

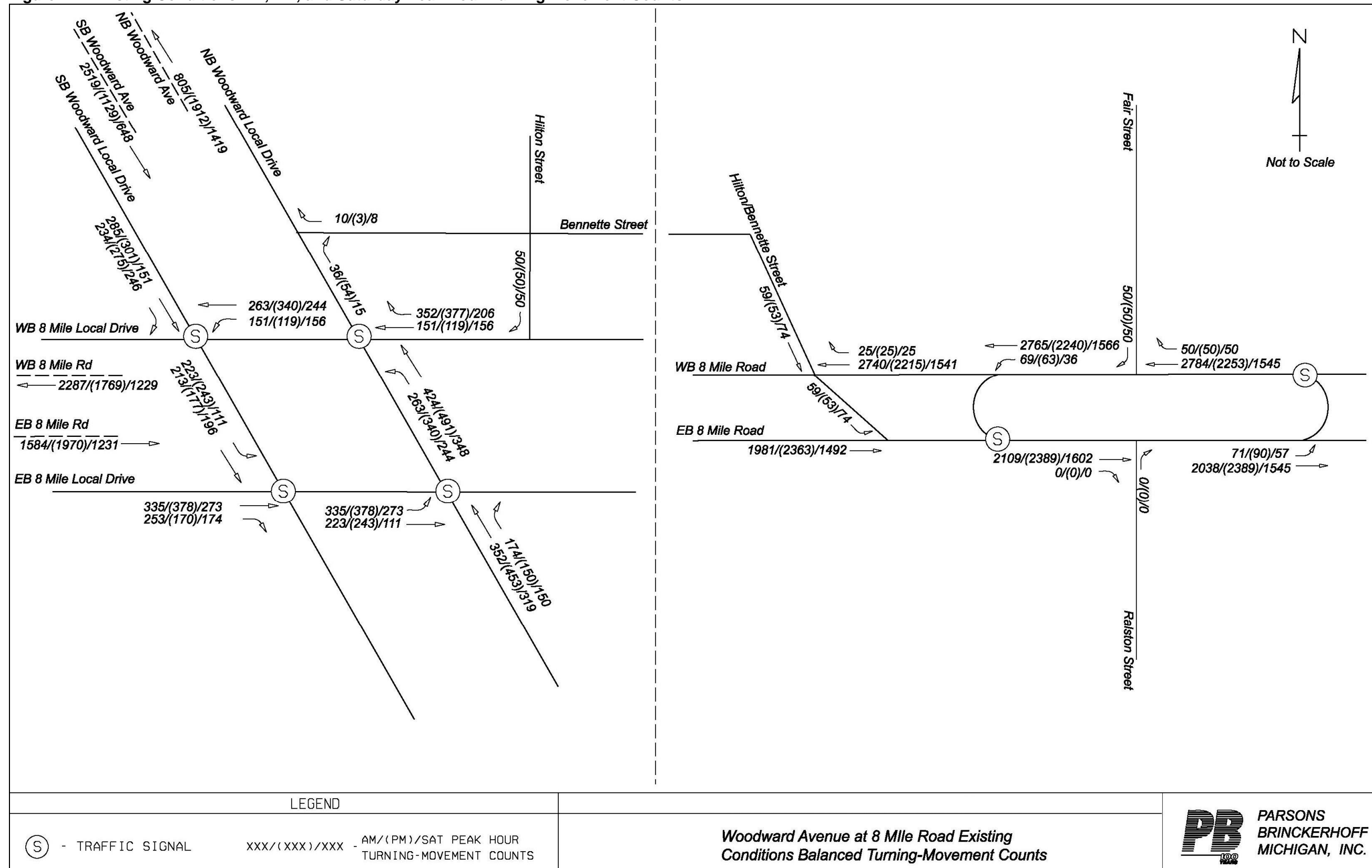
APPENDICES

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APPENDIX – A

Turning Movement Counts

Figure 2-1: Existing Conditions AM, PM, and Saturday Peak Hour Turning-Movement Counts



2007 Turning Movement Counts

Woodward (M-1) at Eight Mile (M-102)	Northbound				Southbound				Westbound				Eastbound			
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total
AM Peak (8:00 - 9:00)	263	89	174	526	223	62	234	519	151	0	352	503	335	0	253	588
PM Peak (5:00 - 6:00)	340	113	176	629	243	58	275	576	119	0	377	496	378	0	170	548
Saturday (1:00 - 2:00)	244	75	150	470	111	40	246	397	156	0	206	362	273	0	174	447

Counts based on 24-hour Approach Counts and Percent of turning vehicles taken from turning-movement counts

Woodward NB (M-1) at Bennet St	Northbound		Westbound
	Thru	Right	Right
AM Peak (8:00 - 9:00)	740	36	10
PM Peak (5:00 - 6:00)	814	54	3
Saturday (1:00 - 2:00)	539	15	8

8 Mile at WB to EB x- over	Eastbound	Southbound
	Thru	Left
AM Peak (8:00 - 9:00)	2040	69
PM Peak (5:00 - 6:00)	2416	63
Saturday (1:00 - 2:00)	1566	36

Factored PM and Saturday counts

8 Mile at EB to WB x- over	Westbound	Northbound
	Thru	Left
AM Peak (8:00 - 9:00)	2763	71
PM Peak (5:00 - 6:00)	2213	90
Saturday (1:00 - 2:00)	1545	57

8 Mile at Bennet St	Westbound		Southbound
	Thru	Right	Thru
AM Peak (8:00 - 9:00)	2740	25	59
PM Peak (5:00 - 6:00)	2215	25	53
Saturday (1:00 - 2:00)	1541	25	74

Southbound Counts taken from 2003 and factored up to 2007 using a growth rate of 1% per year

8 Mile at Hilton Ave	Westbound	Southbound
	Thru	Right
AM Peak (8:00 - 9:00)	453	50
PM Peak (5:00 - 6:00)	446	50
Saturday (1:00 - 2:00)	312	50

Turning traffic was estimated

2007 Turning Movement Counts

8 Mile at Fair St	Westbound		Southbound
	Thru	Right	Right
AM Peak (8:00 - 9:00)	2784	50	50
PM Peak (5:00 - 6:00)	2253	50	50
Saturday (1:00 - 2:00)	1552	50	50

Turning traffic was estimated

8 Mile at Ralston	Eastbound		Northbound
	Thru	Right	Right
AM Peak (8:00 - 9:00)	2109	0*	0*
PM Peak (5:00 - 6:00)	2479	0*	0*
Saturday (1:00 - 2:00)	1602	0*	0*

*The street is currently fenced off

Woodward at Fair	Westbound		Northbound		Southbound
	Left	Right	Thru	Right	Thru
AM Peak (8:00 - 9:00)	5	10	1321	24	2985
PM Peak (5:00 - 6:00)	5	10	2505	10	1476
Saturday (1:00 - 2:00)	5	10	1878	10	1018

Intersection counts taken from counts from 2003 and factored up to 2007 using a growth rate of 1% per year
 Saturday counts derived from PM counts based on PM and Saturday counts at Woodward and 8 Mile Service Drive



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Count Name: 82131-01-044
 _Sept 26_2019 Counts
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Turning Movement Data

Start Time	M1 (Woodward) Southbound					State Fair Ave Westbound					M1 (Woodward) Northbound					Int. Total
	Thru	Left	U-Turn	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	Right	Thru	U-Turn	Peds	App. Total	
12:00 AM	41	0	1	3	42	6	6	0	5	12	4	35	0	0	39	93
12:15 AM	24	1	1	0	26	6	3	0	1	9	7	29	0	0	36	71
12:30 AM	29	0	2	0	31	7	4	0	1	11	5	22	1	0	28	70
12:45 AM	28	0	3	1	31	0	5	0	0	5	1	18	0	0	19	55
Hourly Total	122	1	7	4	130	19	18	0	7	37	17	104	1	0	122	289
1:00 AM	25	0	3	0	28	2	2	1	3	5	7	27	0	0	34	67
1:15 AM	26	0	2	0	28	4	1	0	1	5	2	17	0	0	19	52
1:30 AM	16	1	3	0	20	0	2	0	0	2	4	17	0	0	21	43
1:45 AM	18	0	1	0	19	0	3	0	6	3	2	14	0	0	16	38
Hourly Total	85	1	9	0	95	6	8	1	10	15	15	75	0	0	90	200
2:00 AM	12	0	0	0	12	1	6	0	0	7	3	11	0	0	14	33
2:15 AM	13	0	1	0	14	1	1	0	2	2	4	8	0	0	12	28
2:30 AM	7	0	2	0	9	1	4	0	1	5	4	7	0	0	11	25
2:45 AM	17	0	0	0	17	2	3	0	4	5	3	9	0	2	12	34
Hourly Total	49	0	3	0	52	5	14	0	7	19	14	35	0	2	49	120
3:00 AM	7	0	1	0	8	1	2	0	0	3	0	12	0	0	12	23
3:15 AM	8	0	0	0	8	1	1	0	0	2	1	5	0	0	6	16
3:30 AM	7	0	1	0	8	2	1	0	3	3	1	15	0	0	16	27
3:45 AM	10	2	1	0	13	1	1	0	8	2	0	10	0	0	10	25
Hourly Total	32	2	3	0	37	5	5	0	11	10	2	42	0	0	44	91
4:00 AM	12	0	0	0	12	1	2	0	4	3	1	14	0	0	15	30
4:15 AM	14	0	0	0	14	6	2	0	2	8	2	13	0	0	15	37
4:30 AM	18	0	1	0	19	4	0	0	5	4	2	9	0	0	11	34
4:45 AM	27	1	3	0	31	2	1	0	6	3	1	17	0	0	18	52
Hourly Total	71	1	4	0	76	13	5	0	17	18	6	53	0	0	59	153
5:00 AM	21	1	1	1	23	4	2	0	3	6	1	13	0	0	14	43
5:15 AM	40	0	2	0	42	7	5	0	7	12	2	28	0	0	30	84
5:30 AM	53	0	2	0	55	5	3	0	3	8	3	32	0	0	35	98
5:45 AM	57	4	5	3	66	3	3	0	5	6	0	39	0	0	39	111
Hourly Total	171	5	10	4	186	19	13	0	18	32	6	112	0	0	118	336
6:00 AM	106	2	3	0	111	11	6	0	4	17	5	49	0	0	54	182
6:15 AM	142	0	3	0	145	14	8	0	6	22	3	56	0	0	59	226
6:30 AM	219	2	3	2	224	12	1	0	2	13	2	73	0	0	75	312
6:45 AM	302	0	2	0	304	22	8	0	2	30	7	93	0	2	100	434
Hourly Total	769	4	11	2	784	59	23	0	14	82	17	271	0	2	288	1154
7:00 AM	452	1	4	0	457	16	8	0	10	24	8	128	0	3	136	617
7:15 AM	636	1	4	0	641	33	13	0	9	46	9	176	0	2	185	872
7:30 AM	872	2	8	1	882	33	16	1	9	50	9	212	0	2	221	1153
7:45 AM	940	1	3	0	944	43	21	0	2	64	10	208	0	0	218	1226
Hourly Total	2900	5	19	1	2924	125	58	1	30	184	36	724	0	7	760	3868
8:00 AM	911	1	4	2	916	37	19	0	5	56	12	204	0	3	216	1188
8:15 AM	960	1	3	2	964	39	21	0	7	60	17	226	0	0	243	1267
8:30 AM	892	1	5	0	898	35	15	0	5	50	19	173	0	2	192	1140
8:45 AM	684	0	5	0	689	28	16	0	9	44	11	174	0	1	185	918
Hourly Total	3447	3	17	4	3467	139	71	0	26	210	59	777	0	6	836	4513
9:00 AM	456	2	3	1	461	15	16	0	7	31	7	156	0	4	163	655
9:15 AM	344	1	7	0	352	24	11	0	8	35	11	140	0	1	151	538
9:30 AM	336	1	3	2	340	25	12	0	5	37	9	139	0	1	148	525
9:45 AM	269	1	5	2	275	25	13	0	7	38	18	157	0	1	175	488
Hourly Total	1405	5	18	5	1428	89	52	0	27	141	45	592	0	7	637	2206
10:00 AM	247	2	9	3	258	26	12	0	6	38	14	156	0	0	170	466
10:15 AM	256	0	10	3	266	18	18	0	6	36	35	160	0	2	195	497
10:30 AM	249	1	7	1	257	14	10	0	6	24	8	165	0	3	173	454
10:45 AM	228	1	7	3	236	21	13	0	16	34	10	169	0	4	179	449
Hourly Total	980	4	33	10	1017	79	53	0	34	132	67	650	0	9	717	1866
11:00 AM	246	1	4	1	251	21	13	0	10	34	13	181	0	1	194	479
11:15 AM	241	0	6	1	247	12	13	0	5	25	13	199	0	1	212	484

11:30 AM	240	2	9	1	251	30	14	0	4	44	11	207	0	0	218	513
11:45 AM	266	1	4	0	271	32	14	0	6	46	14	220	0	0	234	551
Hourly Total	993	4	23	3	1020	95	54	0	25	149	51	807	0	2	858	2027
12:00 PM	264	1	6	0	271	18	17	0	5	35	11	199	0	0	210	516
12:15 PM	266	1	5	0	272	24	17	0	23	41	3	250	0	2	253	566
12:30 PM	276	2	5	2	283	27	23	0	12	50	18	209	0	3	227	560
12:45 PM	283	1	5	0	289	19	14	0	9	33	13	221	0	3	234	556
Hourly Total	1089	5	21	2	1115	88	71	0	49	159	45	879	0	8	924	2198
1:00 PM	263	2	11	1	276	23	8	0	10	31	9	206	0	1	215	522
1:15 PM	263	1	27	1	291	14	18	0	11	32	10	241	0	0	251	574
1:30 PM	276	2	11	0	289	19	14	0	10	33	6	216	0	0	222	544
1:45 PM	230	1	5	5	236	22	15	0	11	37	11	221	0	2	232	505
Hourly Total	1032	6	54	7	1092	78	55	0	42	133	36	884	0	3	920	2145
2:00 PM	213	1	5	2	219	32	24	0	16	56	15	267	0	0	282	557
2:15 PM	248	1	5	0	254	36	23	0	7	59	11	299	0	3	310	623
2:30 PM	226	1	5	0	232	50	24	0	4	74	20	337	0	0	357	663
2:45 PM	278	1	8	3	287	25	19	0	10	44	25	405	0	2	430	761
Hourly Total	965	4	23	5	992	143	90	0	37	233	71	1308	0	5	1379	2604
3:00 PM	268	1	8	2	277	35	12	0	5	47	17	370	0	0	387	711
3:15 PM	261	2	2	4	265	31	19	0	18	50	24	454	0	3	478	793
3:30 PM	233	1	5	1	239	49	19	0	9	68	15	490	1	3	506	813
3:45 PM	268	2	4	5	274	40	21	0	9	61	11	507	0	3	518	853
Hourly Total	1030	6	19	12	1055	155	71	0	41	226	67	1821	1	9	1889	3170
4:00 PM	316	0	3	0	319	41	21	0	7	62	22	632	0	3	654	1035
4:15 PM	364	1	10	6	375	44	23	1	6	68	29	698	0	3	727	1170
4:30 PM	312	1	7	7	320	50	24	0	2	74	23	723	0	2	746	1140
4:45 PM	348	2	7	1	357	40	16	0	3	56	28	788	0	1	816	1229
Hourly Total	1340	4	27	14	1371	175	84	1	18	260	102	2841	0	9	2943	4574
5:00 PM	365	2	10	2	377	41	21	0	7	62	19	787	0	1	806	1245
5:15 PM	393	1	9	1	403	33	21	0	5	54	26	888	0	0	914	1371
5:30 PM	355	4	5	3	364	36	21	0	4	57	16	893	0	5	909	1330
5:45 PM	377	1	3	2	381	50	14	0	3	64	18	847	0	0	865	1310
Hourly Total	1490	8	27	8	1525	160	77	0	19	237	79	3415	0	6	3494	5256
6:00 PM	365	0	6	1	371	34	24	0	7	58	18	624	0	0	642	1071
6:15 PM	325	2	5	0	332	36	22	0	10	58	19	474	0	2	493	883
6:30 PM	325	1	6	2	332	38	15	0	8	53	15	430	0	0	445	830
6:45 PM	266	1	8	0	275	26	20	0	10	46	16	335	0	1	351	672
Hourly Total	1281	4	25	3	1310	134	81	0	35	215	68	1863	0	3	1931	3456
7:00 PM	221	1	4	0	226	19	18	0	4	37	15	270	0	1	285	548
7:15 PM	217	2	2	1	221	19	17	0	8	36	12	244	0	2	256	513
7:30 PM	211	0	5	1	216	26	17	0	8	43	14	260	0	0	274	533
7:45 PM	199	3	4	0	206	21	17	0	6	38	12	213	0	1	225	469
Hourly Total	848	6	15	2	869	85	69	0	26	154	53	987	0	4	1040	2063
8:00 PM	195	1	5	5	201	23	11	0	11	34	10	216	0	3	226	461
8:15 PM	185	0	5	2	190	18	12	0	8	30	15	170	0	0	185	405
8:30 PM	156	2	4	1	162	17	11	0	7	28	9	155	0	2	164	354
8:45 PM	151	1	4	0	156	17	10	0	9	27	8	188	0	0	196	379
Hourly Total	687	4	18	8	709	75	44	0	35	119	42	729	0	5	771	1599
9:00 PM	175	0	1	0	176	9	14	0	6	23	17	154	1	0	172	371
9:15 PM	119	1	3	0	123	14	12	0	5	26	11	112	0	2	123	272
9:30 PM	125	1	3	0	129	15	6	0	6	21	5	127	0	0	132	282
9:45 PM	106	1	2	0	109	13	8	0	3	21	9	107	0	1	116	246
Hourly Total	525	3	9	0	537	51	40	0	20	91	42	500	1	3	543	1171
10:00 PM	113	1	2	0	116	6	7	0	3	13	7	96	0	0	103	232
10:15 PM	104	0	5	0	109	8	9	0	0	17	15	75	0	0	90	216
10:30 PM	85	0	2	0	87	9	6	0	4	15	7	93	0	1	100	202
10:45 PM	97	1	1	0	99	14	8	0	2	22	8	81	0	0	89	210
Hourly Total	399	2	10	0	411	37	30	0	9	67	37	345	0	1	382	860
11:00 PM	75	0	5	1	80	7	5	0	6	12	7	52	0	0	59	151
11:15 PM	73	0	2	0	75	7	13	0	3	20	10	47	0	0	57	152
11:30 PM	63	0	1	0	64	4	2	0	6	6	10	44	0	0	54	124
11:45 PM	59	0	2	0	61	8	7	0	2	15	5	41	0	0	46	122
Hourly Total	270	0	10	1	280	26	27	0	17	53	32	184	0	0	216	549
Grand Total	21980	87	415	95	22482	1860	1113	3	574	2976	1009	19998	3	91	21010	46468
Approach %	97.8	0.4	1.8	-	-	62.5	37.4	0.1	-	-	4.8	95.2	0.0	-	-	-
Total %	47.3	0.2	0.9	-	48.4	4.0	2.4	0.0	-	6.4	2.2	43.0	0.0	-	45.2	-
Lights	21479	16	184	-	21679	1734	1098	3	-	2835	966	19553	3	-	20522	45036
% Lights	97.7	18.4	44.3	-	96.4	93.2	98.7	100.0	-	95.3	95.7	97.8	100.0	-	97.7	96.9
Buses	216	69	229	-	514	98	2	0	-	100	3	221	0	-	224	838
% Buses	1.0	79.3	55.2	-	2.3	5.3	0.2	0.0	-	3.4	0.3	1.1	0.0	-	1.1	1.8
Single-Unit Trucks	168	1	2	-	171	18	11	0	-	29	14	159	0	-	173	373
% Single-Unit Trucks	0.8	1.1	0.5	-	0.8	1.0	1.0	0.0	-	1.0	1.4	0.8	0.0	-	0.8	0.8
Articulated Trucks	80	0	0	-	80	5	2	0	-	7	1	50	0	-	51	138
% Articulated Trucks	0.4	0.0	0.0	-	0.4	0.3	0.2	0.0	-	0.2	0.1	0.3	0.0	-	0.2	0.3
Bicycles on Road	37	1	0	-	38	5	0	0	-	5	25	15	0	-	40	83

