944	0	0	827	0	0
Stage 1	965	965	-	842	842	-	-	-	-	-	-	-
Stage 2	430	848	-	494	971	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	101	78	538	112	78	588	722	-	-	800	-	-
Stage 1	274	331	-	325	378	-	-	-	-	-	-	-
Stage 2	574	376	-	526	329	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	91	73	538	101	73	588	722	-	-	800	-	-
Mov Cap-2 Maneuver	91	73	-	101	73	-	-	-	-	-	-	-
Stage 1	266	320	-	316	367	-	-	-	-	-	-	-
Stage 2	536	365	-	488	318	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	25.2	40.8	0.2	0.3
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	722	-	-	205	146	800	-	-
HCM Lane V/C Ratio	0.015	-	-	0.13	0.32	0.017	-	-
HCM Control Delay (s)	10.1	0.1	-	25.2	40.8	9.6	0.2	-
HCM Lane LOS	B	A	-	D	E	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	1.3	0.1	-	-

HCM 2010 Signalized Intersection Summary
15: Coolidge & Harvard

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕		↗	↕	
Traffic Volume (veh/h)	18	1	7	27	4	16	6	747	9	10	823	11
Future Volume (veh/h)	18	1	7	27	4	16	6	747	9	10	823	11
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	2080	2039	2080	2080	2039	2080	1961	1961	2000	1961	1961	2000
Adj Flow Rate, veh/h	30	2	12	34	5	20	6	803	10	11	885	12
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.60	0.60	0.60	0.79	0.79	0.79	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	430	40	148	370	67	188	336	1974	25	368	1971	27
Arrive On Green	0.34	0.34	0.34	0.34	0.34	0.34	0.52	0.52	0.52	0.52	0.52	0.52
Sat Flow, veh/h	1051	119	439	886	200	557	651	3768	47	704	3763	51
Grp Volume(v), veh/h	44	0	0	59	0	0	6	397	416	11	438	459
Grp Sat Flow(s),veh/h/ln	1609	0	0	1643	0	0	651	1863	1953	704	1863	1952
Q Serve(g_s), s	0.0	0.0	0.0	0.2	0.0	0.0	0.5	10.3	10.3	0.8	11.7	11.7
Cycle Q Clear(g_c), s	1.2	0.0	0.0	1.7	0.0	0.0	12.2	10.3	10.3	11.1	11.7	11.7
Prop In Lane	0.68		0.27	0.58		0.34	1.00		0.02	1.00		0.03
Lane Grp Cap(c), veh/h	619	0	0	625	0	0	336	976	1023	368	976	1022
V/C Ratio(X)	0.07	0.00	0.00	0.09	0.00	0.00	0.02	0.41	0.41	0.03	0.45	0.45
Avail Cap(c_a), veh/h	619	0	0	625	0	0	336	976	1023	368	976	1022
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	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	18.0	0.0	0.0	18.1	0.0	0.0	15.7	11.5	11.5	14.9	11.9	11.9
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.3	0.0	0.0	0.1	1.3	1.2	0.2	1.5	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	0.9	0.0	0.0	0.1	5.6	5.9	0.2	6.4	6.7
LnGrp Delay(d),s/veh	18.2	0.0	0.0	18.4	0.0	0.0	15.8	12.8	12.7	15.0	13.4	13.3
LnGrp LOS	B			B			B	B	B	B	B	B
Approach Vol, veh/h		44			59			819			908	
Approach Delay, s/veh		18.2			18.4			12.8			13.3	
Approach LOS		B			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		47.0		33.0		47.0		33.0				
Change Period (Y+Rc), s		* 5.1		6.0		* 5.1		6.0				
Max Green Setting (Gmax), s		* 42		27.0		* 42		27.0				
Max Q Clear Time (g_c+I1), s		14.2		3.2		13.7		3.7				
Green Ext Time (p_c), s		13.6		0.5		13.8		0.5				
Intersection Summary												
HCM 2010 Ctrl Delay				13.4								
HCM 2010 LOS				B								
Notes												

Intersection

Int Delay, s/veh 1.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		4	4		4	
Traffic Vol, veh/h	10	26	11	10	0	0
Future Vol, veh/h	10	26	11	10	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	69	69	90	90	60	60
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	38	12	11	0	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	23	0	85
Stage 1	-	-	18
Stage 2	-	-	67
Critical Hdwy	4.12	-	6.42
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	2.218	-	3.518
Pot Cap-1 Maneuver	1592	-	916
Stage 1	-	-	1005
Stage 2	-	-	956
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1592	-	908
Mov Cap-2 Maneuver	-	-	908
Stage 1	-	-	1005
Stage 2	-	-	947

Approach	EB	WB	SB
HCM Control Delay, s	2	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1592	-	-	-	-
HCM Lane V/C Ratio	0.009	-	-	-	-
HCM Control Delay (s)	7.3	0	-	-	0
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