% Bicycles on Road	0.2	1.1	0.0	-	0.2	0.3	0.0	0.0	-	0.2	2.5	0.1	0.0	-	0.2	0.2
Bicycles on Crosswalk	-	-	-	7	-	-	-	-	58	-	-	-	-	10	-	-
% Bicycles on Crosswalk	-	-	-	7.4	-	-	-	-	10.1	-	-	-	-	11.0	-	-
Pedestrians	-	-	-	88	-	-	-	-	516	-	-	-	-	81	-	-
% Pedestrians	-	-	-	92.6	-	-	-	-	89.9	-	-	-	-	89.0	-	-

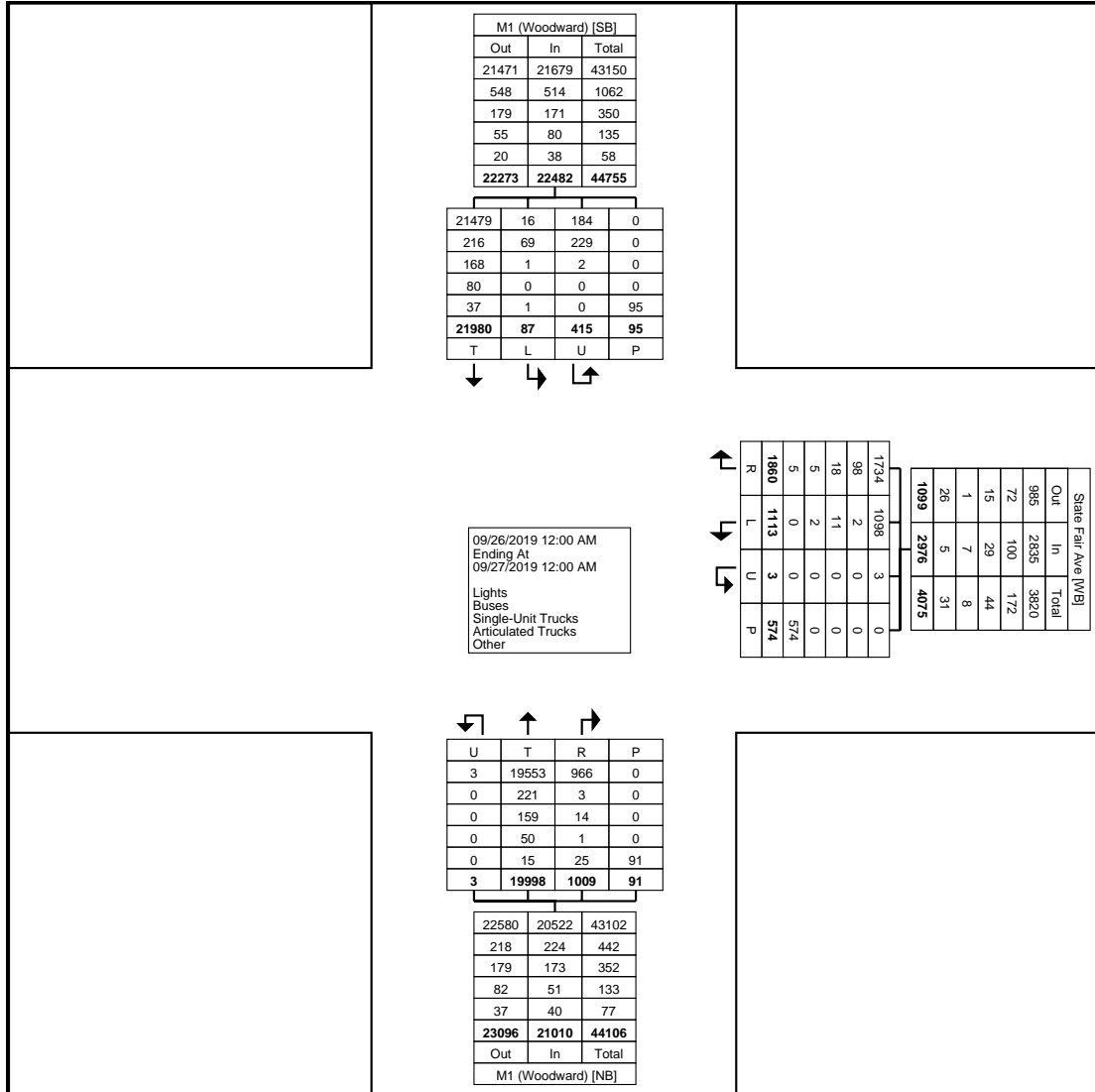


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Count Name: 82131-01-044
 _Sept 26_2019 Counts
 Site Code: 82131-01-044
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 Start Date: 09/26/2019
 Page No: 4



Turning Movement Data Plot



Project: MDOT Metro
 Region Traffic Counts
 Corridor: M-1 (Woodward
 Ave.)
 Weather: Sunny, Dry Temp.
 70's
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Turning Movement Peak Hour Data (7:30 AM)

Start Time	M1 (Woodward) Southbound					State Fair Ave Westbound					M1 (Woodward) Northbound					Int. Total
	Thru	Left	U-Turn	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	Right	Thru	U-Turn	Peds	App. Total	
7:30 AM	872	2	8	1	882	33	16	1	9	50	9	212	0	2	221	1153
7:45 AM	940	1	3	0	944	43	21	0	2	64	10	208	0	0	218	1226
8:00 AM	911	1	4	2	916	37	19	0	5	56	12	204	0	3	216	1188
8:15 AM	960	1	3	2	964	39	21	0	7	60	17	226	0	0	243	1267
Total	3683	5	18	5	3706	152	77	1	23	230	48	850	0	5	898	4834
Approach %	99.4	0.1	0.5	-	-	66.1	33.5	0.4	-	-	5.3	94.7	0.0	-	-	-
Total %	76.2	0.1	0.4	-	76.7	3.1	1.6	0.0	-	4.8	1.0	17.6	0.0	-	18.6	-
PHF	0.959	0.625	0.563	-	0.961	0.884	0.917	0.250	-	0.898	0.706	0.940	0.000	-	0.924	0.954
Lights	3644	0	8	-	3652	146	77	1	-	224	48	820	0	-	868	4744
% Lights	98.9	0.0	44.4	-	98.5	96.1	100.0	100.0	-	97.4	100.0	96.5	-	-	96.7	98.1
Buses	14	5	10	-	29	6	0	0	-	6	0	16	0	-	16	51
% Buses	0.4	100.0	55.6	-	0.8	3.9	0.0	0.0	-	2.6	0.0	1.9	-	-	1.8	1.1
Single-Unit Trucks	18	0	0	-	18	0	0	0	-	0	0	11	0	-	11	29
% Single-Unit Trucks	0.5	0.0	0.0	-	0.5	0.0	0.0	0.0	-	0.0	0.0	1.3	-	-	1.2	0.6
Articulated Trucks	7	0	0	-	7	0	0	0	-	0	0	3	0	-	3	10
% Articulated Trucks	0.2	0.0	0.0	-	0.2	0.0	0.0	0.0	-	0.0	0.0	0.4	-	-	0.3	0.2
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	20.0	-	-
Pedestrians	-	-	-	5	-	-	-	-	23	-	-	-	-	4	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	80.0	-	-

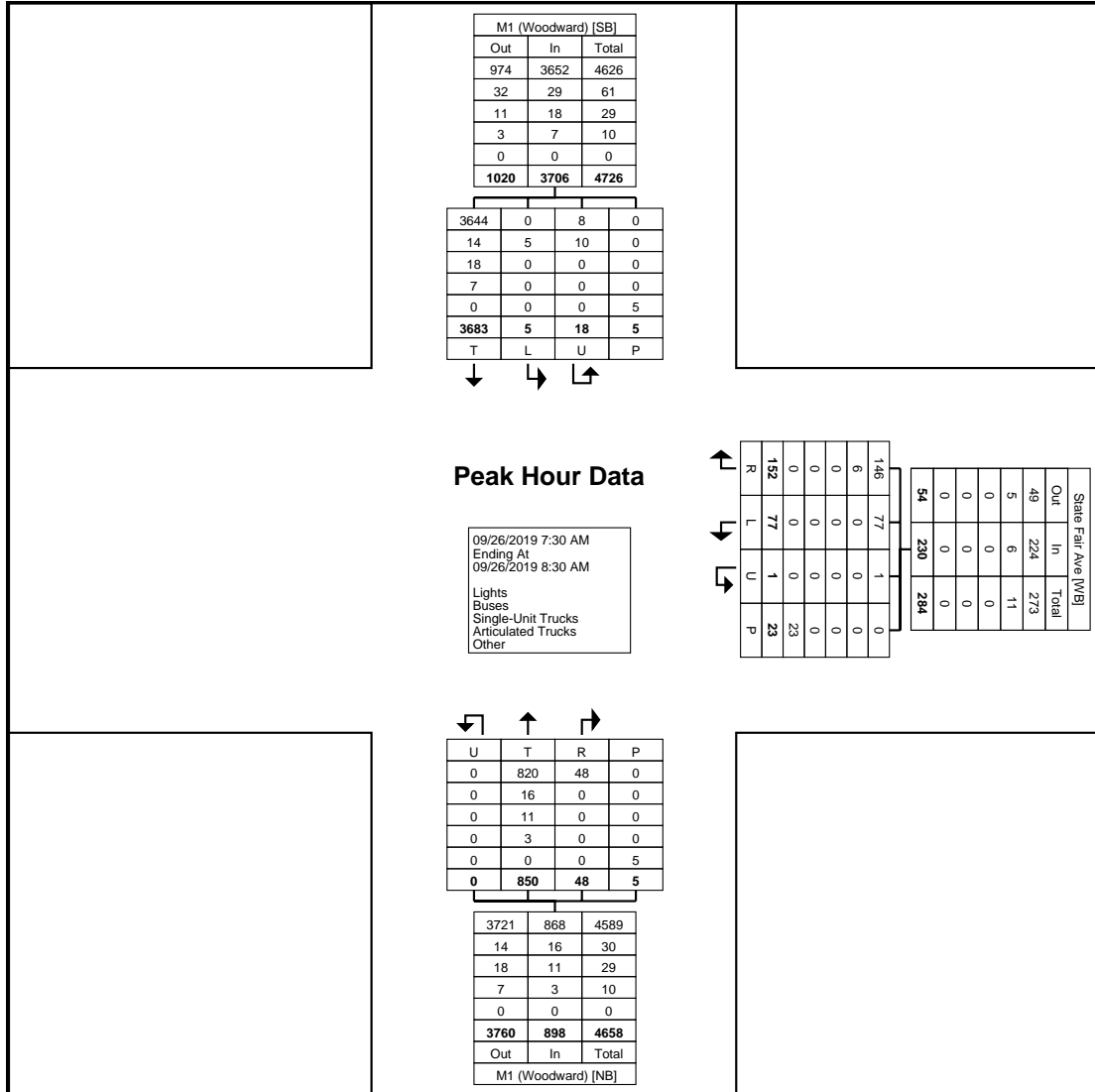


Traffic Data Collection

Traffic Data Collection, LLC
7504 Sawgrass Drive
www.tdccounts.com
Washington, Michigan, United States 48094
Ph. (586) 786-5407
Reliable Traffic Data

Project: MDOT Metro
Region Traffic Counts
Corridor: M-1 (Woodward
Ave.)
Weather: Sunny, Dry Temp.
70's
Video VCU ID#: SCU3DQ,
SW & SCU1US, SE

Count Name: 82131-01-044
_Sept 26_2019 Counts
Site Code: 82131-01-044
Traffic Data Collection,
LLC
Start Date: 09/26/2019
Page No: 6



Turning Movement Peak Hour Data Plot (7:30 AM)



Traffic Data Collection

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 7504 Sawgrass Drive
 www.tdccounts.com
 Washington, Michigan, United States 48094
 Ph. (586) 786-5407
 Reliable Traffic Data

Project: MDOT Metro
 Region Traffic Counts
 Corridor: M-1 (Woodward
 Ave.)
 Weather: Sunny, Dry Temp.
 70's
 Video VCU ID#: SCU3DQ,
 SW & SCU1US, SE

Count Name: 82131-01-044
 _Sept 26_2019 Counts
 Site Code: 82131-01-044
 Traffic Data Collection,
 LLC
 Start Date: 09/26/2019
 Page No: 7

Turning Movement Peak Hour Data (12:00 PM)

Start Time	M1 (Woodward) Southbound					State Fair Ave Westbound					M1 (Woodward) Northbound					Int. Total
	Thru	Left	U-Turn	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	Right	Thru	U-Turn	Peds	App. Total	
12:00 PM	264	1	6	0	271	18	17	0	5	35	11	199	0	0	210	516
12:15 PM	266	1	5	0	272	24	17	0	23	41	3	250	0	2	253	566
12:30 PM	276	2	5	2	283	27	23	0	12	50	18	209	0	3	227	560
12:45 PM	283	1	5	0	289	19	14	0	9	33	13	221	0	3	234	556
Total	1089	5	21	2	1115	88	71	0	49	159	45	879	0	8	924	2198
Approach %	97.7	0.4	1.9	-	-	55.3	44.7	0.0	-	-	4.9	95.1	0.0	-	-	-
Total %	49.5	0.2	1.0	-	50.7	4.0	3.2	0.0	-	7.2	2.0	40.0	0.0	-	42.0	-
PHF	0.962	0.625	0.875	-	0.965	0.815	0.772	0.000	-	0.795	0.625	0.879	0.000	-	0.913	0.971
Lights	1050	1	8	-	1059	81	70	0	-	151	42	857	0	-	899	2109
% Lights	96.4	20.0	38.1	-	95.0	92.0	98.6	-	-	95.0	93.3	97.5	-	-	97.3	96.0
Buses	12	4	13	-	29	5	0	0	-	5	0	9	0	-	9	43
% Buses	1.1	80.0	61.9	-	2.6	5.7	0.0	-	-	3.1	0.0	1.0	-	-	1.0	2.0
Single-Unit Trucks	17	0	0	-	17	1	1	0	-	2	3	12	0	-	15	34
% Single-Unit Trucks	1.6	0.0	0.0	-	1.5	1.1	1.4	-	-	1.3	6.7	1.4	-	-	1.6	1.5
Articulated Trucks	10	0	0	-	10	0	0	0	-	0	0	0	0	-	0	10
% Articulated Trucks	0.9	0.0	0.0	-	0.9	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.5
Bicycles on Road	0	0	0	-	0	1	0	0	-	1	0	1	0	-	1	2
% Bicycles on Road	0.0	0.0	0.0	-	0.0	1.1	0.0	-	-	0.6	0.0	0.1	-	-	0.1	0.1
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	6	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	12.2	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	2	-	-	-	-	43	-	-	-	-	8	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	87.8	-	-	-	-	100.0	-	-



Traffic Data Collection

Traffic Data Collection, LLC

7504 Sawgrass Drive

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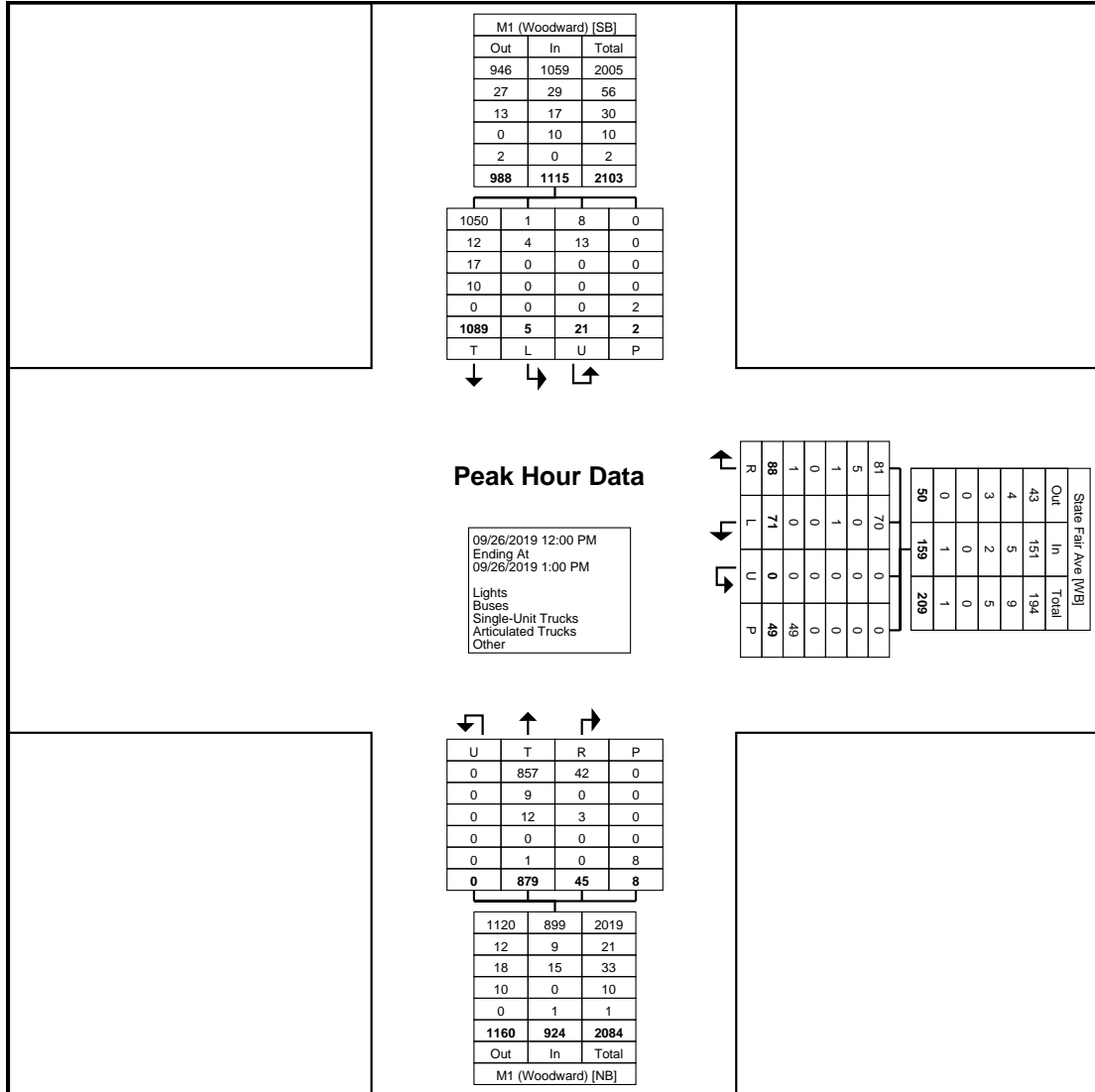
Washington, Michigan, United States 48094

Ph. (586) 786-5407

Reliable Traffic Data

Project: MDOT Metro
 Region Traffic Counts
 Corridor: M-1 (Woodward
 Ave.)
 Weather: Sunny, Dry Temp.
 70's
 Video VCU ID#: SCU3DQ,
 SW & SCU1US, SE

Count Name: 82131-01-044
 _Sept 26_2019 Counts
 Site Code: 82131-01-044
 Traffic Data Collection,
 LLC
 Start Date: 09/26/2019
 Page No: 8



Turning Movement Peak Hour Data Plot (12:00 PM)



Traffic Data Collection

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Count Name: 82131-01-044
 _Sept 26_2019 Counts
 Site Code: 82131-01-044
 Traffic Data Collection,
 LLC
 Start Date: 09/26/2019
 Page No: 9

Turning Movement Peak Hour Data (5:00 PM)

Start Time	M1 (Woodward) Southbound					State Fair Ave Westbound					M1 (Woodward) Northbound					Int. Total
	Thru	Left	U-Turn	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	Right	Thru	U-Turn	Peds	App. Total	
5:00 PM	365	2	10	2	377	41	21	0	7	62	19	787	0	1	806	1245
5:15 PM	393	1	9	1	403	33	21	0	5	54	26	888	0	0	914	1371
5:30 PM	355	4	5	3	364	36	21	0	4	57	16	893	0	5	909	1330
5:45 PM	377	1	3	2	381	50	14	0	3	64	18	847	0	0	865	1310
Total	1490	8	27	8	1525	160	77	0	19	237	79	3415	0	6	3494	5256
Approach %	97.7	0.5	1.8	-	-	67.5	32.5	0.0	-	-	2.3	97.7	0.0	-	-	-
Total %	28.3	0.2	0.5	-	29.0	3.0	1.5	0.0	-	4.5	1.5	65.0	0.0	-	66.5	-
PHF	0.948	0.500	0.675	-	0.946	0.800	0.917	0.000	-	0.926	0.760	0.956	0.000	-	0.956	0.958
Lights	1466	3	15	-	1484	152	76	0	-	228	79	3377	0	-	3456	5168
% Lights	98.4	37.5	55.6	-	97.3	95.0	98.7	-	-	96.2	100.0	98.9	-	-	98.9	98.3
Buses	13	4	12	-	29	5	0	0	-	5	0	22	0	-	22	56
% Buses	0.9	50.0	44.4	-	1.9	3.1	0.0	-	-	2.1	0.0	0.6	-	-	0.6	1.1
Single-Unit Trucks	7	0	0	-	7	3	1	0	-	4	0	13	0	-	13	24
% Single-Unit Trucks	0.5	0.0	0.0	-	0.5	1.9	1.3	-	-	1.7	0.0	0.4	-	-	0.4	0.5
Articulated Trucks	3	0	0	-	3	0	0	0	-	0	0	2	0	-	2	5
% Articulated Trucks	0.2	0.0	0.0	-	0.2	0.0	0.0	-	-	0.0	0.0	0.1	-	-	0.1	0.1
Bicycles on Road	1	1	0	-	2	0	0	0	-	0	0	1	0	-	1	3
% Bicycles on Road	0.1	12.5	0.0	-	0.1	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	2	-	-	-	-	1	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	25.0	-	-	-	-	5.3	-	-	-	-	16.7	-	-
Pedestrians	-	-	-	6	-	-	-	-	18	-	-	-	-	5	-	-
% Pedestrians	-	-	-	75.0	-	-	-	-	94.7	-	-	-	-	83.3	-	-



Traffic Data Collection

Traffic Data Collection, LLC

7504 Sawgrass Drive

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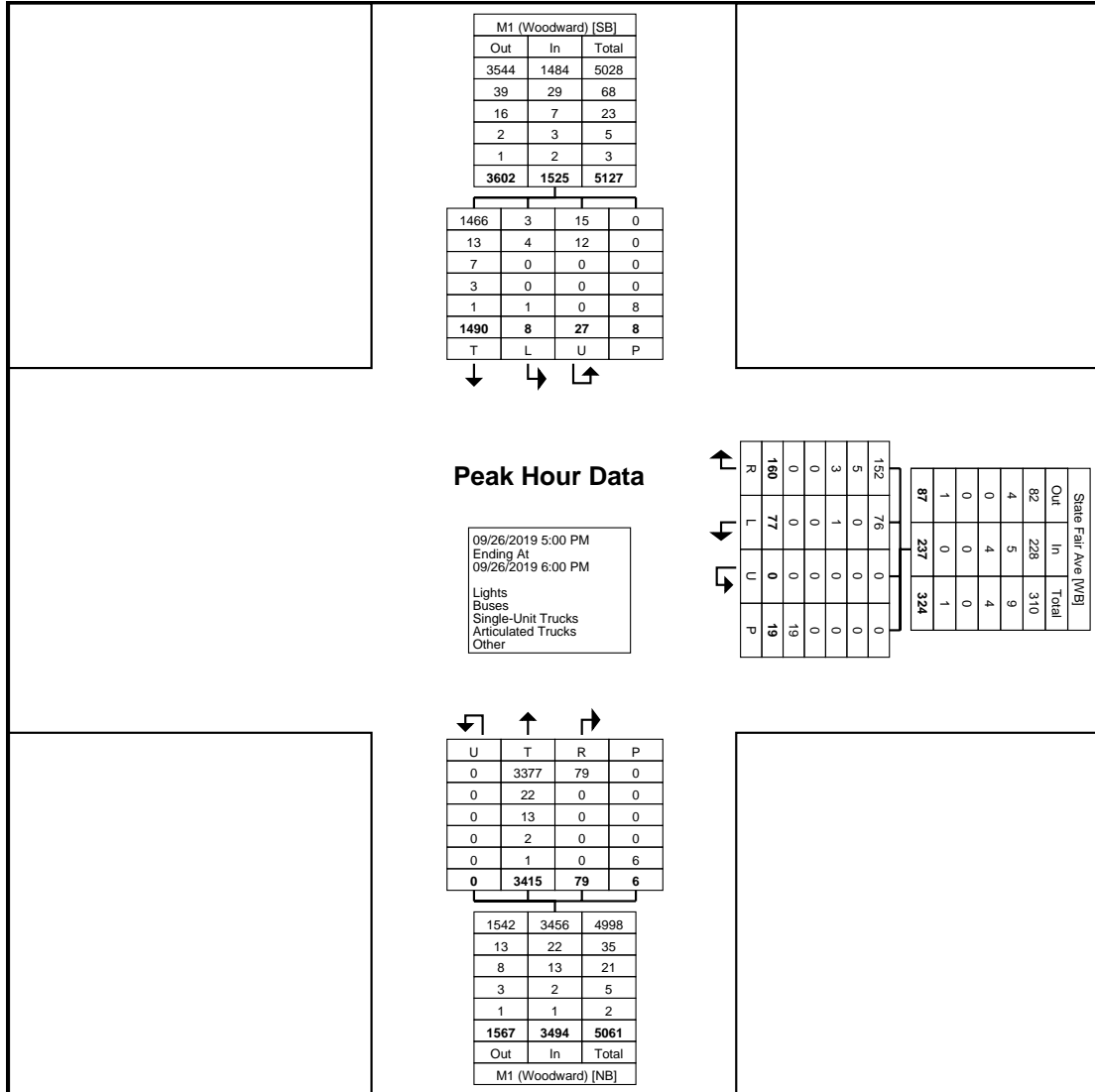
Washington, Michigan, United States 48094

Ph. (586) 786-5407

Reliable Traffic Data

Project: MDOT Metro
 Region Traffic Counts
 Corridor: M-1 (Woodward
 Ave.)
 Weather: Sunny, Dry Temp.
 70's
 Video VCU ID#: SCU3DQ,
 SW & SCU1US, SE

Count Name: 82131-01-044
 _Sept 26_2019 Counts
 Site Code: 82131-01-044
 Traffic Data Collection,
 LLC
 Start Date: 09/26/2019
 Page No: 10



Turning Movement Peak Hour Data Plot (5:00 PM)



Project: MDOT Metro
Region Traffic Counts
Corridor: M-1 (Woodward
Ave.)
Weather: Sunny, Dry Temp.
70's
Video VCU ID#: SCU3DQ,
SW & SCU1US, SE

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Washington, Michigan, United States 48094
Ph. (586) 786-5407
Reliable Traffic Data

Count Name: 82131-01-044
_Sept 26_2019 Counts
Site Code: 82131-01-044
Traffic Data Collection,
LLC
Start Date: 09/26/2019
Page No: 11

TDC Traffic Comments: 24 hour multi-modal intersection study includes video premium vehicle classification turning movement count & automatic traffic recorder approach counts conducted during typical weekdays (Tuesday-Thursday) from 12:00 AM-12:00 PM, while school was in session. Daily peak hour reports provided for morning, mid-day & afternoon peak hour study periods

TMC was performed with Miovision video VCU scout recording cameras for MDOT Traffic signal optimization project for 82 traffic signals located within Macomb, Wayne & Oakland Counties Metro Region, Routes: M-5, M-29, M-102, I-75BL(Perry), US-24, OLD M-14 (Ann Arbor Rd), M-1 CS 82121, 82141, 63022, 50072, 63091, 82053, 82101, 2131, 82293 - JN 124092 CON, Contract No. PS-45 Amendment for OHM Advisors.

Signalized controlled intersection, pedestrian signals for quadrants, no push buttons. VCU cameras were located within SW & SE intersection quadrant. All intersection shared video files have been uploaded to Miovision DataLink cloud platform.

Classification Summary Details & Percentages: Seven (7) Groupings:

- 1) Lights Includes: FHWA Classes 1-3 (Motorcycles, Pick Up Trucks, Vans, Light Goods Vehicles)***
- 2) Buses Includes: FHWA Class 4 (School Buses & Regional Transportation Metro Buses)***
- 3) Single-Unit Trucks Includes: FHWA Classes 5-7 (2-4 Axle SU Medium Trucks)***
- 4) Articulated Trucks Includes: FHWA Classes 8-12 (Heavy Trucks W/Single & Multi Unit Trailers)***
- 5) Bicycles On Road Includes: All bicycles on the roadway***
- 6) Bicycles On Crosswalk Includes: All bicycles using sidewalk***
- 7) Pedestrians Includes: All pedestrians using crosswalk***

82131-01-044_Sept 26_2019 Counts - TMC

Thu Sep 26, 2019

Full Length (12 AM-12 AM (+1))

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 701310, Location: 42.439232, -83.119959, Site Code: 82131-01-044 Traffic Data Collection, LLC



Traffic Data Collection

Provided by: Traffic Data Collection, TDC
7504 Sawgrass Drive, www.tdccounts.com,
Washington, MI, 48094, US

Leg Direction	M1 (Woodward) Southbound					State Fair Ave Westbound					M1 (Woodward) Northbound					Int
	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	
2019-09-26 12:00AM	41	0	1	42	3	6	6	0	12	5	4	35	0	39	0	93
12:15AM	24	1	1	26	0	6	3	0	9	1	7	29	0	36	0	71
12:30AM	29	0	2	31	0	7	4	0	11	1	5	22	1	28	0	70
12:45AM	28	0	3	31	1	0	5	0	5	0	1	18	0	19	0	55
Hourly Total	122	1	7	130	4	19	18	0	37	7	17	104	1	122	0	289
1:00AM	25	0	3	28	0	2	2	1	5	3	7	27	0	34	0	67
1:15AM	26	0	2	28	0	4	1	0	5	1	2	17	0	19	0	52
1:30AM	16	1	3	20	0	0	2	0	2	0	4	17	0	21	0	43
1:45AM	18	0	1	19	0	0	3	0	3	6	2	14	0	16	0	38
Hourly Total	85	1	9	95	0	6	8	1	15	10	15	75	0	90	0	200
2:00AM	12	0	0	12	0	1	6	0	7	0	3	11	0	14	0	33
2:15AM	13	0	1	14	0	1	1	0	2	2	4	8	0	12	0	28
2:30AM	7	0	2	9	0	1	4	0	5	1	4	7	0	11	0	25
2:45AM	17	0	0	17	0	2	3	0	5	4	3	9	0	12	2	34
Hourly Total	49	0	3	52	0	5	14	0	19	7	14	35	0	49	2	120
3:00AM	7	0	1	8	0	1	2	0	3	0	0	12	0	12	0	23
3:15AM	8	0	0	8	0	1	1	0	2	0	1	5	0	6	0	16
3:30AM	7	0	1	8	0	2	1	0	3	3	1	15	0	16	0	27
3:45AM	10	2	1	13	0	1	1	0	2	8	0	10	0	10	0	25
Hourly Total	32	2	3	37	0	5	5	0	10	11	2	42	0	44	0	91
4:00AM	12	0	0	12	0	1	2	0	3	4	1	14	0	15	0	30
4:15AM	14	0	0	14	0	6	2	0	8	2	2	13	0	15	0	37
4:30AM	18	0	1	19	0	4	0	0	4	5	2	9	0	11	0	34
4:45AM	27	1	3	31	0	2	1	0	3	6	1	17	0	18	0	52
Hourly Total	71	1	4	76	0	13	5	0	18	17	6	53	0	59	0	153
5:00AM	21	1	1	23	1	4	2	0	6	3	1	13	0	14	0	43
5:15AM	40	0	2	42	0	7	5	0	12	7	2	28	0	30	0	84
5:30AM	53	0	2	55	0	5	3	0	8	3	3	32	0	35	0	98
5:45AM	57	4	5	66	3	3	3	0	6	5	0	39	0	39	0	111
Hourly Total	171	5	10	186	4	19	13	0	32	18	6	112	0	118	0	336
6:00AM	106	2	3	111	0	11	6	0	17	4	5	49	0	54	0	182
6:15AM	142	0	3	145	0	14	8	0	22	6	3	56	0	59	0	226
6:30AM	219	2	3	224	2	12	1	0	13	2	2	73	0	75	0	312
6:45AM	302	0	2	304	0	22	8	0	30	2	7	93	0	100	2	434
Hourly Total	769	4	11	784	2	59	23	0	82	14	17	271	0	288	2	1154
7:00AM	452	1	4	457	0	16	8	0	24	10	8	128	0	136	3	617
7:15AM	636	1	4	641	0	33	13	0	46	9	9	176	0	185	2	872
7:30AM	872	2	8	882	1	33	16	1	50	9	9	212	0	221	2	1153
7:45AM	940	1	3	944	0	43	21	0	64	2	10	208	0	218	0	1226
Hourly Total	2900	5	19	2924	1	125	58	1	184	30	36	724	0	760	7	3868
8:00AM	911	1	4	916	2	37	19	0	56	5	12	204	0	216	3	1188
8:15AM	960	1	3	964	2	39	21	0	60	7	17	226	0	243	0	1267
8:30AM	892	1	5	898	0	35	15	0	50	5	19	173	0	192	2	1140
8:45AM	684	0	5	689	0	28	16	0	44	9	11	174	0	185	1	918
Hourly Total	3447	3	17	3467	4	139	71	0	210	26	59	777	0	836	6	4513
9:00AM	456	2	3	461	1	15	16	0	31	7	7	156	0	163	4	655
9:15AM	344	1	7	352	0	24	11	0	35	8	11	140	0	151	1	538
9:30AM	336	1	3	340	2	25	12	0	37	5	9	139	0	148	1	525
9:45AM	269	1	5	275	2	25	13	0	38	7	18	157	0	175	1	488
Hourly Total	1405	5	18	1428	5	89	52	0	141	27	45	592	0	637	7	2206
10:00AM	247	2	9	258	3	26	12	0	38	6	14	156	0	170	0	466
10:15AM	256	0	10	266	3	18	18	0	36	6	35	160	0	195	2	497

Leg Direction	M1 (Woodward) Southbound					State Fair Ave Westbound					M1 (Woodward) Northbound					Int
	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	
10:30AM	249	1	7	257	1	14	10	0	24	6	8	165	0	173	3	454
10:45AM	228	1	7	236	3	21	13	0	34	16	10	169	0	179	4	449
Hourly Total	980	4	33	1017	10	79	53	0	132	34	67	650	0	717	9	1866
11:00AM	246	1	4	251	1	21	13	0	34	10	13	181	0	194	1	479
11:15AM	241	0	6	247	1	12	13	0	25	5	13	199	0	212	1	484
11:30AM	240	2	9	251	1	30	14	0	44	4	11	207	0	218	0	513
11:45AM	266	1	4	271	0	32	14	0	46	6	14	220	0	234	0	551
Hourly Total	993	4	23	1020	3	95	54	0	149	25	51	807	0	858	2	2027
12:00PM	264	1	6	271	0	18	17	0	35	5	11	199	0	210	0	516
12:15PM	266	1	5	272	0	24	17	0	41	23	3	250	0	253	2	566
12:30PM	276	2	5	283	2	27	23	0	50	12	18	209	0	227	3	560
12:45PM	283	1	5	289	0	19	14	0	33	9	13	221	0	234	3	556
Hourly Total	1089	5	21	1115	2	88	71	0	159	49	45	879	0	924	8	2198
1:00PM	263	2	11	276	1	23	8	0	31	10	9	206	0	215	1	522
1:15PM	263	1	27	291	1	14	18	0	32	11	10	241	0	251	0	574
1:30PM	276	2	11	289	0	19	14	0	33	10	6	216	0	222	0	544
1:45PM	230	1	5	236	5	22	15	0	37	11	11	221	0	232	2	505
Hourly Total	1032	6	54	1092	7	78	55	0	133	42	36	884	0	920	3	2145
2:00PM	213	1	5	219	2	32	24	0	56	16	15	267	0	282	0	557
2:15PM	248	1	5	254	0	36	23	0	59	7	11	299	0	310	3	623
2:30PM	226	1	5	232	0	50	24	0	74	4	20	337	0	357	0	663
2:45PM	278	1	8	287	3	25	19	0	44	10	25	405	0	430	2	761
Hourly Total	965	4	23	992	5	143	90	0	233	37	71	1308	0	1379	5	2604
3:00PM	268	1	8	277	2	35	12	0	47	5	17	370	0	387	0	711
3:15PM	261	2	2	265	4	31	19	0	50	18	24	454	0	478	3	793
3:30PM	233	1	5	239	1	49	19	0	68	9	15	490	1	506	3	813
3:45PM	268	2	4	274	5	40	21	0	61	9	11	507	0	518	3	853
Hourly Total	1030	6	19	1055	12	155	71	0	226	41	67	1821	1	1889	9	3170
4:00PM	316	0	3	319	0	41	21	0	62	7	22	632	0	654	3	1035
4:15PM	364	1	10	375	6	44	23	1	68	6	29	698	0	727	3	1170
4:30PM	312	1	7	320	7	50	24	0	74	2	23	723	0	746	2	1140
4:45PM	348	2	7	357	1	40	16	0	56	3	28	788	0	816	1	1229
Hourly Total	1340	4	27	1371	14	175	84	1	260	18	102	2841	0	2943	9	4574
5:00PM	365	2	10	377	2	41	21	0	62	7	19	787	0	806	1	1245
5:15PM	393	1	9	403	1	33	21	0	54	5	26	888	0	914	0	1371
5:30PM	355	4	5	364	3	36	21	0	57	4	16	893	0	909	5	1330
5:45PM	377	1	3	381	2	50	14	0	64	3	18	847	0	865	0	1310
Hourly Total	1490	8	27	1525	8	160	77	0	237	19	79	3415	0	3494	6	5256
6:00PM	365	0	6	371	1	34	24	0	58	7	18	624	0	642	0	1071
6:15PM	325	2	5	332	0	36	22	0	58	10	19	474	0	493	2	883
6:30PM	325	1	6	332	2	38	15	0	53	8	15	430	0	445	0	830
6:45PM	266	1	8	275	0	26	20	0	46	10	16	335	0	351	1	672
Hourly Total	1281	4	25	1310	3	134	81	0	215	35	68	1863	0	1931	3	3456
7:00PM	221	1	4	226	0	19	18	0	37	4	15	270	0	285	1	548
7:15PM	217	2	2	221	1	19	17	0	36	8	12	244	0	256	2	513
7:30PM	211	0	5	216	1	26	17	0	43	8	14	260	0	274	0	533
7:45PM	199	3	4	206	0	21	17	0	38	6	12	213	0	225	1	469
Hourly Total	848	6	15	869	2	85	69	0	154	26	53	987	0	1040	4	2063
8:00PM	195	1	5	201	5	23	11	0	34	11	10	216	0	226	3	461
8:15PM	185	0	5	190	2	18	12	0	30	8	15	170	0	185	0	405
8:30PM	156	2	4	162	1	17	11	0	28	7	9	155	0	164	2	354
8:45PM	151	1	4	156	0	17	10	0	27	9	8	188	0	196	0	379
Hourly Total	687	4	18	709	8	75	44	0	119	35	42	729	0	771	5	1599
9:00PM	175	0	1	176	0	9	14	0	23	6	17	154	1	172	0	371
9:15PM	119	1	3	123	0	14	12	0	26	5	11	112	0	123	2	272
9:30PM	125	1	3	129	0	15	6	0	21	6	5	127	0	132	0	282
9:45PM	106	1	2	109	0	13	8	0	21	3	9	107	0	116	1	246
Hourly Total	525	3	9	537	0	51	40	0	91	20	42	500	1	543	3	1171
10:00PM	113	1	2	116	0	6	7	0	13	3	7	96	0	103	0	232
10:15PM	104	0	5	109	0	8	9	0	17	0	15	75	0	90	0	216