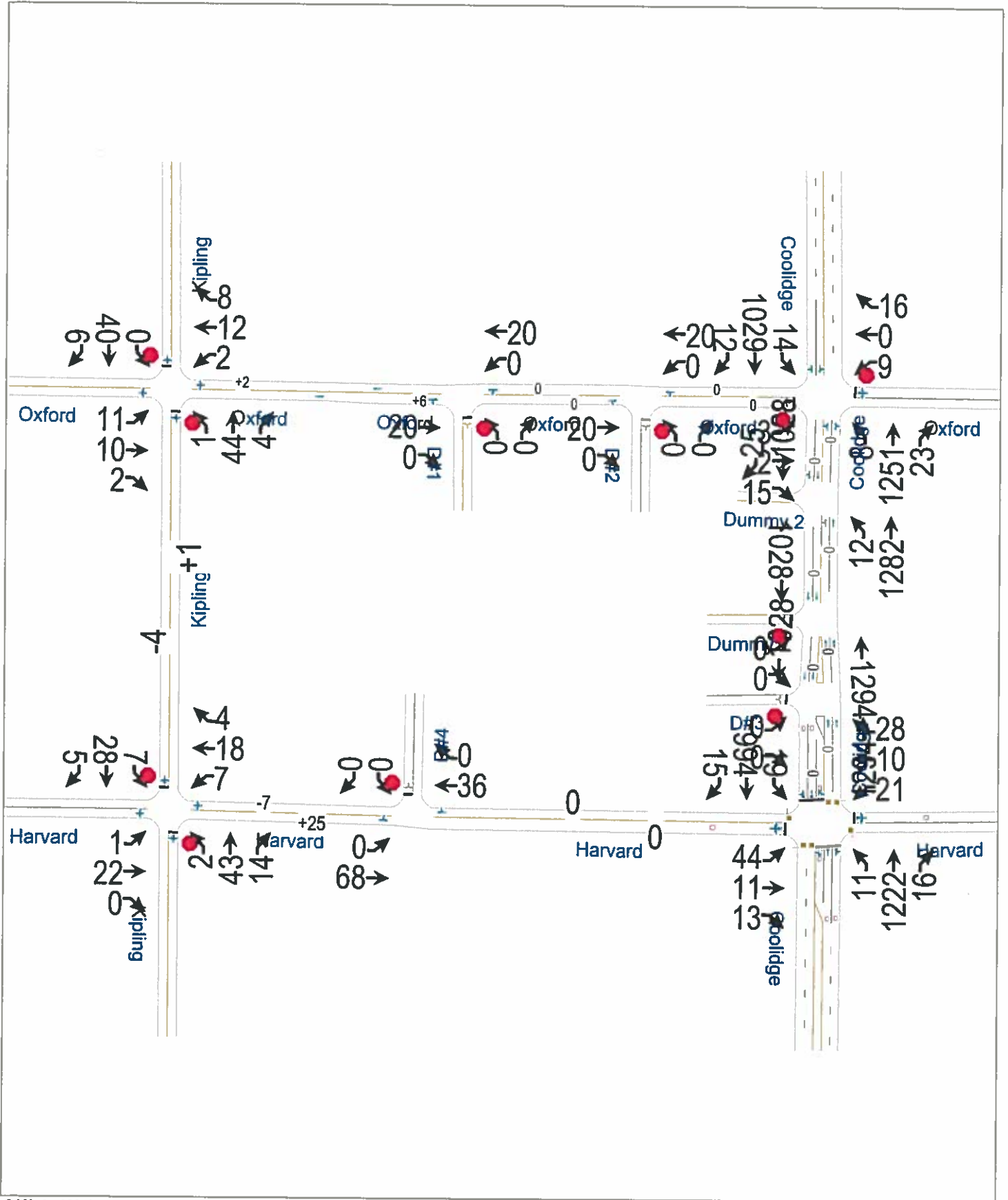
Intersection												
Int Delay, s/veh	6.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	14	0	4	10	3	0	15	10	5	19	1
Future Vol, veh/h	4	14	0	4	10	3	0	15	10	5	19	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	75	75	75	64	64	64	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	20	0	5	13	4	0	23	16	7	25	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	17	0	0	20	0	0	70	59	20	77	57	15
Stage 1	-	-	-	-	-	-	31	31	-	26	26	-
Stage 2	-	-	-	-	-	-	39	28	-	51	31	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1600	-	-	1596	-	-	922	832	1058	912	834	1065
Stage 1	-	-	-	-	-	-	986	869	-	992	874	-
Stage 2	-	-	-	-	-	-	976	872	-	962	869	-
Platoon blocked, %		-	-		-	-		-	-		-	-
Mov Cap-1 Maneuver	1600	-	-	1596	-	-	895	826	1058	874	828	1065
Mov Cap-2 Maneuver	-	-	-	-	-	-	895	826	-	874	828	-
Stage 1	-	-	-	-	-	-	982	866	-	988	871	-
Stage 2	-	-	-	-	-	-	944	869	-	918	866	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.6	1.7	9.2	9.4
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	905	1600	-	-	1596	-	-	844
HCM Lane V/C Ratio	0.043	0.004	-	-	0.003	-	-	0.039
HCM Control Delay (s)	9.2	7.3	0	-	7.3	0	-	9.4
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Future Background PM Peak Hour



Intersection												
Int Delay, s/veh	7.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	11	10	2	2	12	8	1	44	4	0	40	6
Future Vol, veh/h	11	10	2	2	12	8	1	44	4	0	40	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	72	72	72	69	69	69	67	67	67	60	60	60
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	14	3	3	17	12	1	66	6	0	67	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	29	0	0	17	0	0	113	81	15	111	76	23
Stage 1	-	-	-	-	-	-	46	46	-	29	29	-
Stage 2	-	-	-	-	-	-	67	35	-	82	47	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1584	-	-	1600	-	-	864	809	1065	867	814	1054
Stage 1	-	-	-	-	-	-	968	857	-	988	871	-
Stage 2	-	-	-	-	-	-	943	866	-	926	856	-
Platoon blocked, %		-	-		-	-		-	-		-	-
Mov Cap-1 Maneuver	1584	-	-	1600	-	-	794	799	1065	801	804	1054
Mov Cap-2 Maneuver	-	-	-	-	-	-	794	799	-	801	804	-
Stage 1	-	-	-	-	-	-	958	848	-	978	869	-
Stage 2	-	-	-	-	-	-	861	864	-	841	847	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.5	0.7	9.8	9.8
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	816	1584	-	-	1600	-	-	830
HCM Lane V/C Ratio	0.09	0.01	-	-	0.002	-	-	0.092
HCM Control Delay (s)	9.8	7.3	0	-	7.3	0	-	9.8
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.3

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕			↕		
Traffic Vol, veh/h	3	2	15	9	0	16	8	1251	23	14	1029	12
Future Vol, veh/h	3	2	15	9	0	16	8	1251	23	14	1029	12
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	68	68	68	89	89	89	96	96	96	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	3	22	10	0	18	8	1303	24	15	1095	13