Leg Direction	M1 (Woodward) Southbound					State Fair Ave Westbound					M1 (Woodward) Northbound					Int
	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	
10:30PM	85	0	2	87	0	9	6	0	15	4	7	93	0	100	1	202
10:45PM	97	1	1	99	0	14	8	0	22	2	8	81	0	89	0	210
Hourly Total	399	2	10	411	0	37	30	0	67	9	37	345	0	382	1	860
11:00PM	75	0	5	80	1	7	5	0	12	6	7	52	0	59	0	151
11:15PM	73	0	2	75	0	7	13	0	20	3	10	47	0	57	0	152
11:30PM	63	0	1	64	0	4	2	0	6	6	10	44	0	54	0	124
11:45PM	59	0	2	61	0	8	7	0	15	2	5	41	0	46	0	122
Hourly Total	270	0	10	280	1	26	27	0	53	17	32	184	0	216	0	549
Total	21980	87	415	22482	95	1860	1113	3	2976	574	1009	19998	3	21010	91	46468
% Approach	97.8%	0.4%	1.8%	-	-	62.5%	37.4%	0.1%	-	-	4.8%	95.2%	0%	-	-	-
% Total	47.3%	0.2%	0.9%	48.4%	-	4.0%	2.4%	0%	6.4%	-	2.2%	43.0%	0%	45.2%	-	-
Lights	21479	16	184	21679	-	1734	1098	3	2835	-	966	19553	3	20522	-	45036
% Lights	97.7%	18.4%	44.3%	96.4%	-	93.2%	98.7%	100%	95.3%	-	95.7%	97.8%	100%	97.7%	-	96.9%
Single-Unit Trucks	168	1	2	171	-	18	11	0	29	-	14	159	0	173	-	373
% Single-Unit Trucks	0.8%	1.1%	0.5%	0.8%	-	1.0%	1.0%	0%	1.0%	-	1.4%	0.8%	0%	0.8%	-	0.8%
Articulated Trucks	80	0	0	80	-	5	2	0	7	-	1	50	0	51	-	138
% Articulated Trucks	0.4%	0%	0%	0.4%	-	0.3%	0.2%	0%	0.2%	-	0.1%	0.3%	0%	0.2%	-	0.3%
Buses	216	69	229	514	-	98	2	0	100	-	3	221	0	224	-	838
% Buses	1.0%	79.3%	55.2%	2.3%	-	5.3%	0.2%	0%	3.4%	-	0.3%	1.1%	0%	1.1%	-	1.8%
Bicycles on Road	37	1	0	38	-	5	0	0	5	-	25	15	0	40	-	83
% Bicycles on Road	0.2%	1.1%	0%	0.2%	-	0.3%	0%	0%	0.2%	-	2.5%	0.1%	0%	0.2%	-	0.2%
Pedestrians	-	-	-	-	88	-	-	-	-	516	-	-	-	-	81	-
% Pedestrians	-	-	-	-	92.6%	-	-	-	-	89.9%	-	-	-	-	89.0%	-
Bicycles on Crosswalk	-	-	-	-	7	-	-	-	-	58	-	-	-	-	10	-
% Bicycles on Crosswalk	-	-	-	-	7.4%	-	-	-	-	10.1%	-	-	-	-	11.0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

82131-01-044_Sept 26_2019 Counts - TMC

Thu Sep 26, 2019

Full Length (12 AM-12 AM (+1))

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

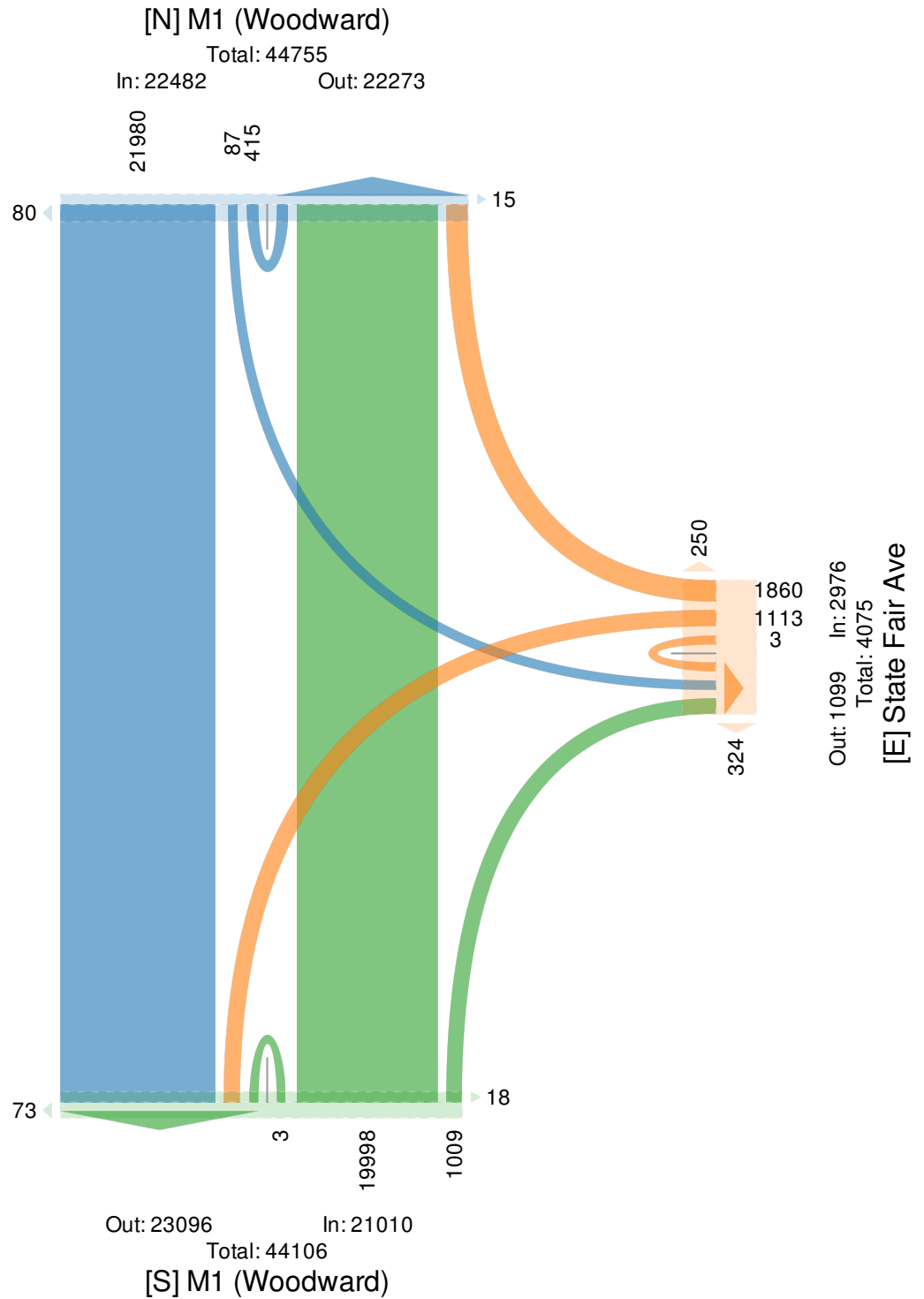
All Movements

ID: 701310, Location: 42.439232, -83.119959, Site Code: 82131-01-044 Traffic Data Collection, LLC



Traffic Data Collection

Provided by: Traffic Data Collection, TDC
7504 Sawgrass Drive, www.tdccounts.com,
Washington, MI, 48094, US



82131-01-044_Sept 26_2019 Counts - TMC

Thu Sep 26, 2019

AM Peak (7:30 AM - 8:30 AM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 701310, Location: 42.439232, -83.119959, Site Code: 82131-01-044 Traffic

Data Collection, LLC



Traffic Data Collection

Provided by: Traffic Data Collection, TDC
7504 Sawgrass Drive, www.tdccounts.com,
Washington, MI, 48094, US

Leg Direction	M1 (Woodward) Southbound					State Fair Ave Westbound					M1 (Woodward) Northbound					Int
	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	
2019-09-26 7:30AM	872	2	8	882	1	33	16	1	50	9	9	212	0	221	2	1153
7:45AM	940	1	3	944	0	43	21	0	64	2	10	208	0	218	0	1226
8:00AM	911	1	4	916	2	37	19	0	56	5	12	204	0	216	3	1188
8:15AM	960	1	3	964	2	39	21	0	60	7	17	226	0	243	0	1267
Total	3683	5	18	3706	5	152	77	1	230	23	48	850	0	898	5	4834
% Approach	99.4%	0.1%	0.5%	-	-	66.1%	33.5%	0.4%	-	-	5.3%	94.7%	0%	-	-	-
% Total	76.2%	0.1%	0.4%	76.7%	-	3.1%	1.6%	0%	4.8%	-	1.0%	17.6%	0%	18.6%	-	-
PHF	0.959	0.625	0.563	0.961	-	0.884	0.917	0.250	0.898	-	0.706	0.940	-	0.924	-	0.954
Lights	3644	0	8	3652	-	146	77	1	224	-	48	820	0	868	-	4744
% Lights	98.9%	0%	44.4%	98.5%	-	96.1%	100%	100%	97.4%	-	100%	96.5%	0%	96.7%	-	98.1%
Single-Unit Trucks	18	0	0	18	-	0	0	0	0	-	0	11	0	11	-	29
% Single-Unit Trucks	0.5%	0%	0%	0.5%	-	0%	0%	0%	0%	-	0%	1.3%	0%	1.2%	-	0.6%
Articulated Trucks	7	0	0	7	-	0	0	0	0	-	0	3	0	3	-	10
% Articulated Trucks	0.2%	0%	0%	0.2%	-	0%	0%	0%	0%	-	0%	0.4%	0%	0.3%	-	0.2%
Buses	14	5	10	29	-	6	0	0	6	-	0	16	0	16	-	51
% Buses	0.4%	100%	55.6%	0.8%	-	3.9%	0%	0%	2.6%	-	0%	1.9%	0%	1.8%	-	1.1%
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	5	-	-	-	-	23	-	-	-	-	-	4
% Pedestrians	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-	-	80.0%
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	1
% Bicycles on Crosswalk	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-	20.0%

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

82131-01-044_Sept 26_2019 Counts - TMC

Thu Sep 26, 2019

AM Peak (7:30 AM - 8:30 AM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

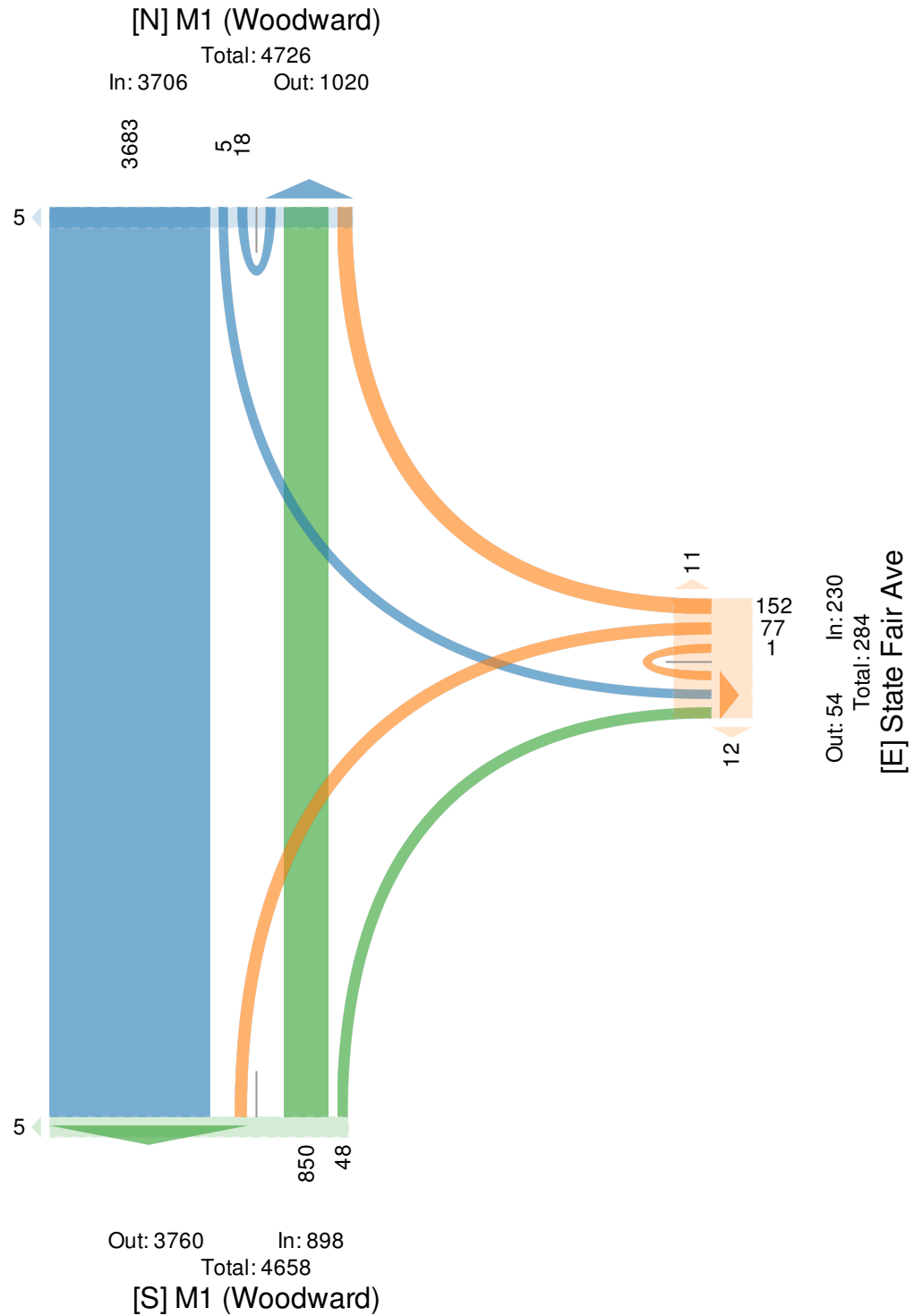
All Movements

ID: 701310, Location: 42.439232, -83.119959, Site Code: 82131-01-044 Traffic
Data Collection, LLC



Traffic Data Collection

Provided by: Traffic Data Collection, TDC
7504 Sawgrass Drive, www.tdccounts.com,
Washington, MI, 48094, US



82131-01-044_Sept 26_2019 Counts - TMC

Thu Sep 26, 2019

Midday Peak (12 PM - 1 PM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 701310, Location: 42.439232, -83.119959, Site Code: 82131-01-044 Traffic

Data Collection, LLC



Traffic Data Collection

Provided by: Traffic Data Collection, TDC
7504 Sawgrass Drive, www.tdccounts.com,
Washington, MI, 48094, US

Leg Direction	M1 (Woodward) Southbound					State Fair Ave Westbound					M1 (Woodward) Northbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2019-09-26 12:00PM	264	1	6	271	0	18	17	0	35	5	11	199	0	210	0	516
12:15PM	266	1	5	272	0	24	17	0	41	23	3	250	0	253	2	566
12:30PM	276	2	5	283	2	27	23	0	50	12	18	209	0	227	3	560
12:45PM	283	1	5	289	0	19	14	0	33	9	13	221	0	234	3	556
Total	1089	5	21	1115	2	88	71	0	159	49	45	879	0	924	8	2198
% Approach	97.7%	0.4%	1.9%	-	-	55.3%	44.7%	0%	-	-	4.9%	95.1%	0%	-	-	-
% Total	49.5%	0.2%	1.0%	50.7%	-	4.0%	3.2%	0%	7.2%	-	2.0%	40.0%	0%	42.0%	-	-
PHF	0.962	0.625	0.875	0.965	-	0.806	0.772	-	0.790	-	0.625	0.878	-	0.912	-	0.972
Lights	1050	1	8	1059	-	81	70	0	151	-	42	857	0	899	-	2109
% Lights	96.4%	20.0%	38.1%	95.0%	-	92.0%	98.6%	0%	95.0%	-	93.3%	97.5%	0%	97.3%	-	96.0%
Single-Unit Trucks	17	0	0	17	-	1	1	0	2	-	3	12	0	15	-	34
% Single-Unit Trucks	1.6%	0%	0%	1.5%	-	1.1%	1.4%	0%	1.3%	-	6.7%	1.4%	0%	1.6%	-	1.5%
Articulated Trucks	10	0	0	10	-	0	0	0	0	-	0	0	0	0	-	10
% Articulated Trucks	0.9%	0%	0%	0.9%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0.5%
Buses	12	4	13	29	-	5	0	0	5	-	0	9	0	9	-	43
% Buses	1.1%	80.0%	61.9%	2.6%	-	5.7%	0%	0%	3.1%	-	0%	1.0%	0%	1.0%	-	2.0%
Bicycles on Road	0	0	0	0	-	1	0	0	1	-	0	1	0	1	-	2
% Bicycles on Road	0%	0%	0%	0%	-	1.1%	0%	0%	0.6%	-	0%	0.1%	0%	0.1%	-	0.1%
Pedestrians	-	-	-	-	2	-	-	-	-	43	-	-	-	-	8	-
% Pedestrians	-	-	-	-	100%	-	-	-	-	87.8%	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	6	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	0%	-	-	-	-	12.2%	-	-	-	-	0%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

82131-01-044_Sept 26_2019 Counts - TMC

Thu Sep 26, 2019

Midday Peak (12 PM - 1 PM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

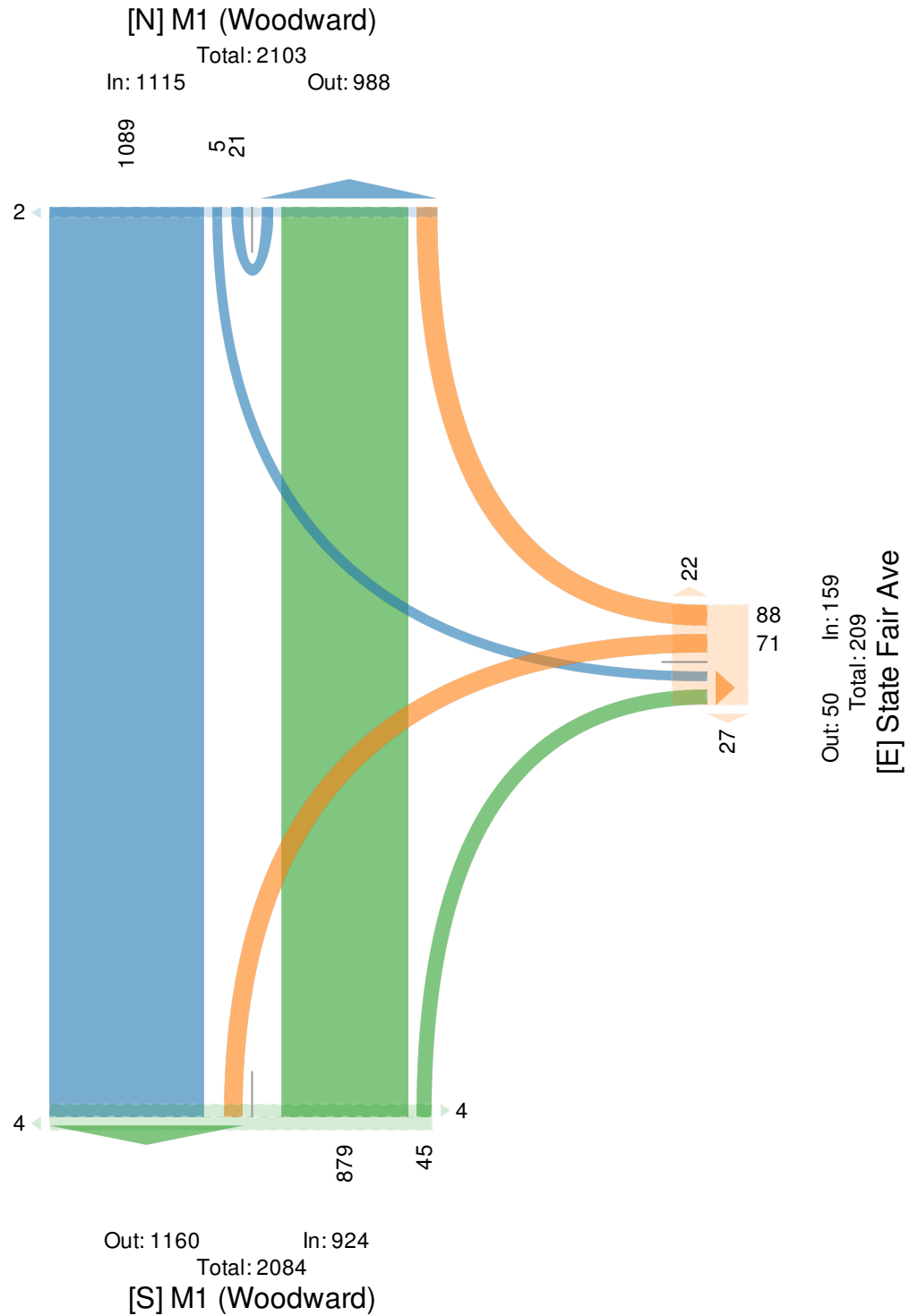
All Movements

ID: 701310, Location: 42.439232, -83.119959, Site Code: 82131-01-044 Traffic
Data Collection, LLC



Traffic Data Collection

Provided by: Traffic Data Collection, TDC
7504 Sawgrass Drive, www.tdccounts.com,
Washington, MI, 48094, US



82131-01-044_Sept 26_2019 Counts - TMC

Thu Sep 26, 2019

PM Peak (5 PM - 6 PM) - Overall Peak Hour

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 701310, Location: 42.439232, -83.119959, Site Code: 82131-01-044 Traffic

Data Collection, LLC



Traffic Data Collection

Provided by: Traffic Data Collection, TDC
7504 Sawgrass Drive, www.tdccounts.com,
Washington, MI, 48094, US

Leg Direction	M1 (Woodward) Southbound					State Fair Ave Westbound					M1 (Woodward) Northbound					Int
	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	
2019-09-26 5:00PM	365	2	10	377	2	41	21	0	62	7	19	787	0	806	1	1245
5:15PM	393	1	9	403	1	33	21	0	54	5	26	888	0	914	0	1371
5:30PM	355	4	5	364	3	36	21	0	57	4	16	893	0	909	5	1330
5:45PM	377	1	3	381	2	50	14	0	64	3	18	847	0	865	0	1310
Total	1490	8	27	1525	8	160	77	0	237	19	79	3415	0	3494	6	5256
% Approach	97.7%	0.5%	1.8%	-	-	67.5%	32.5%	0%	-	-	2.3%	97.7%	0%	-	-	-
% Total	28.3%	0.2%	0.5%	29.0%	-	3.0%	1.5%	0%	4.5%	-	1.5%	65.0%	0%	66.5%	-	-
PHF	0.950	0.583	0.675	0.947	-	0.800	0.917	-	0.926	-	0.760	0.957	-	0.955	-	0.959
Lights	1466	3	15	1484	-	152	76	0	228	-	79	3377	0	3456	-	5168
% Lights	98.4%	37.5%	55.6%	97.3%	-	95.0%	98.7%	0%	96.2%	-	100%	98.9%	0%	98.9%	-	98.3%
Single-Unit Trucks	7	0	0	7	-	3	1	0	4	-	0	13	0	13	-	24
% Single-Unit Trucks	0.5%	0%	0%	0.5%	-	1.9%	1.3%	0%	1.7%	-	0%	0.4%	0%	0.4%	-	0.5%
Articulated Trucks	3	0	0	3	-	0	0	0	0	-	0	2	0	2	-	5
% Articulated Trucks	0.2%	0%	0%	0.2%	-	0%	0%	0%	0%	-	0%	0.1%	0%	0.1%	-	0.1%
Buses	13	4	12	29	-	5	0	0	5	-	0	22	0	22	-	56
% Buses	0.9%	50.0%	44.4%	1.9%	-	3.1%	0%	0%	2.1%	-	0%	0.6%	0%	0.6%	-	1.1%
Bicycles on Road	1	1	0	2	-	0	0	0	0	-	0	1	0	1	-	3
% Bicycles on Road	0.1%	12.5%	0%	0.1%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0.1%
Pedestrians	-	-	-	-	6	-	-	-	-	18	-	-	-	-	5	-
% Pedestrians	-	-	-	-	75.0%	-	-	-	-	94.7%	-	-	-	-	83.3%	-
Bicycles on Crosswalk	-	-	-	-	2	-	-	-	-	1	-	-	-	-	1	-
% Bicycles on Crosswalk	-	-	-	-	25.0%	-	-	-	-	5.3%	-	-	-	-	16.7%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

82131-01-044_Sept 26_2019 Counts - TMC

Thu Sep 26, 2019

PM Peak (5 PM - 6 PM) - Overall Peak Hour

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

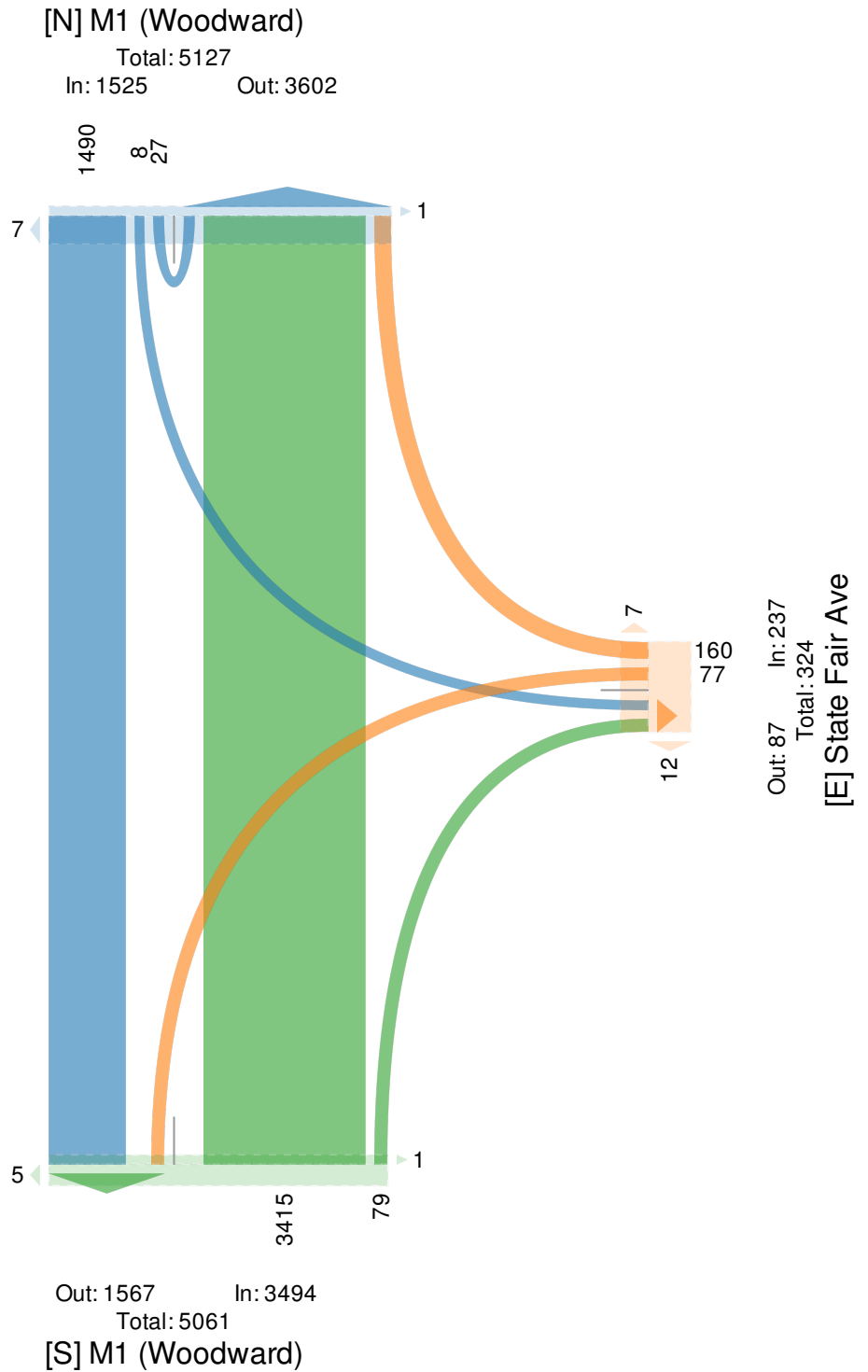
All Movements

ID: 701310, Location: 42.439232, -83.119959, Site Code: 82131-01-044 Traffic Data Collection, LLC



Traffic Data Collection

Provided by: Traffic Data Collection, TDC
7504 Sawgrass Drive, www.tdccounts.com,
Washington, MI, 48094, US



John R Street & West State Fair Avenue - TMC

Thu Jul 16, 2020

Full Length (6 AM-9 AM, 4 PM-7 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 770631, Location: 42.439515, -83.102559



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	State Faire Eastbound						State Faire Westbound						John St Northbound						John St Southbound						Int
	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	
2020-07-16 6:00AM	1	2	2	0	5	0	1	11	4	0	16	0	2	14	6	0	22	0	1	13	1	0	15	0	58
6:15AM	0	4	3	0	7	0	4	13	1	0	18	0	2	5	2	0	9	0	1	11	2	0	14	0	48
6:30AM	2	9	1	0	12	0	5	8	2	0	15	0	0	6	6	0	12	0	3	11	3	0	17	0	56
6:45AM	2	3	1	0	6	0	6	21	4	0	31	0	2	7	1	0	10	0	1	20	0	0	21	0	68
Hourly Total	5	18	7	0	30	0	16	53	11	0	80	0	6	32	15	0	53	0	6	55	6	0	67	0	230
7:00AM	2	6	1	0	9	0	10	15	5	0	30	0	1	8	3	0	12	0	2	23	2	0	27	1	78
7:15AM	1	7	1	0	9	0	8	17	3	0	28	1	1	12	3	0	16	0	7	11	0	0	18	0	71
7:30AM	3	2	0	0	5	0	7	27	4	0	38	1	1	12	1	0	14	1	2	23	3	0	28	0	85
7:45AM	3	7	1	0	11	0	7	21	4	0	32	1	3	21	6	0	30	0	5	19	1	0	25	1	98
Hourly Total	9	22	3	0	34	0	32	80	16	0	128	3	6	53	13	0	72	1	16	76	6	0	98	2	332
8:00AM	2	9	1	0	12	0	6	19	4	0	29	0	2	14	3	0	19	0	1	24	6	0	31	2	91
8:15AM	1	5	1	0	7	0	7	25	4	0	36	0	2	15	5	0	22	0	2	29	1	0	32	1	97
8:30AM	3	7	1	0	11	2	2	29	4	0	35	0	0	20	6	0	26	0	5	17	2	0	24	0	96
8:45AM	1	11	1	0	13	0	8	34	7	0	49	0	7	16	3	0	26	0	3	20	0	0	23	4	111
Hourly Total	7	32	4	0	43	2	23	107	19	0	149	0	11	65	17	0	93	0	11	90	9	0	110	7	395
4:00PM	8	25	6	0	39	0	11	53	9	0	73	1	7	47	7	0	61	1	5	29	4	0	38	0	211
4:15PM	3	21	3	0	27	0	15	46	10	0	71	0	8	55	15	0	78	1	11	39	6	0	56	3	232
4:30PM	3	22	2	0	27	0	13	64	11	0	88	0	10	39	11	0	60	0	4	27	6	0	37	3	212
4:45PM	3	18	0	0	21	0	15	48	15	0	78	0	8	42	12	0	62	1	13	29	5	0	47	2	208
Hourly Total	17	86	11	0	114	0	54	211	45	0	310	1	33	183	45	0	261	3	33	124	21	0	178	8	863
5:00PM	4	14	4	0	22	0	15	48	9	0	72	1	13	45	15	0	73	0	15	31	4	0	50	0	217
5:15PM	4	23	3	0	30	0	15	52	8	0	75	1	3	38	19	0	60	1	9	23	9	0	41	2	206
5:30PM	3	19	1	0	23	1	22	34	7	0	63	1	4	45	17	0	66	0	11	34	4	0	49	1	201
5:45PM	1	26	0	0	27	0	17	42	6	0	65	0	5	37	12	0	54	0	9	28	4	0	41	4	187
Hourly Total	12	82	8	0	102	1	69	176	30	0	275	3	25	165	63	0	253	1	44	116	21	0	181	7	811
6:00PM	7	25	1	0	33	0	13	36	13	0	62	0	4	43	23	0	70	0	8	18	4	0	30	2	195
6:15PM	1	18	5	0	24	2	10	39	12	0	61	0	4	35	8	0	47	0	9	18	3	0	30	2	162
6:30PM	6	20	1	0	27	0	22	37	10	0	69	0	2	31	12	0	45	0	15	23	7	0	45	1	186
6:45PM	3	15	3	0	21	0	8	34	10	0	52	0	0	27	10	0	37	0	10	25	3	0	38	0	148
Hourly Total	17	78	10	0	105	2	53	146	45	0	244	0	10	136	53	0	199	0	42	84	17	0	143	5	691
Total	67	318	43	0	428	5	247	773	166	0	1186	7	91	634	206	0	931	5	152	545	80	0	777	29	3322
% Approach	15.7%	74.3%	10.0%	0%	-	-	20.8%	65.2%	14.0%	0%	-	-	9.8%	68.1%	22.1%	0%	-	-	19.6%	70.1%	10.3%	0%	-	-	-
% Total	2.0%	9.6%	1.3%	0%	12.9%	-	7.4%	23.3%	5.0%	0%	35.7%	-	2.7%	19.1%	6.2%	0%	28.0%	-	4.6%	16.4%	2.4%	0%	23.4%	-	-
Lights	55	304	43	0	402	-	245	755	164	0	1164	-	80	623	206	0	909	-	150	521	68	0	739	-	3214
% Lights	82.1%	95.6%	100%	0%	93.9%	-	99.2%	97.7%	98.8%	0%	98.1%	-	87.9%	98.3%	100%	0%	97.6%	-	98.7%	95.6%	85.0%	0%	95.1%	-	96.7%
Articulated Trucks	0	0	0	0	0	-	0	2	0	0	2	-	1	0	0	0	1	-	0	5	0	0	5	-	8
% Articulated Trucks	0%	0%	0%	0%	0%	-	0%	0.3%	0%	0%	0.2%	-	1.1%	0%	0%	0%	0.1%	-	0%	0.9%	0%	0%	0.6%	-	0.2%
Buses and Single-Unit Trucks	12	14	0	0	26	-	2	16	2	0	20	-	10	11	0	0	21	-	2	19	12	0	33	-	100
% Buses and Single-Unit Trucks	17.9%	4.4%	0%	0%	6.1%	-	0.8%	2.1%	1.2%	0%	1.7%	-	11.0%	1.7%	0%	0%	2.3%	-	1.3%	3.5%	15.0%	0%	4.2%	-	3.0%
Pedestrians	-	-	-	-	-	4	-	-	-	-	-	2	-	-	-	-	-	1	-	-	-	-	-	23	-
% Pedestrians	-	-	-	-	-	80.0%	-	-	-	-	-	28.6%	-	-	-	-	-	20.0%	-	-	-	-	-	79.3%	-
Bicycles on Crosswalk	-	-	-	-	-	1	-	-	-	-	-	5	-	-	-	-	-	4	-	-	-	-	-	6	-
% Bicycles on Crosswalk	-	-	-	-	-	20.0%	-	-	-	-	-	71.4%	-	-	-	-	-	80.0%	-	-	-	-	-	20.7%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

John R Street & West State Fair Avenue - TMC

Thu Jul 16, 2020

Full Length (6 AM-9 AM, 4 PM-7 PM)

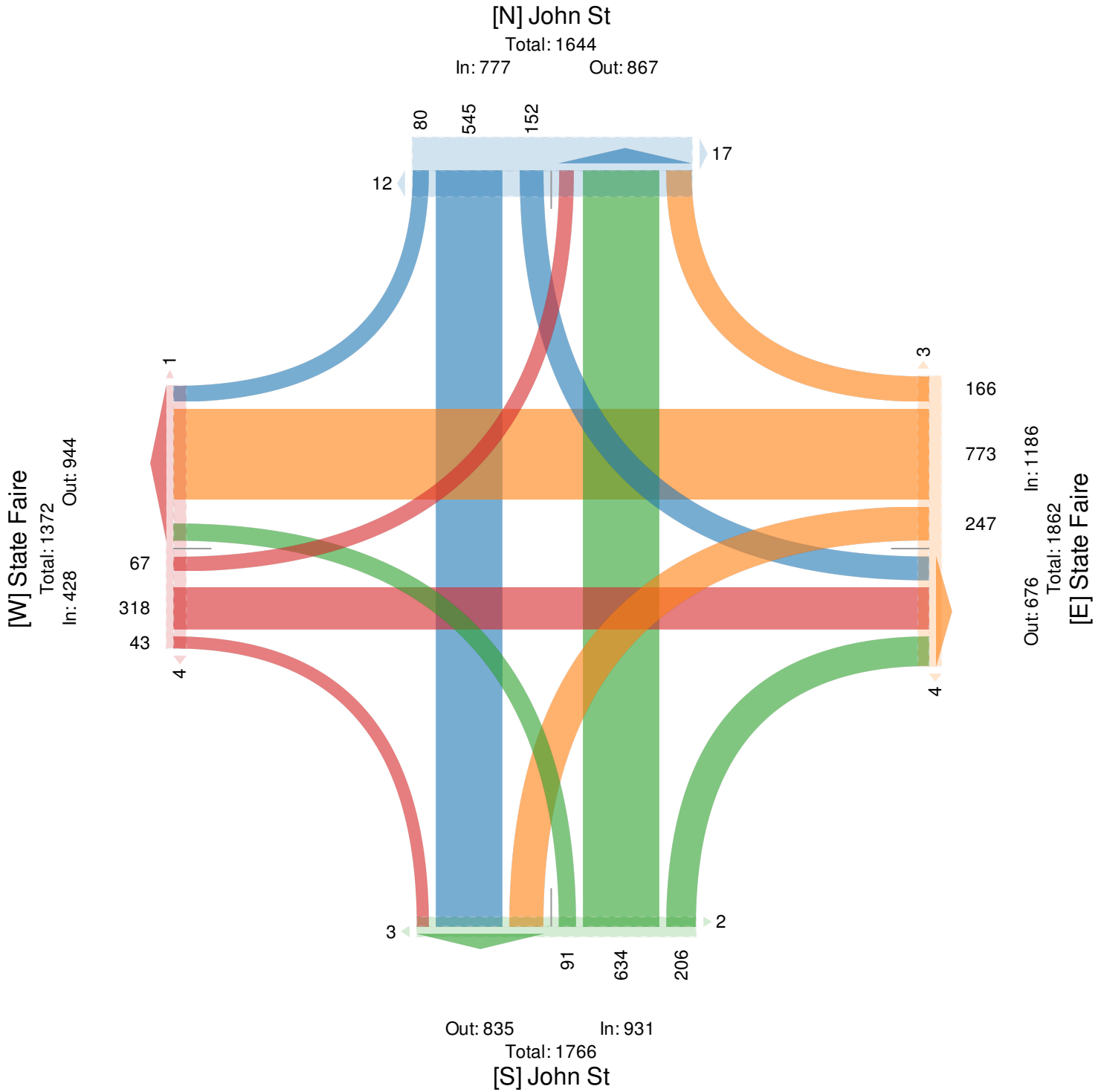
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 770631, Location: 42.439515, -83.102559