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1799	2475	554	1911	2469	664	1107	0	0	1327	0	0
Stage 1	1131	1131	-	1332	1332	-	-	-	-	-	-	-
Stage 2	668	1344	-	579	1137	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	50	29	476	41	30	403	626	-	-	516	-	-
Stage 1	217	277	-	163	222	-	-	-	-	-	-	-
Stage 2	414	219	-	468	275	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	43	25	476	32	26	403	626	-	-	516	-	-
Mov Cap-2 Maneuver	43	25	-	32	26	-	-	-	-	-	-	-
Stage 1	206	256	-	155	211	-	-	-	-	-	-	-
Stage 2	376	208	-	408	254	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	49.3	75.1	0.4	0.6
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	626	-	-	110	78	516	-	-
HCM Lane V/C Ratio	0.013	-	-	0.267	0.36	0.029	-	-
HCM Control Delay (s)	10.8	0.3	-	49.3	75.1	12.2	0.5	-
HCM Lane LOS	B	A	-	E	F	B	A	-
HCM 95th %tile Q(veh)	0	-	-	1	1.4	0.1	-	-

HCM 2010 Signalized Intersection Summary
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕		↗	↕	
Traffic Volume (veh/h)	44	11	13	21	10	28	11	1222	16	19	994	15
Future Volume (veh/h)	44	11	13	21	10	28	11	1222	16	19	994	15
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	2080	2039	2080	2080	2039	2080	1961	1961	2000	1961	1961	2000
Adj Flow Rate, veh/h	56	14	17	31	15	41	11	1273	17	21	1117	17
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.78	0.78	0.78	0.68	0.68	0.68	0.96	0.96	0.96	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	409	106	107	237	130	272	258	1972	26	216	1967	30
Arrive On Green	0.34	0.34	0.34	0.34	0.34	0.34	0.52	0.52	0.52	0.52	0.52	0.52
Sat Flow, veh/h	994	313	317	520	385	806	520	3764	50	449	3756	57
Grp Volume(v), veh/h	87	0	0	87	0	0	11	630	660	21	554	580
Grp Sat Flow(s),veh/h/ln	1625	0	0	1711	0	0	520	1863	1952	449	1863	1951
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	1.2	19.5	19.5	2.8	16.1	16.1
Cycle Q Clear(g_c), s	2.4	0.0	0.0	2.6	0.0	0.0	17.3	19.5	19.5	22.3	16.1	16.1
Prop In Lane	0.64		0.20	0.36		0.47	1.00		0.03	1.00		0.03
Lane Grp Cap(c), veh/h	622	0	0	639	0	0	258	976	1022	216	976	1022
V/C Ratio(X)	0.14	0.00	0.00	0.14	0.00	0.00	0.04	0.65	0.65	0.10	0.57	0.57
Avail Cap(c_a), veh/h	622	0	0	639	0	0	258	976	1022	216	976	1022
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	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	18.4	0.0	0.0	18.4	0.0	0.0	18.8	13.7	13.7	21.7	12.9	12.9
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.4	0.0	0.0	0.3	3.3	3.1	0.9	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	1.4	0.0	0.0	1.4	0.0	0.0	0.2	10.9	11.3	0.4	8.8	9.2
LnGrp Delay(d),s/veh	18.8	0.0	0.0	18.9	0.0	0.0	19.1	17.0	16.9	22.6	15.3	15.2
LnGrp LOS	B			B			B	B	B	C	B	B
Approach Vol, veh/h		87			87			1301			1155	
Approach Delay, s/veh		18.8			18.9			16.9			15.4	
Approach LOS		B			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		47.0		33.0		47.0		33.0				
Change Period (Y+Rc), s		* 5.1		6.0		* 5.1		6.0				
Max Green Setting (Gmax), s		* 42		27.0		* 42		27.0				
Max Q Clear Time (g_c+l1), s		21.5		4.4		24.3		4.6				
Green Ext Time (p_c), s		16.2		1.0		14.3		1.0				
Intersection Summary												
HCM 2010 Ctrl Delay				16.4								
HCM 2010 LOS				B								
Notes												

Intersection

Int Delay, s/veh 0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↔		↕	
Traffic Vol, veh/h	0	68	36	0	0	0
Future Vol, veh/h	0	68	36	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	78	78	83	83	60	60
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	87	43	0	0	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	43	0	43
Stage 1	-	-	43
Stage 2	-	-	87
Critical Hdwy	4.12	-	6.22
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	2.218	-	3.318
Pot Cap-1 Maneuver	1566	-	1027
Stage 1	-	-	979
Stage 2	-	-	936
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1566	-	1027
Mov Cap-2 Maneuver	-	-	864
Stage 1	-	-	979
Stage 2	-	-	936

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1566	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

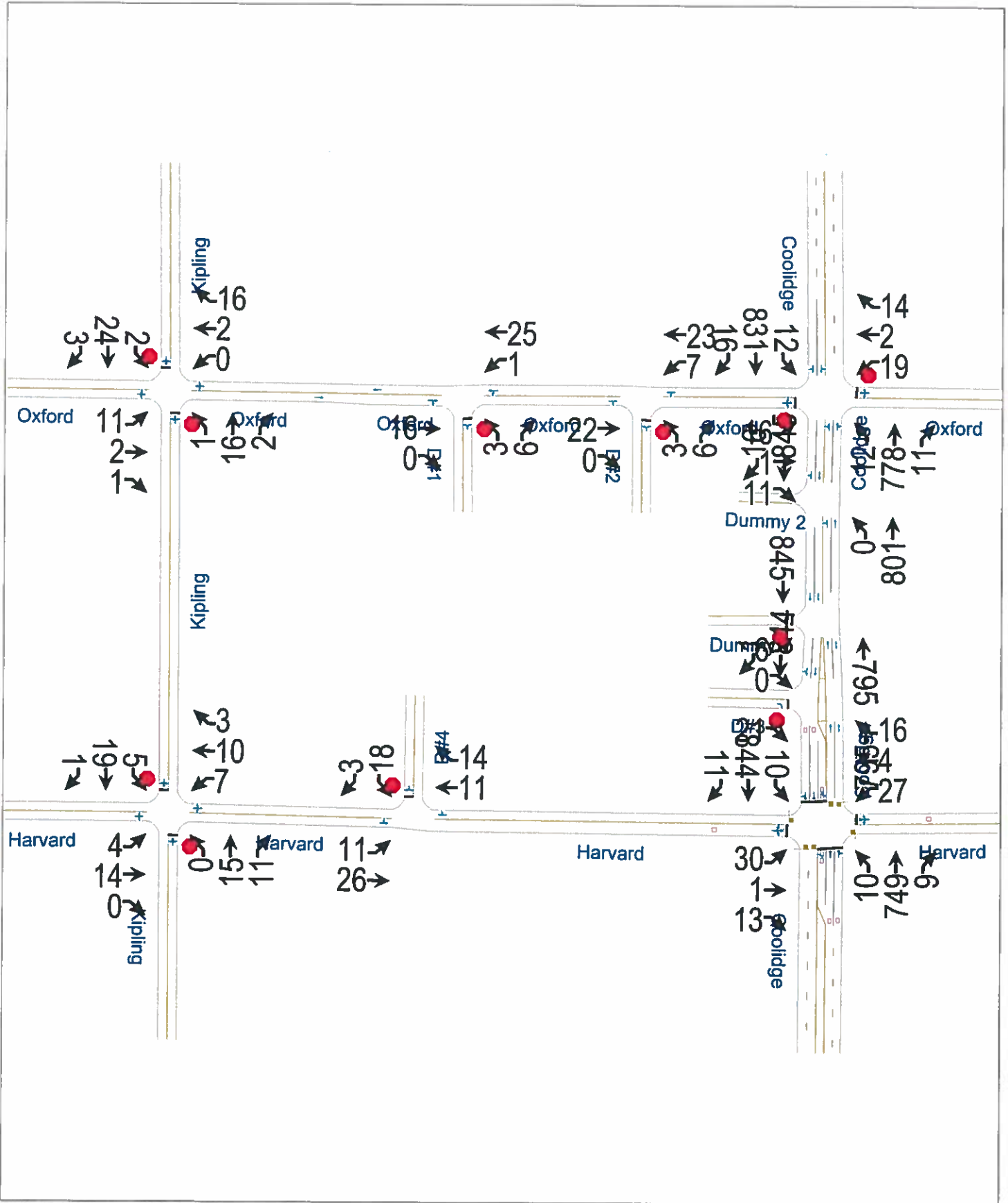
Intersection												
Int Delay, s/veh	6.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	22	0	7	18	4	2	43	14	7	28	5
Future Vol, veh/h	1	22	0	7	18	4	2	43	14	7	28	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	64	64	64	71	71	71	60	60	60
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	28	0	11	28	6	3	61	20	12	47	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	34	0	0	28	0	0	111	86	28	124	83	31
Stage 1	-	-	-	-	-	-	30	30	-	53	53	-
Stage 2	-	-	-	-	-	-	81	56	-	71	30	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1578	-	-	1585	-	-	867	804	1047	850	807	1043
Stage 1	-	-	-	-	-	-	987	870	-	960	851	-
Stage 2	-	-	-	-	-	-	927	848	-	939	870	-
Platoon blocked, %		-	-		-	-		-	-		-	-
Mov Cap-1 Maneuver	1578	-	-	1585	-	-	817	798	1047	781	801	1043
Mov Cap-2 Maneuver	-	-	-	-	-	-	817	798	-	781	801	-
Stage 1	-	-	-	-	-	-	986	869	-	959	845	-
Stage 2	-	-	-	-	-	-	863	842	-	856	869	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	1.8	9.7	9.8
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	846	1578	-	-	1585	-	-	821
HCM Lane V/C Ratio	0.098	0.001	-	-	0.007	-	-	0.081
HCM Control Delay (s)	9.7	7.3	0	-	7.3	0	-	9.8
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %ile Q(veh)	0.3	0	-	-	0	-	-	0.3

Future Total AM Peak Hour



Intersection

Int Delay, s/veh 6.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	11	2	1	0	2	16	1	16	2	2	24	3
Future Vol, veh/h	11	2	1	0	2	16	1	16	2	2	24	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	60	60	60	64	64	64	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	2	1	0	3	27	2	25	3	3	32	4

Major/Minor	Major1	Major2	Minor1	Minor2								
Conflicting Flow All	30	0	0	4	0	0	65	60	3	61	48	17
Stage 1	-	-	-	-	-	-	30	30	-	17	17	-
Stage 2	-	-	-	-	-	-	35	30	-	44	31	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1583	-	-	1618	-	-	929	831	1081	934	844	1062
Stage 1	-	-	-	-	-	-	987	870	-	1002	881	-
Stage 2	-	-	-	-	-	-	981	870	-	970	869	-
Platoon blocked, %												
Mov Cap-1 Maneuver	1583	-	-	1618	-	-	892	824	1081	904	836	1062
Mov Cap-2 Maneuver	-	-	-	-	-	-	892	824	-	904	836	-
Stage 1	-	-	-	-	-	-	978	862	-	993	881	-
Stage 2	-	-	-	-	-	-	942	870	-	931	861	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	5.7	0	9.4	9.4
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	849	1583	-	-	1618	-	-	859
HCM Lane V/C Ratio	0.035	0.009	-	-	-	-	-	0.045
HCM Control Delay (s)	9.4	7.3	0	-	0	-	-	9.4
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection

Int Delay, s/veh 1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	
Traffic Vol, veh/h	16	0	1	25	3	6
Future Vol, veh/h	16	0	1	25	3	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	60	60	64	64	60	60
Heavy Vehicles, %	2	0	0	2	0	0
Mvmt Flow	27	0	2	39	5	10