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



John R Street & West State Fair Avenue - TMC

Thu Jul 16, 2020

AM Peak (8 AM - 9 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 770631, Location: 42.439515, -83.102559



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	State Faire Eastbound						State Faire Westbound						John St Northbound						John St Southbound						Int
	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	
2020-07-16 8:00AM	2	9	1	0	12	0	6	19	4	0	29	0	2	14	3	0	19	0	1	24	6	0	31	2	91
8:15AM	1	5	1	0	7	0	7	25	4	0	36	0	2	15	5	0	22	0	2	29	1	0	32	1	97
8:30AM	3	7	1	0	11	2	2	29	4	0	35	0	0	20	6	0	26	0	5	17	2	0	24	0	96
8:45AM	1	11	1	0	13	0	8	34	7	0	49	0	7	16	3	0	26	0	3	20	0	0	23	4	111
Total	7	32	4	0	43	2	23	107	19	0	149	0	11	65	17	0	93	0	11	90	9	0	110	7	395
% Approach	16.3%	74.4%	9.3%	0%	-	-	15.4%	71.8%	12.8%	0%	-	-	11.8%	69.9%	18.3%	0%	-	-	10.0%	81.8%	8.2%	0%	-	-	-
% Total	1.8%	8.1%	1.0%	0%	10.9%	-	5.8%	27.1%	4.8%	0%	37.7%	-	2.8%	16.5%	4.3%	0%	23.5%	-	2.8%	22.8%	2.3%	0%	27.8%	-	-
PHF	0.583	0.727	1.000	-	0.827	-	0.719	0.787	0.679	-	0.760	-	0.393	0.813	0.708	-	0.894	-	0.550	0.776	0.375	-	0.859	-	0.890
Lights	5	30	4	0	39	-	23	103	19	0	145	-	10	62	17	0	89	-	10	81	7	0	98	-	371
% Lights	71.4%	93.8%	100%	0%	90.7%	-	100%	96.3%	100%	0%	97.3%	-	90.9%	95.4%	100%	0%	95.7%	-	90.9%	90.0%	77.8%	0%	89.1%	-	93.9%
Articulated Trucks	0	0	0	0	0	-	0	1	0	0	1	-	0	0	0	0	0	-	0	2	0	0	2	-	3
% Articulated Trucks	0%	0%	0%	0%	0%	-	0%	0.9%	0%	0%	0.7%	-	0%	0%	0%	0%	0%	-	0%	2.2%	0%	0%	1.8%	-	0.8%
Buses and Single-Unit Trucks	2	2	0	0	4	-	0	3	0	0	3	-	1	3	0	0	4	-	1	7	2	0	10	-	21
% Buses and Single-Unit Trucks	28.6%	6.3%	0%	0%	9.3%	-	0%	2.8%	0%	0%	2.0%	-	9.1%	4.6%	0%	0%	4.3%	-	9.1%	7.8%	22.2%	0%	9.1%	-	5.3%
Pedestrians	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	7	-
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

John R Street & West State Fair Avenue - TMC

Thu Jul 16, 2020

AM Peak (8 AM - 9 AM)

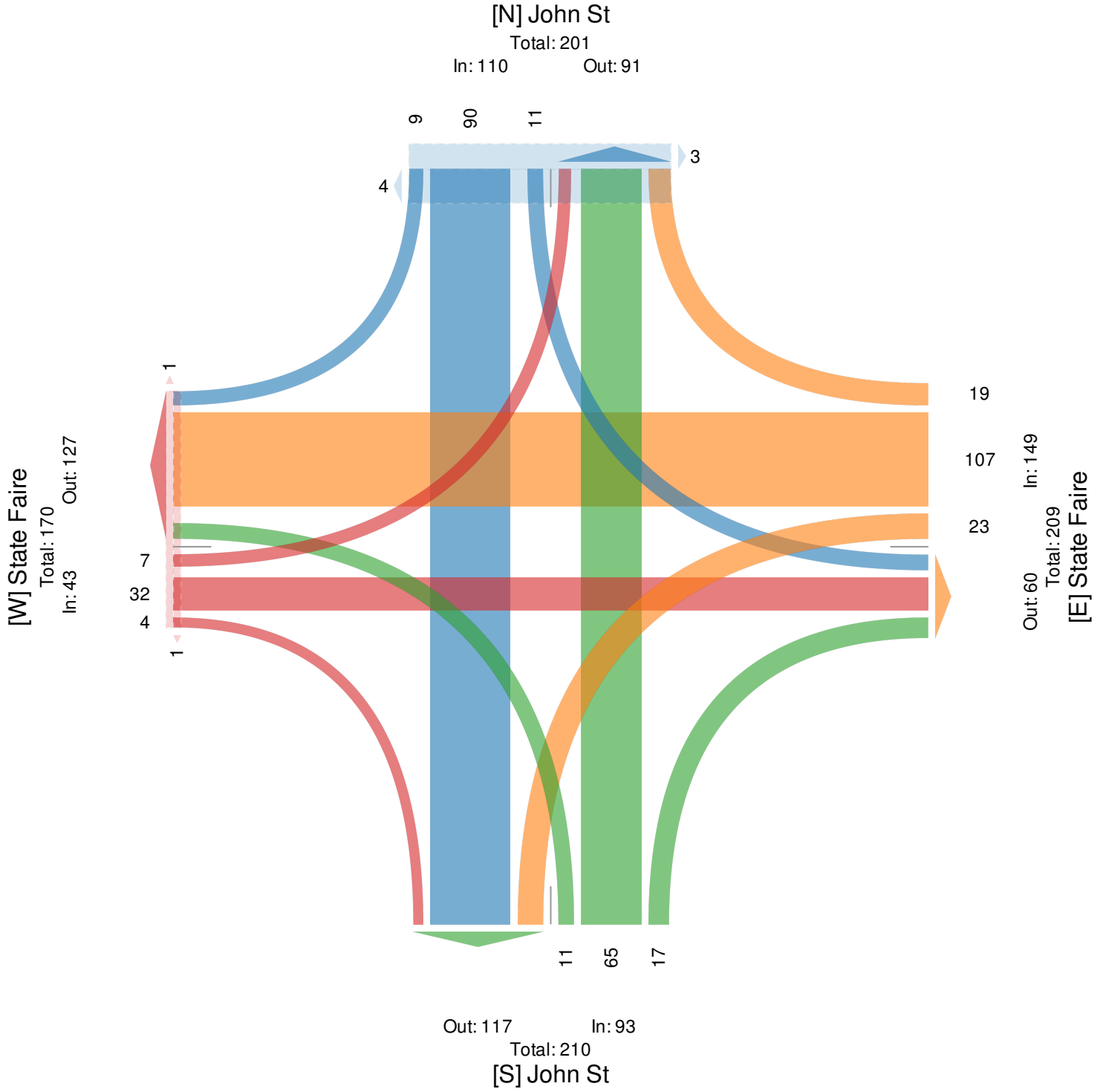
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 770631, Location: 42.439515, -83.102559



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



John R Street & West State Fair Avenue - TMC

Thu Jul 16, 2020

PM Peak (4:15 PM - 5:15 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 770631, Location: 42.439515, -83.102559



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	State Faire Eastbound					State Faire Westbound					John St Northbound					John St Southbound					Int				
	L	T	R	U	App Ped*	L	T	R	U	App Ped*	L	T	R	U	App Ped*	L	T	R	U	App Ped*					
2020-07-16 4:15PM	3	21	3	0	27	0	15	46	10	0	71	0	8	55	15	0	78	1	11	39	6	0	56	3	232
4:30PM	3	22	2	0	27	0	13	64	11	0	88	0	10	39	11	0	60	0	4	27	6	0	37	3	212
4:45PM	3	18	0	0	21	0	15	48	15	0	78	0	8	42	12	0	62	1	13	29	5	0	47	2	208
5:00PM	4	14	4	0	22	0	15	48	9	0	72	1	13	45	15	0	73	0	15	31	4	0	50	0	217
Total	13	75	9	0	97	0	58	206	45	0	309	1	39	181	53	0	273	2	43	126	21	0	190	8	869
% Approach	13.4%	77.3%	9.3%	0%	-	-	18.8%	66.7%	14.6%	0%	-	-	14.3%	66.3%	19.4%	0%	-	-	22.6%	66.3%	11.1%	0%	-	-	-
% Total	1.5%	8.6%	1.0%	0%	11.2%	-	6.7%	23.7%	5.2%	0%	35.6%	-	4.5%	20.8%	6.1%	0%	31.4%	-	4.9%	14.5%	2.4%	0%	21.9%	-	-
PHF	0.813	0.852	0.563	-	0.898	-	0.967	0.805	0.750	-	0.878	-	0.750	0.823	0.883	-	0.875	-	0.717	0.808	0.875	-	0.848	-	0.936
Lights	11	74	9	0	94	-	58	202	44	0	304	-	35	178	53	0	266	-	43	124	19	0	186	-	850
% Lights	84.6%	98.7%	100%	0%	96.9%	-	100%	98.1%	97.8%	0%	98.4%	-	89.7%	98.3%	100%	0%	97.4%	-	100%	98.4%	90.5%	0%	97.9%	-	97.8%
Articulated Trucks	0	0	0	0	0	-	0	0	0	0	0	-	1	0	0	0	1	-	0	0	0	0	0	-	1
% Articulated Trucks	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	2.6%	0%	0%	0%	0.4%	-	0%	0%	0%	0%	0%	-	0.1%
Buses and Single-Unit Trucks	2	1	0	0	3	-	0	4	1	0	5	-	3	3	0	0	6	-	0	2	2	0	4	-	18
% Buses and Single-Unit Trucks	15.4%	1.3%	0%	0%	3.1%	-	0%	1.9%	2.2%	0%	1.6%	-	7.7%	1.7%	0%	0%	2.2%	-	0%	1.6%	9.5%	0%	2.1%	-	2.1%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	4
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	50.0%	-	-	-	-	-	-	50.0%
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	-	4
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	50.0%	-	-	-	-	-	-	50.0%

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

John R Street & West State Fair Avenue - TMC

Thu Jul 16, 2020

PM Peak (4:15 PM - 5:15 PM) - Overall Peak Hour

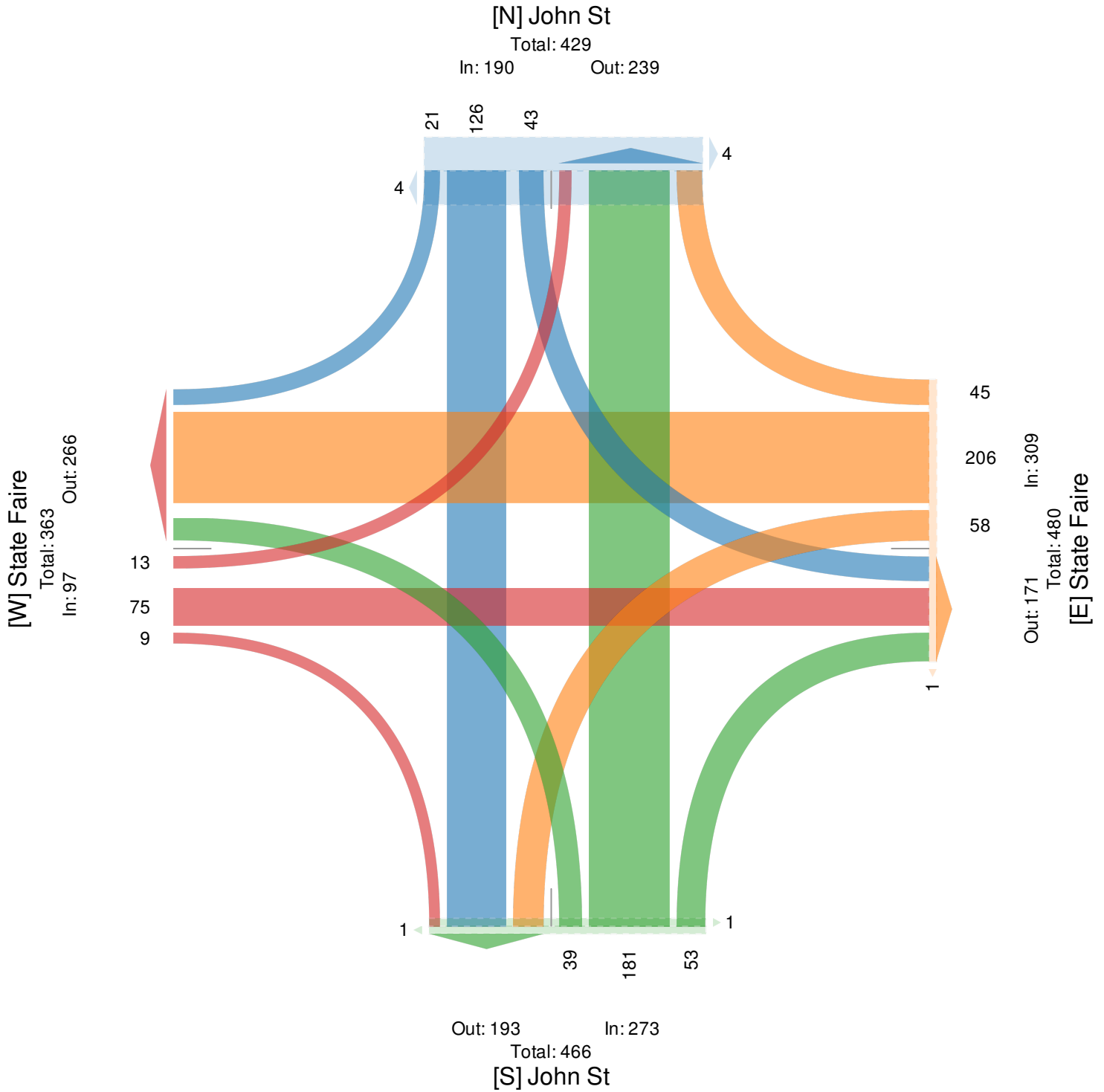
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 770631, Location: 42.439515, -83.102559



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



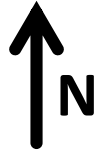
APPENDIX – B

Field Inventory Sketches / Signal Plans

Intersection 1

8 Mile Rd & Site
Driveway A

Signalized



25 MPH*

Driveway

11'

14'

12'

8 Mile Rd
(WB)

40 MPH

324'

12'

11'

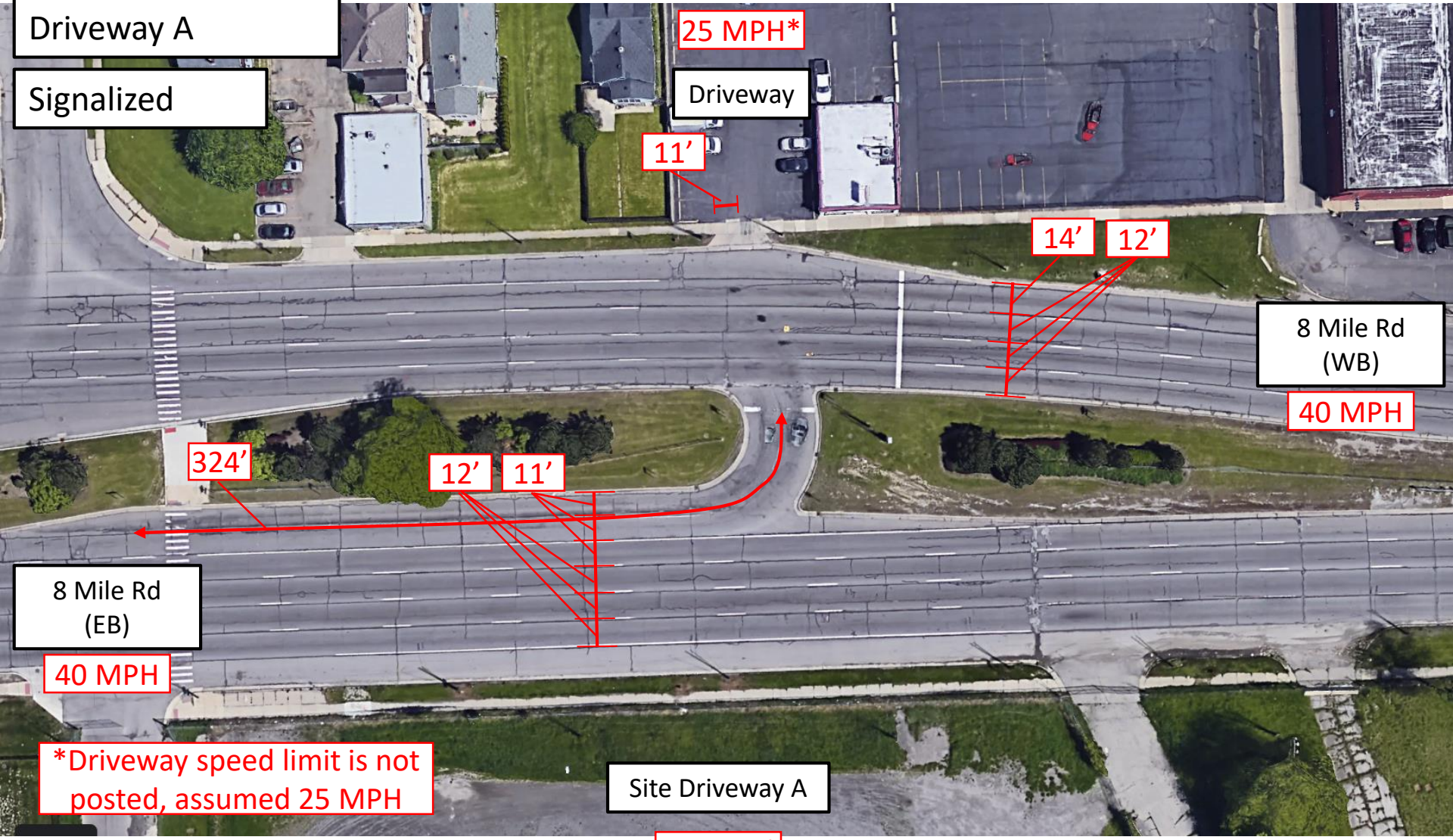
8 Mile Rd
(EB)