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	27
Stage 1	-	-	27
Stage 2	-	-	42
Critical Hdwy	-	4.1	6.4
Critical Hdwy Stg 1	-	-	5.4
Critical Hdwy Stg 2	-	-	5.4
Follow-up Hdwy	-	2.2	3.5
Pot Cap-1 Maneuver	-	1600	941
Stage 1	-	-	1001
Stage 2	-	-	986
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	1600	940
Mov Cap-2 Maneuver	-	-	940
Stage 1	-	-	1001
Stage 2	-	-	985

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	8.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1013	-	-	1600	-
HCM Lane V/C Ratio	0.015	-	-	0.001	-
HCM Control Delay (s)	8.6	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection

Int Delay, s/veh 2.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	1			1	1	
Traffic Vol, veh/h	22	0	7	23	3	6
Future Vol, veh/h	22	0	7	23	3	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	60	60	64	64	60	60
Heavy Vehicles, %	2	0	0	2	0	0
Mvmt Flow	37	0	11	36	5	10

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	37
Stage 1	-	-	37
Stage 2	-	-	58
Critical Hdwy	-	4.1	6.4
Critical Hdwy Stg 1	-	-	5.4
Critical Hdwy Stg 2	-	-	5.4
Follow-up Hdwy	-	2.2	3.5
Pot Cap-1 Maneuver	-	1587	909
Stage 1	-	-	991
Stage 2	-	-	970
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	1587	903
Mov Cap-2 Maneuver	-	-	903
Stage 1	-	-	991
Stage 2	-	-	963

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	8.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	991	-	-	1587	-
HCM Lane V/C Ratio	0.015	-	-	0.007	-
HCM Control Delay (s)	8.7	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

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	16	1	11	19	2	14	12	778	11	12	831	16
Future Vol, veh/h	16	1	11	19	2	14	12	778	11	12	831	16
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	60	60	60	75	75	75	94	94	94	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	2	18	25	3	19	13	828	12	13	934	18

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1411	1835	476	1354	1838	420	952	0	0	839	0	0
Stage 1	970	970	-	859	859	-	-	-	-	-	-	-
Stage 2	441	865	-	495	979	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	98	75	535	108	75	582	717	-	-	791	-	-
Stage 1	272	330	-	317	371	-	-	-	-	-	-	-
Stage 2	565	369	-	525	326	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	87	70	535	97	70	582	717	-	-	791	-	-
Mov Cap-2 Maneuver	87	70	-	97	70	-	-	-	-	-	-	-
Stage 1	263	318	-	306	358	-	-	-	-	-	-	-
Stage 2	524	356	-	487	315	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	48.4	42.7	0.3	0.3
HCM LOS	E	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	717	-	-	128	141	791	-	-
HCM Lane V/C Ratio	0.018	-	-	0.365	0.331	0.017	-	-
HCM Control Delay (s)	10.1	0.2	-	48.4	42.7	9.6	0.2	-
HCM Lane LOS	B	A	-	E	E	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.5	1.3	0.1	-	-

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↗↗	↗↗	
Traffic Vol, veh/h	0	21	0	795	844	1
Future Vol, veh/h	0	21	0	795	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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	23	0	864	917	1

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	459	- 0
Stage 1	-	-	- -
Stage 2	-	-	- -
Critical Hdwy	-	6.94	- -
Critical Hdwy Stg 1	-	-	- -
Critical Hdwy Stg 2	-	-	- -
Follow-up Hdwy	-	3.32	- -
Pot Cap-1 Maneuver	0	549	0 -
Stage 1	0	-	0 -
Stage 2	0	-	0 -
Platoon blocked, %			- -
Mov Cap-1 Maneuver	-	549	- -
Mov Cap-2 Maneuver	-	-	- -
Stage 1	-	-	- -
Stage 2	-	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	11.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	549	-	-
HCM Lane V/C Ratio	-	0.042	-	-
HCM Control Delay (s)	-	11.8	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

HCM 2010 Signalized Intersection Summary
15: Coolidge & Harvard

07/28/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕↗		↗	↕↗	
Traffic Volume (veh/h)	30	1	13	27	4	16	10	749	9	10	844	11
Future Volume (veh/h)	30	1	13	27	4	16	10	749	9	10	844	11
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	2080	2039	2080	2080	2039	2080	1961	1961	2000	1961	1961	2000
Adj Flow Rate, veh/h	50	2	22	34	5	20	11	805	10	11	908	12
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.60	0.60	0.60	0.79	0.79	0.79	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	426	30	161	370	67	188	327	1974	25	367	1972	26
Arrive On Green	0.34	0.34	0.34	0.34	0.34	0.34	0.52	0.52	0.52	0.52	0.52	0.52
Sat Flow, veh/h	1038	90	477	887	200	557	637	3768	47	703	3765	50
Grp Volume(v), veh/h	74	0	0	59	0	0	11	398	417	11	449	471
Grp Sat Flow(s),veh/h/ln	1605	0	0	1644	0	0	637	1863	1953	703	1863	1952
Q Serve(g_s), s	0.5	0.0	0.0	0.0	0.0	0.0	0.9	10.3	10.4	0.8	12.1	12.1
Cycle Q Clear(g_c), s	2.2	0.0	0.0	1.7	0.0	0.0	13.0	10.3	10.4	11.1	12.1	12.1
Prop In Lane	0.68		0.30	0.58		0.34	1.00		0.02	1.00		0.03
Lane Grp Cap(c), veh/h	617	0	0	626	0	0	327	976	1023	367	976	1022
VC Ratio(X)	0.12	0.00	0.00	0.09	0.00	0.00	0.03	0.41	0.41	0.03	0.46	0.46
Avail Cap(c_a), veh/h	617	0	0	626	0	0	327	976	1023	367	976	1022
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	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	18.3	0.0	0.0	18.1	0.0	0.0	16.0	11.5	11.5	14.9	12.0	12.0
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.3	0.0	0.0	0.2	1.3	1.2	0.2	1.6	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.0	0.9	0.0	0.0	0.2	5.6	5.9	0.2	6.5	6.8
LnGrp Delay(d),s/veh	18.7	0.0	0.0	18.4	0.0	0.0	16.2	12.8	12.7	15.1	13.5	13.4
LnGrp LOS	B			B			B	B	B	B	B	B
Approach Vol, veh/h		74			59			826			931	
Approach Delay, s/veh		18.7			18.4			12.8			13.5	
Approach LOS		B			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		47.0		33.0		47.0		33.0				
Change Period (Y+Rc), s		* 5.1		6.0		* 5.1		6.0				
Max Green Setting (Gmax), s		* 42		27.0		* 42		27.0				
Max Q Clear Time (g_c+I1), s		15.0		4.2		14.1		3.7				
Green Ext Time (p_c), s		13.7		0.7		14.0		0.7				
Intersection Summary												
HCM 2010 Ctrl Delay				13.6								
HCM 2010 LOS				B								
Notes												

Intersection

Int Delay, s/veh 3.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↔		↕	
Traffic Vol, veh/h	11	26	11	14	18	3
Future Vol, veh/h	11	26	11	14	18	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	69	69	90	90	60	60
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	38	12	16	30	5

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	28	0	90
Stage 1	-	-	20
Stage 2	-	-	70
Critical Hdwy	4.12	-	6.42
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	2.218	-	3.518
Pot Cap-1 Maneuver	1585	-	910
Stage 1	-	-	1003
Stage 2	-	-	953
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1585	-	901
Mov Cap-2 Maneuver	-	-	901
Stage 1	-	-	1003
Stage 2	-	-	943

Approach	EB	WB	SB
HCM Control Delay, s	2.2	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1585	-	-	-	921
HCM Lane V/C Ratio	0.01	-	-	-	0.038
HCM Control Delay (s)	7.3	0	-	-	9.1
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

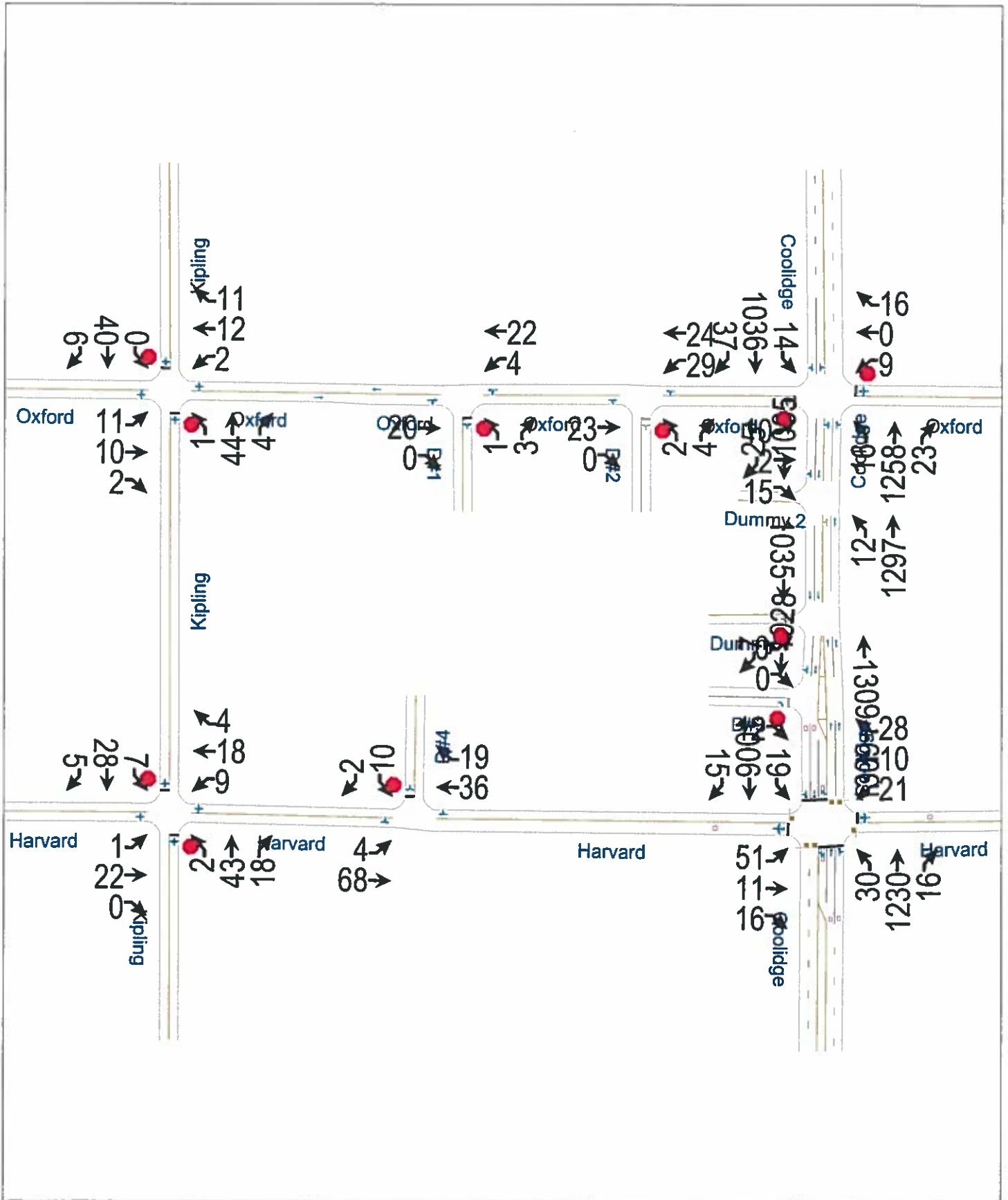
Intersection												
Int Delay, s/veh	6.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	14	0	7	10	3	0	15	11	5	19	1
Future Vol, veh/h	4	14	0	7	10	3	0	15	11	5	19	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	75	75	75	64	64	64	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	20	0	9	13	4	0	23	17	7	25	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	17	0	0	20	0	0	78	67	20	85	65	15
Stage 1	-	-	-	-	-	-	31	31	-	34	34	-
Stage 2	-	-	-	-	-	-	47	36	-	51	31	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1600	-	-	1596	-	-	911	824	1058	901	826	1065
Stage 1	-	-	-	-	-	-	986	869	-	982	867	-
Stage 2	-	-	-	-	-	-	967	865	-	962	869	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1600	-	-	1596	-	-	882	816	1058	860	818	1065
Mov Cap-2 Maneuver	-	-	-	-	-	-	882	816	-	860	818	-
Stage 1	-	-	-	-	-	-	982	866	-	978	862	-
Stage 2	-	-	-	-	-	-	932	860	-	917	866	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.6	2.5	9.2	9.5
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	903	1600	-	-	1596	-	-	834
HCM Lane V/C Ratio	0.045	0.004	-	-	0.006	-	-	0.04
HCM Control Delay (s)	9.2	7.3	0	-	7.3	0	-	9.5
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Future Total PM Peak Hour