40 MPH

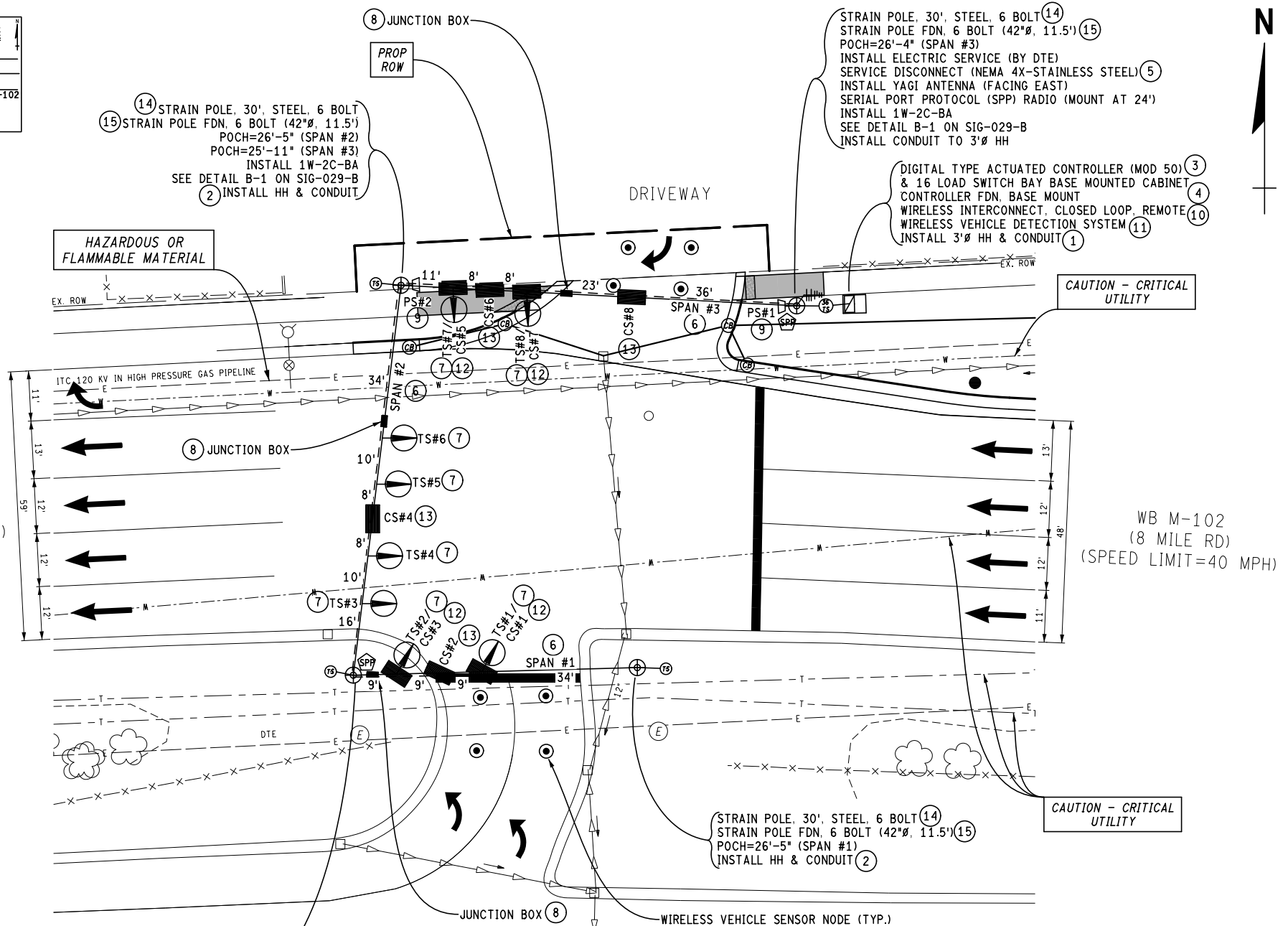
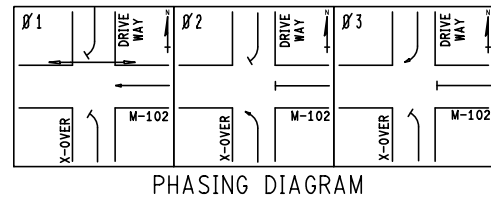
Site Driveway A

25 MPH*

*Driveway speed limit is not posted, assumed 25 MPH

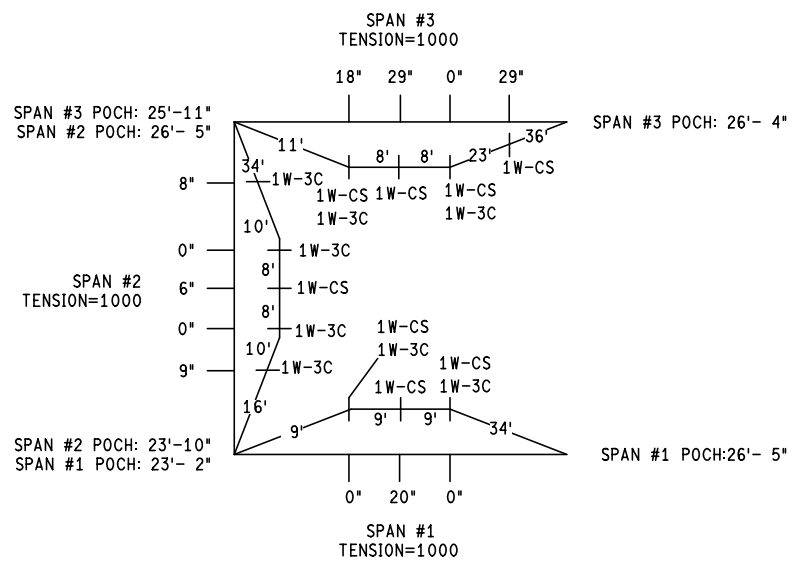


LIST OF MATERIAL		FOR INFORMATION ONLY
NO.	ITEM	QUANTITIES
1	Hh, Round, 3 foot Dia.	1 Ea
2	Hh, Round	3 Ea
3	Controller and Cabinet, Digital Type	1 Ea
4	Controller Fdn, Base Mount	1 Ea
5	Serv Disconnect	1 Ea
6	Span Wire	3 Ea
7	TS, One Way Span Wire Mtd (LED)	8 Ea
8	Junction Box, Span Wire	3 Ea
9	TS, Pedestrian, One Way Bracket Arm Mtd (LED) Countdown	2 Ea
10	Wireless Intercon, Closed Loop, Remote	1 Ea
11	Wireless Vehicle Detection System	1 Ea
12	Case Sign, One Way, 12 inch by 27 inch, Non-Illuminated	4 Ea
13	Case Sign, One Way, 24 inch by 30 inch, Non-Illuminated	4 Ea
14	Strain Pole, Steel, 6 bolt, 30 foot	4 Ea
15	Strain Pole Fdn, 6 Bolt	46 Ft
16	Wireless Vehicle Sensor Node	8 Ea
17	Conduit, DB, 1, 1 1/2 inch	50 Ft
18	Conduit, DB, 3, 3 inch	40 Ft
19	Conduit, DB, 4, 3 inch	10 Ft
20	Cable, Sec, 600V, 1, 3/C#6	100 Ft
21	Power Co. (Est. Cost to Contractor)	X Dir

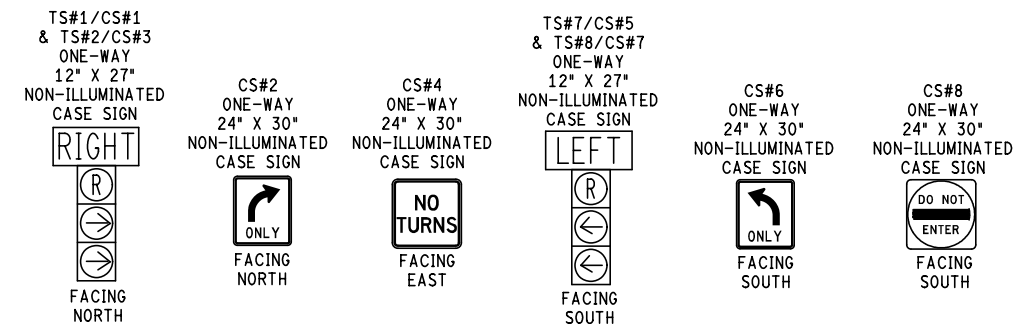
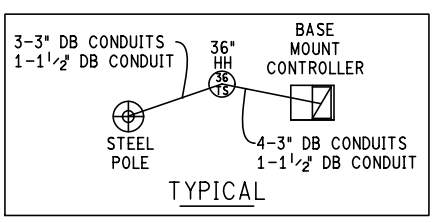


- NOTES TO CONTRACTOR:
- CONTACT CHRIS JAMES (248-361-1318), MDOT AREA SOILS ENGINEER, 3 DAYS PRIOR TO THE EXCAVATION AND CONSTRUCTION OF THE PROPOSED FOUNDATION TO VERIFY SOIL AND GROUNDWATER CONDITIONS.
 - FOR ELECTRICAL SERVICE INSPECTION CONTACT THE MICHIGAN DEPARTMENT OF LICENSING & REGULATORY AFFAIRS AT 248-496-0916. COST TO CONTRACTOR WILL BE INCIDENTAL.
 - CONTACT xxxxxxxxxxxxxx (xxx-xxx-xxxx), DETROIT EDISON CO., FOR INSTALLATION OF ELECTRIC SERVICE. ESTIMATED COST TO CONTRACTOR IS \$xxxx.
 - SEE SHEETS "SIGNAL 5" & "SIGNAL 6" FOR QUADRANT DETAILS SHOWING POLE DIMENSIONS.
 - WIRELESS DETECTION SYSTEM LOCATION TO BE DETERMINED BY THE STATEWIDE SIGNAL INSPECTOR (JIM KWAPISEZEWSKI, 517-242-1486) AND THE MDOT TSC TRAFFIC & SAFETY ENGINEER (GEORGINA McDONALD, 313-967-5431). GIVE 5 WORKING DAYS NOTICE.

BOX SPAN CALCULATIONS
NOT TO SCALE



HAND DIG (14) STRAIN POLE, 30', STEEL, 6 BOLT
(15) STRAIN POLE FDN, 6 BOLT (42"Ø, 11.5')
POCH=22'-8" (SPAN #1)
POCH=23'-2" (SPAN #2)
SERIAL PORT PROTOCOL (SPP) RADIO (MOUNT AT 24')
(2) INSTALL HH & CONDUIT.



PRELIMINARY
PLANS SUBJECT TO CHANGE

SIGNALS	
OPENINGS:	26
CYCLIC WATTS:	290
STEADY WATTS:	0
PLAN:	82143-01-015

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE:)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

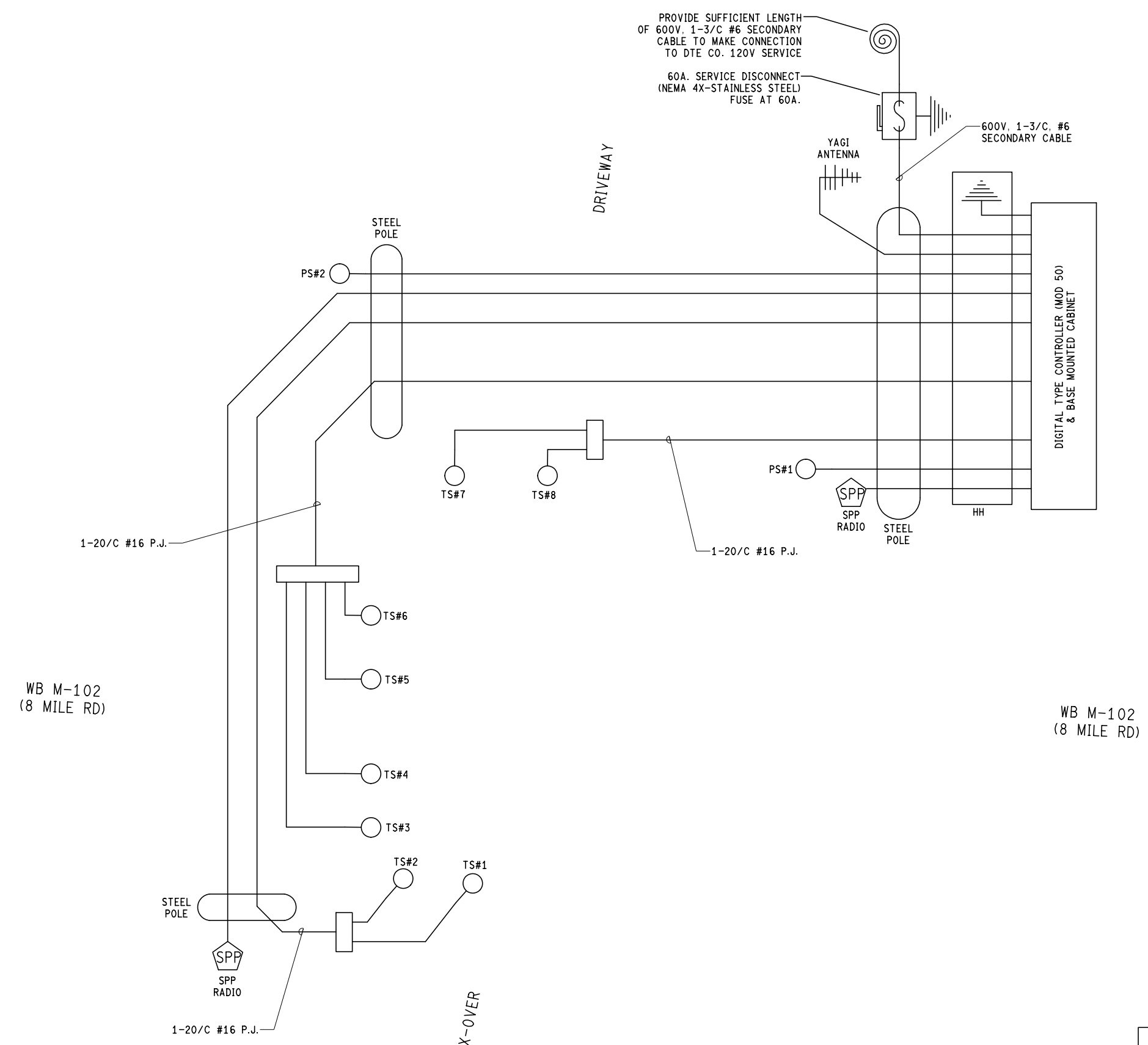


DATE: 10/28/2015
DESIGN UNIT:
TSC: DETROIT

CS: 82143
JN: PERMIT REF #33527

TRAFFIC SIGNAL INSTALLATION
WB M-102 @ X-OVER E OF FAIR STREET
CITY OF FERDALE; WAYNE CO.

DRAWING SHEET
M-102 SIGNAL 3 SECT 1 25



PROVIDE SUFFICIENT LENGTH OF 600V, 1-3/C #6 SECONDARY CABLE TO MAKE CONNECTION TO DTE CO. 120V SERVICE

60A. SERVICE DISCONNECT (NEMA 4X-STAINLESS STEEL) FUSE AT 60A.

600V, 1-3/C, #6 SECONDARY CABLE

WB M-102 (8 MILE RD)

WB M-102 (8 MILE RD)

CABLES TO BE USED UNLESS SPECIFIED OTHERWISE

1. TRAFFIC SIGNAL CABLES ARE 7/C#16 P.J.
2. PEDESTRIAN SIGNAL CABLES ARE 7/C#16 P.J.
3. YAGI ANTENNA CABLES ARE LMR 400 OR APPROVED EQUAL.
4. WIRELESS VEHICLE DETECTION RADIO CABLES ARE 600V CAT 5e OR APPROVED EQUAL.

CABLING DIAGRAM
NOT TO SCALE

PRELIMINARY
PLANS SUBJECT TO CHANGE

SIGNALS
OPENINGS:
CYCLIC WATTS:
STEADY WATTS:
PLAN: 82143-01-015

FINAL ROW PLAN REVISIONS				(SUBMITTAL DATE:)			
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION



FILE: PERMIT_8214301015_CON002.DGN	DATE: 10/28/2015	CS: 82143
TSC: DETROIT	DESIGN UNIT:	JN: PERMIT REF #33527

TRAFFIC SIGNAL CABLING		DRAWING	SHEET
WB M-102 @ X-OVER E OF FAIR STREET		M-102 SIGNAL	SECT 1
CITY OF FERDALE; WAYNE CO.		4	26

TRAFFIC SIGNAL TIMING PERMIT

APPROACH	PHASE	1	2	3	4	5	6	7	8						
			WB	NB	SB						TIMING INSTALLED				
MINIMUM GREEN			10	7	7						REMARKS				
PASSAGE			0.0	2.0	2.0						Signal Modernization to box span.				
MAXIMUM NO. 1			48	16	16						X-over and driveway approaches split phased.				
MAXIMUM NO. 2			0	0	0										
YELLOW CHANGE			3.9	3.0	3.0										
RED CLEARANCE			1.4	2.2	2.7										
WALK			7	0	0										
PEDESTRIAN CLEARANCE			12	0	0										
EXTENDED PED. CLEARANCE			0	0	0										
REST IN WALK			0	0	0										
INITIALIZATION			4	1	1										
NON-ACT RESPONSE			0	0	0										
VEHICLE RECALL			3	0	0										
PEDESTRIAN RECALL			2	0	0										
NON-LOCK MEMORY			0	0	0										
DUAL ENTRY			0	0	0										
		CYCLE								O1	O2	O3	PREPARED BY: JAM	DATE: 11/16/15	
DIAL 1	SPLIT 1	80	48	16	16					55			FLASH HOURS:		
DIAL 2	SPLIT 1												01:00	06:00	DAILY <input checked="" type="checkbox"/> NONE <input type="checkbox"/>
DIAL 3	SPLIT 1														
DIAL	SPLIT														
DIAL	SPLIT														
DIAL	SPLIT														
		MODE											NIGHT FLASH:		
													FY = M-102 WB	FR = All others	
													CONFLICT FLASH:		
													FY = M-102 WB	FR = All others	
													CONTROLLER TYPE:		
													<input checked="" type="checkbox"/> EPAC	PRE-EMPT <input type="checkbox"/>	
													<input type="checkbox"/> Other:	COUNTDOWN PEDS <input checked="" type="checkbox"/>	
													LOCATION:		
													M-102 (8 Mile) WB @ X-over E. of Fair St.		
													CITY/TWP: Detroit		
													COUNTY : Wayne		
													MILE POINT	CONTROL SECTION-SPOT #	
													0.51	82143-015	
													Job # (If Applicable): Permit 33527		

PHASE	D1/S1/O1 Normal	OVERLAPS							
		Overlap Phase	Load Bays	Phases Overlapped	T.G. (s)	Y (s)	R (s)	-GY	+GRN
1									
2 Westbound M-102 (8 Mile)		=							
3 Northbound X-over		=							
4 Southbound driveway		=							
5		=							
6		=							
7		=							
8		=							