Intersection												
Int Delay, s/veh	7.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	11	10	2	2	12	11	1	44	4	0	40	6
Future Vol, veh/h	11	10	2	2	12	11	1	44	4	0	40	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	72	72	72	69	69	69	67	67	67	60	60	60
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	14	3	3	17	16	1	66	6	0	67	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	33	0	0	17	0	0	115	85	15	113	78	25
Stage 1	-	-	-	-	-	-	46	46	-	31	31	-
Stage 2	-	-	-	-	-	-	69	39	-	82	47	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1579	-	-	1600	-	-	862	805	1065	864	812	1051
Stage 1	-	-	-	-	-	-	968	857	-	986	869	-
Stage 2	-	-	-	-	-	-	941	862	-	926	856	-
Platoon blocked, %		-	-		-	-		-	-		-	-
Mov Cap-1 Maneuver	1579	-	-	1600	-	-	792	795	1065	798	802	1051
Mov Cap-2 Maneuver	-	-	-	-	-	-	792	795	-	798	802	-
Stage 1	-	-	-	-	-	-	958	848	-	976	867	-
Stage 2	-	-	-	-	-	-	859	860	-	841	847	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.5	0.6	9.9	9.8
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	812	1579	-	-	1600	-	-	828
HCM Lane V/C Ratio	0.09	0.01	-	-	0.002	-	-	0.093
HCM Control Delay (s)	9.9	7.3	0	-	7.3	0	-	9.8
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.3

Intersection

Int Delay, s/veh 1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↗	↖	
Traffic Vol, veh/h	20	0	4	22	1	3
Future Vol, veh/h	20	0	4	22	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	73	73	83	83	60	60
Heavy Vehicles, %	2	0	0	2	0	0
Mvmt Flow	27	0	5	27	2	5

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	27	0	63	27
Stage 1	-	-	-	-	27	-
Stage 2	-	-	-	-	36	-
Critical Hdwy	-	-	4.1	-	7.1	6.2
Critical Hdwy Stg 1	-	-	-	-	6.1	-
Critical Hdwy Stg 2	-	-	-	-	6.1	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1600	-	936	1054
Stage 1	-	-	-	-	996	-
Stage 2	-	-	-	-	985	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1600	-	934	1054
Mov Cap-2 Maneuver	-	-	-	-	934	-
Stage 1	-	-	-	-	996	-
Stage 2	-	-	-	-	982	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	8.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1021	-	-	1600	-
HCM Lane V/C Ratio	0.007	-	-	0.003	-
HCM Control Delay (s)	8.5	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection

Int Delay, s/veh 3.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	
Traffic Vol, veh/h	23	0	29	24	2	4
Future Vol, veh/h	23	0	29	24	2	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	68	68	95	95	60	60
Heavy Vehicles, %	2	0	0	2	0	0
Mvmt Flow	34	0	31	25	3	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	34	0	120	34
Stage 1	-	-	-	-	34	-
Stage 2	-	-	-	-	86	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1591	-	880	1045
Stage 1	-	-	-	-	994	-
Stage 2	-	-	-	-	942	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1591	-	862	1045
Mov Cap-2 Maneuver	-	-	-	-	862	-
Stage 1	-	-	-	-	994	-
Stage 2	-	-	-	-	923	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4	8.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	976	-	-	1591	-
HCM Lane V/C Ratio	0.01	-	-	0.019	-
HCM Control Delay (s)	8.7	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0.1	-

Intersection												
Int Delay, s/veh	3.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	2	15	9	0	16	16	1258	23	14	1036	37
Future Vol, veh/h	10	2	15	9	0	16	16	1258	23	14	1036	37
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	68	68	68	89	89	89	96	96	96	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	3	22	10	0	18	17	1310	24	15	1102	39

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1841	2520	571	1938	2527	667	1141	0	0	1334	0	0
Stage 1	1152	1152	-	1356	1356	-	-	-	-	-	-	-
Stage 2	689	1368	-	582	1171	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	47	28	464	39	27	401	608	-	-	513	-	-
Stage 1	210	270	-	157	216	-	-	-	-	-	-	-
Stage 2	402	213	-	466	265	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	39	23	464	29	22	401	608	-	-	513	-	-
Mov Cap-2 Maneuver	39	23	-	29	22	-	-	-	-	-	-	-
Stage 1	187	248	-	140	192	-	-	-	-	-	-	-
Stage 2	342	190	-	403	244	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	104.4	85.6	0.7	0.6
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	608	-	-	72	71	513	-	-
HCM Lane V/C Ratio	0.027	-	-	0.551	0.396	0.029	-	-
HCM Control Delay (s)	11.1	0.6	-	104.4	85.6	12.2	0.5	-
HCM Lane LOS	B	A	-	F	F	B	A	-
HCM 95th %tile Q(veh)	0.1	-	-	2.3	1.5	0.1	-	-

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↖	↖	↗
Traffic Vol, veh/h	0	12	0	1309	1028	7
Future Vol, veh/h	0	12	0	1309	1028	7
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	92	92	95	95	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	13	0	1378	1155	8

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	581	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	457	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	457	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	457	-	-
HCM Lane V/C Ratio	-	0.029	-	-
HCM Control Delay (s)	-	13.1	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %ile Q(veh)	-	0.1	-	-

HCM 2010 Signalized Intersection Summary
15: Coolidge & Harvard

07/28/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕↗		↗	↕↗	
Traffic Volume (veh/h)	51	11	16	21	10	28	30	1230	16	19	1006	15
Future Volume (veh/h)	51	11	16	21	10	28	30	1230	16	19	1006	15
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
Red-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	2080	2039	2080	2080	2039	2080	1961	1961	2000	1961	1961	2000
Adj Flow Rate, veh/h	65	14	21	31	15	41	31	1281	17	21	1130	17
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.78	0.78	0.78	0.68	0.68	0.68	0.96	0.96	0.96	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	412	94	115	236	130	272	254	1972	26	214	1968	30
Arrive On Green	0.34	0.34	0.34	0.34	0.34	0.34	0.52	0.52	0.52	0.52	0.52	0.52
Sat Flow, veh/h	1001	278	340	519	384	805	514	3765	50	445	3757	57
Grp Volume(v), veh/h	100	0	0	87	0	0	31	634	664	21	560	587
Grp Sat Flow(s), veh/h/ln	1619	0	0	1709	0	0	514	1863	1952	445	1863	1951
Q Serve(g_s), s	0.3	0.0	0.0	0.0	0.0	0.0	3.5	19.6	19.7	2.9	16.4	16.4
Cycle Q Clear(g_c), s	2.9	0.0	0.0	2.6	0.0	0.0	19.9	19.6	19.7	22.5	16.4	16.4
Prop In Lane	0.65		0.21	0.36		0.47	1.00		0.03	1.00		0.03
Lane Grp Cap(c), veh/h	621	0	0	638	0	0	254	976	1022	214	976	1022
V/C Ratio(X)	0.16	0.00	0.00	0.14	0.00	0.00	0.12	0.65	0.65	0.10	0.57	0.57
Avail Cap(c_a), veh/h	621	0	0	638	0	0	254	976	1022	214	976	1022
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	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	18.5	0.0	0.0	18.4	0.0	0.0	19.7	13.7	13.8	21.9	13.0	13.0
Incr Delay (d2), s/veh	0.6	0.0	0.0	0.4	0.0	0.0	1.0	3.3	3.2	0.9	2.5	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	1.6	0.0	0.0	1.4	0.0	0.0	0.6	10.9	11.4	0.4	9.1	9.5
LnGrp Delay(d),s/veh	19.1	0.0	0.0	18.9	0.0	0.0	20.7	17.1	17.0	22.8	15.4	15.3
LnGrp LOS	B			B			C	B	B	C	B	B
Approach Vol, veh/h		100			87			1329			1168	
Approach Delay, s/veh		19.1			18.9			17.1			15.5	
Approach LOS		B			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		47.0		33.0		47.0		33.0				
Change Period (Y+Rc), s		* 5.1		6.0		* 5.1		6.0				
Max Green Setting (Gmax), s		* 42		27.0		* 42		27.0				
Max Q Clear Time (g_c+I1), s		21.9		4.9		24.5		4.6				
Green Ext Time (p_c), s		16.1		1.1		14.3		1.1				
Intersection Summary												
HCM 2010 Ctrl Delay				16.5								
HCM 2010 LOS				B								
Notes												

Intersection

Int Delay, s/veh 1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	4	68	36	19	10	2
Future Vol, veh/h	4	68	36	19	10	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	78	78	83	83	60	60
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	87	43	23	17	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	66	0	-	0	152	55
Stage 1	-	-	-	-	55	-
Stage 2	-	-	-	-	97	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1536	-	-	-	840	1012
Stage 1	-	-	-	-	968	-
Stage 2	-	-	-	-	927	-
Platoon blocked, %						
Mov Cap-1 Maneuver	1536	-	-	-	837	1012
Mov Cap-2 Maneuver	-	-	-	-	837	-
Stage 1	-	-	-	-	968	-
Stage 2	-	-	-	-	924	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1536	-	-	-	862
HCM Lane V/C Ratio	0.003	-	-	-	0.023
HCM Control Delay (s)	7.4	0	-	-	9.3
HCM Lane LOS	A	A	-	-	A
HCM 95th %ile Q(veh)	0	-	-	-	0.1

Intersection												
Int Delay, s/veh	7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	22	0	9	18	4	2	43	18	7	28	5
Future Vol, veh/h	1	22	0	9	18	4	2	43	18	7	28	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	64	64	64	71	71	71	60	60	60
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	28	0	14	28	6	3	61	25	12	47	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	34	0	0	28	0	0	117	93	28	132	89	31
Stage 1	-	-	-	-	-	-	30	30	-	59	59	-
Stage 2	-	-	-	-	-	-	87	63	-	73	30	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1578	-	-	1585	-	-	859	797	1047	840	801	1043
Stage 1	-	-	-	-	-	-	987	870	-	953	846	-
Stage 2	-	-	-	-	-	-	921	842	-	937	870	-
Platoon blocked, %		-	-		-	-		-	-		-	-
Mov Cap-1 Maneuver	1578	-	-	1585	-	-	808	789	1047	766	793	1043
Mov Cap-2 Maneuver	-	-	-	-	-	-	808	789	-	766	793	-
Stage 1	-	-	-	-	-	-	986	869	-	952	838	-
Stage 2	-	-	-	-	-	-	855	834	-	850	869	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	2.1	9.7	9.8
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	849	1578	-	-	1585	-	-	812
HCM Lane V/C Ratio	0.105	0.001	-	-	0.009	-	-	0.082
HCM Control Delay (s)	9.7	7.3	0	-	7.3	0	-	9.8
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.3