CLEAR PAGE 1

CLEAR ALL

ADVANCED TIMING PARAMETERS FORM

SYSTEM INFORMATION	LEFT-TURN PHASING						RING AND BARRIER STRUCTURE													
Controller Type: <input checked="" type="checkbox"/> EPAC <input type="checkbox"/> Other:	Phase # / Description	Permissive-Protected		Protected-Only		R1	B1			B2			B3			B4				
		Lead	Lag	Split	Lead		Lag	2			3	4								
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>													
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	R2												
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	R3												
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R4														
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>															
System Type: <input checked="" type="checkbox"/> Closed Loop <input type="checkbox"/> Stand By <input type="checkbox"/> Group 1 <input type="checkbox"/> Group 2 Address: <input type="checkbox"/> TBC <input type="checkbox"/> TBC/GPS <input type="checkbox"/> None <input type="checkbox"/> Other: If TBC, Synch by: <input type="checkbox"/> TOD <input type="checkbox"/> Event Interconnect Type: <input type="checkbox"/> Hardwire <input type="checkbox"/> Fiber-Optic <input checked="" type="checkbox"/> Radio <input type="checkbox"/> Phone Drop <input type="checkbox"/> None <input type="checkbox"/> Other: If Phone Drop, Phone # Controller Status: <input type="checkbox"/> Master <input checked="" type="checkbox"/> Slave <input type="checkbox"/> Isolated <input type="checkbox"/> TBC If Slave, Master Location: I-75 S.D. @ M-102 Master Spot # : 82252-01-001	VEHICULAR AND PEDESTRIAN DETECTION												DISAPPEARING LEGEND CASE SIGNS							
	Approach		Vehicular Detection						Pedestrian Detection											
			Movements and Call Delay (s)			Type			Push-Button Crossing Locations											
			Left	Thru	Right	Loop	Video	Other												
	NB x-over		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>												
	SB Driveway		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> 10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>												
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>												
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>												
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>												
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>												
ADDITIONAL DIAL SPLIT DATA												COORDINATION DATA								
		PHASE	1	2	3	4	5	6	7	8	O1	O2	O3	Operation Mode	1					
DIAL	SPLIT	CYCLE												Coordination Mode	0					
DIAL	SPLIT	CYCLE												Maximum Mode	0					
DIAL	SPLIT	CYCLE												Correction Mode	2					
DIAL	SPLIT	CYCLE												Offset Mode	0					
DIAL	SPLIT	CYCLE												Force Mode	0					
DIAL	SPLIT	CYCLE												Max Dwell	0					
DIAL	SPLIT	CYCLE												Yield Period	0					
REMARKS:							ADDITIONAL OVERLAP DATA													
							Overlap Phase							Load Bays	Phases Overlapped	T.G. (s)	Y (s)	R (s)	-G/Y	+GRN
							=													
							=													
							=													
							PREPARED BY: JAM					DATE: 11/16/15					LOCATION:			
							<input checked="" type="checkbox"/> MDOT					<input type="checkbox"/> County					<input type="checkbox"/> City			
							<input type="checkbox"/> Consultant										CONTROL SECTION-SPOT #			
																	82143-015			

CLEAR PAGE 2

PREEMPTION INFORMATION FORM

Preemption Description:																			
Preempt # =	Time (s)	Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
SEL Ped Cl		Vehicle	Track																
SEL Yellow			Dwell																
SEL Red Cl			Cycle																
TRACK Green		Ped	Exit																
TRACK Ped Cl			Track																
TRACK Yellow			Dwell																
TRACK Red CL			Cycle																
DWELL Green		Overlap Vehicle	Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
RET Ped Cl			Track																
RET Yellow			Dwell																
RET Red Cl			Cycle																

Preemption Description:																			
Preempt # =	Time (s)	Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
SEL Ped Cl		Vehicle	Track																
SEL Yellow			Dwell																
SEL Red Cl			Cycle																
TRACK Green		Ped	Exit																
TRACK Ped Cl			Track																
TRACK Yellow			Dwell																
TRACK Red CL			Cycle																
DWELL Green		Overlap Vehicle	Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
RET Ped Cl			Track																
RET Yellow			Dwell																
RET Red Cl			Cycle																

Preemption Description:																			
Preempt # =	Time (s)	Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
SEL Ped Cl		Vehicle	Track																
SEL Yellow			Dwell																
SEL Red Cl			Cycle																
TRACK Green		Ped	Exit																
TRACK Ped Cl			Track																
TRACK Yellow			Dwell																
TRACK Red CL			Cycle																
DWELL Green		Overlap Vehicle	Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
RET Ped Cl			Track																
RET Yellow			Dwell																
RET Red Cl			Cycle																

Preemption Description:																			
Preempt # =	Time (s)	Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
SEL Ped Cl		Vehicle	Track																
SEL Yellow			Dwell																
SEL Red Cl			Cycle																
TRACK Green		Ped	Exit																
TRACK Ped Cl			Track																
TRACK Yellow			Dwell																
TRACK Red CL			Cycle																
DWELL Green		Overlap Vehicle	Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
RET Ped Cl			Track																
RET Yellow			Dwell																
RET Red Cl			Cycle																

Preempt System Data						
Ring	1	2	3	4		
MIN GRN/WLK (s)						
Priority	PE/FL	PE1/2	PE2/3	PE3/4	PE4/5	PE5/6
Status						

REMARKS :

PREPARED BY: JAM DATE: 11/16/15

LOCATION:
M-102 (8 Mile) WB @ X-over E. of Fair St.

CONTROL SECTION-SPOT #
82143-015

Intersection 2

Woodward Ave Srv Rd (NB) & E 8 Mile Srv Rd (WB)

Signalized

Woodward Ave Srv Rd (NB)

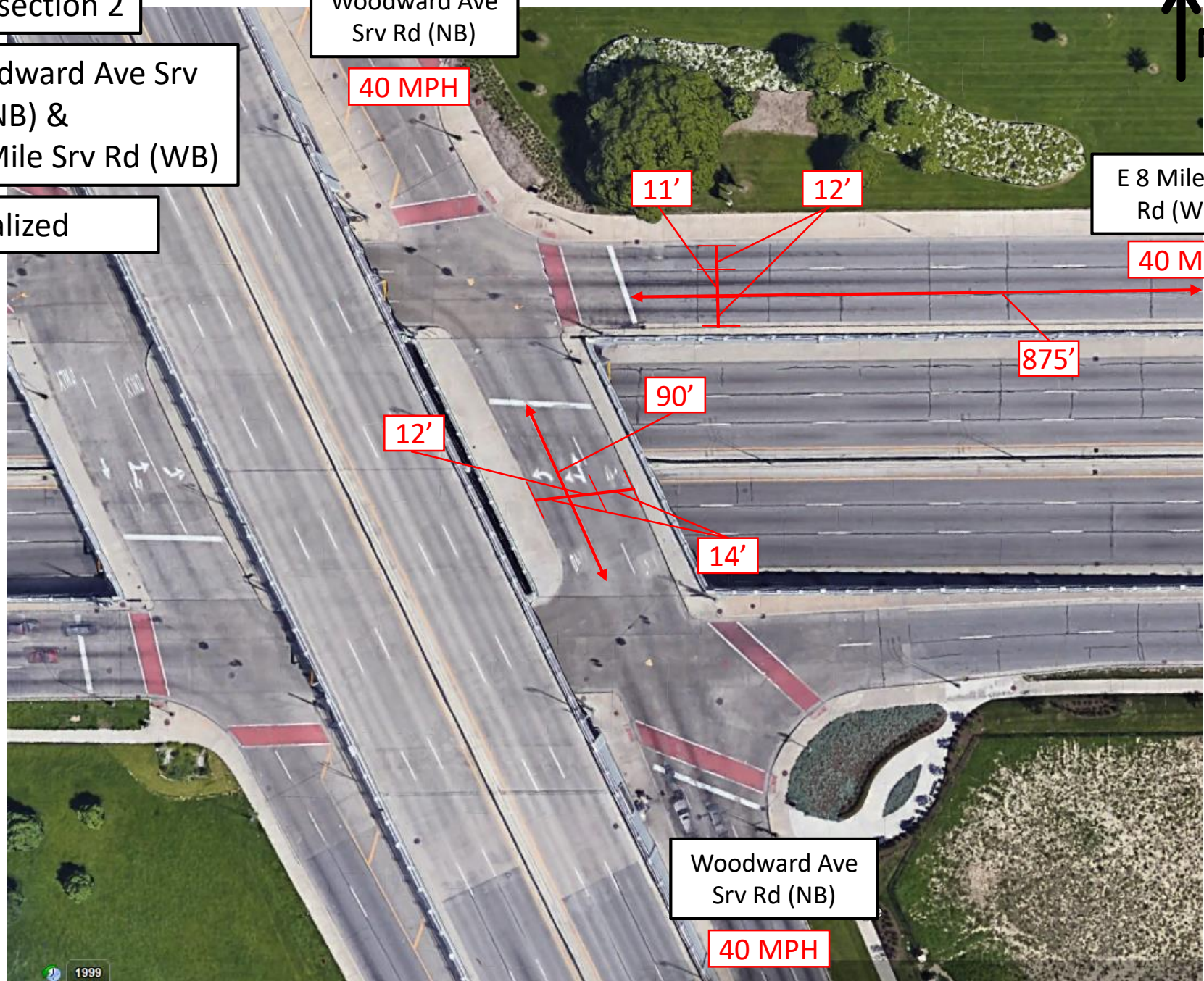
40 MPH

E 8 Mile Srv Rd (WB)

40 MPH

Woodward Ave Srv Rd (NB)

40 MPH



12'

11'

12'

90'

14'

875'

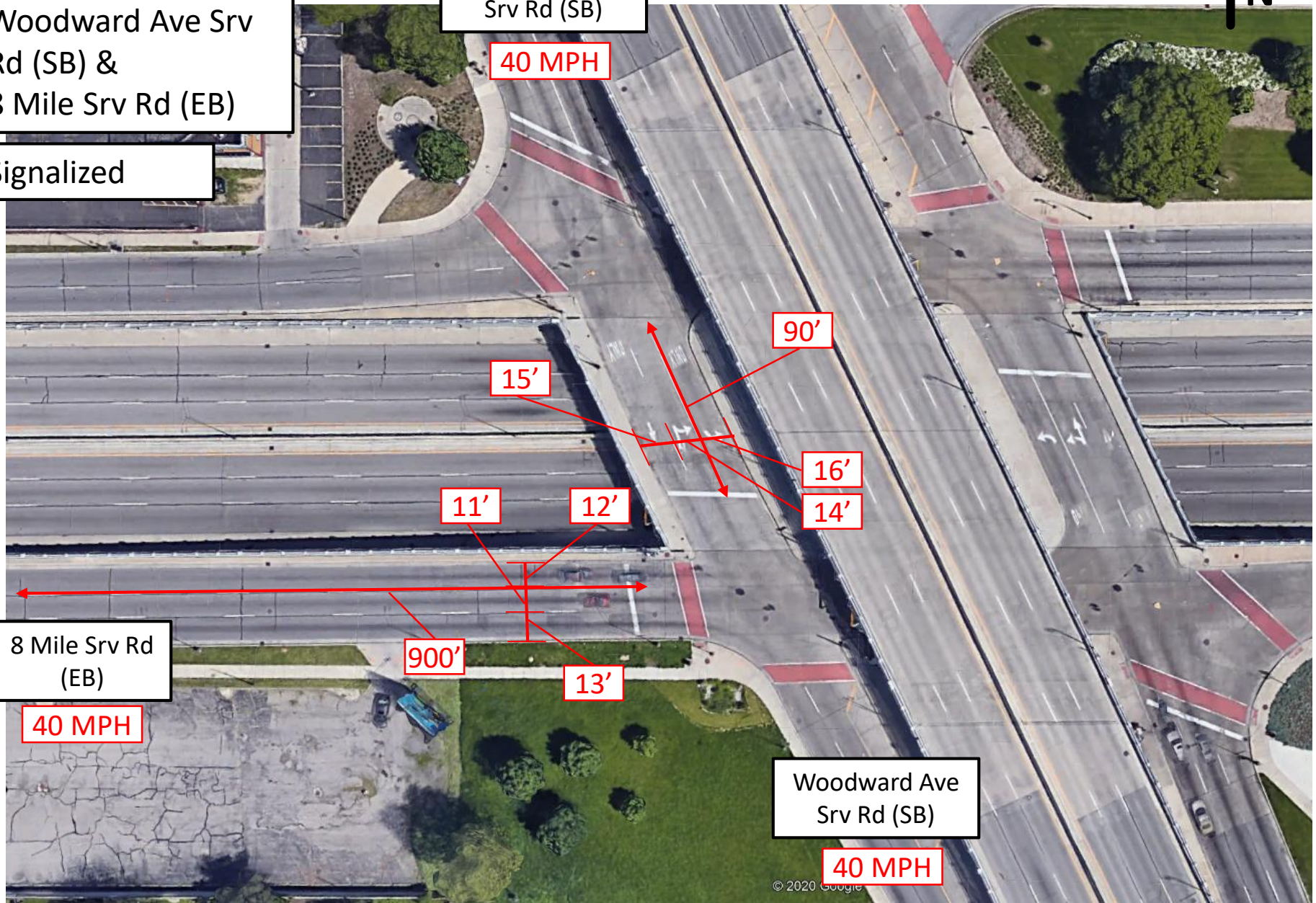
Intersection 3

Woodward Ave Srv Rd (SB) & 8 Mile Srv Rd (EB)

Signalized

Woodward Ave Srv Rd (SB)

40 MPH



8 Mile Srv Rd (EB)

40 MPH

Woodward Ave Srv Rd (SB)

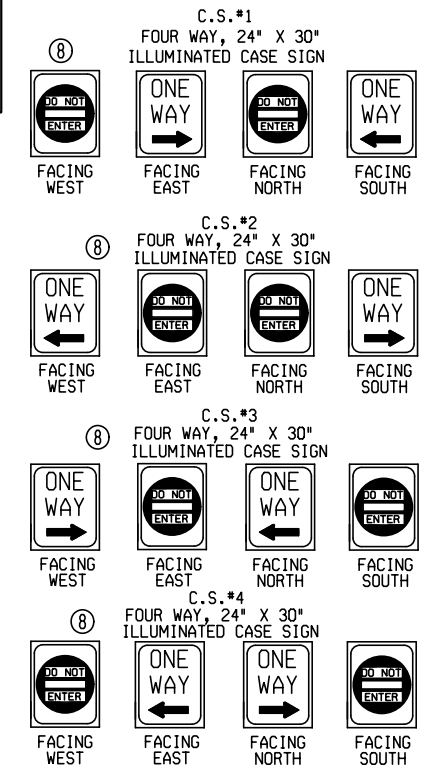
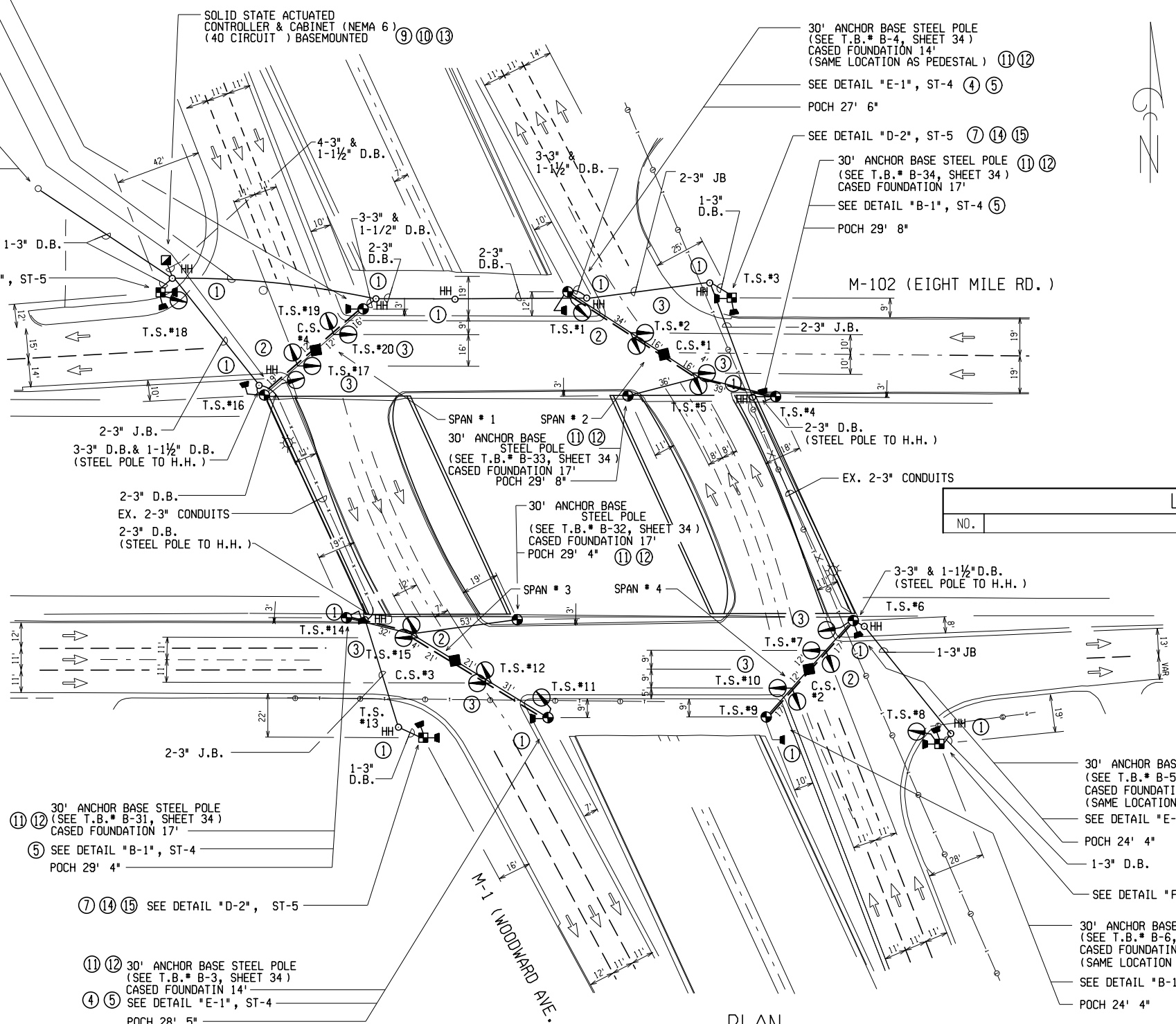
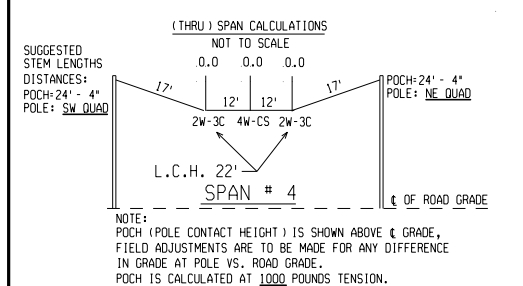
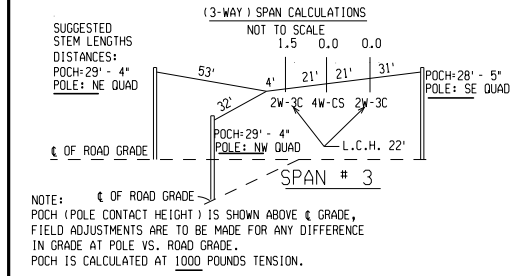
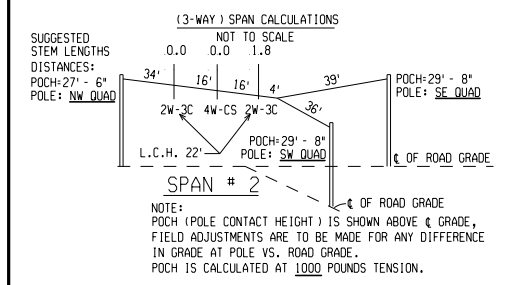
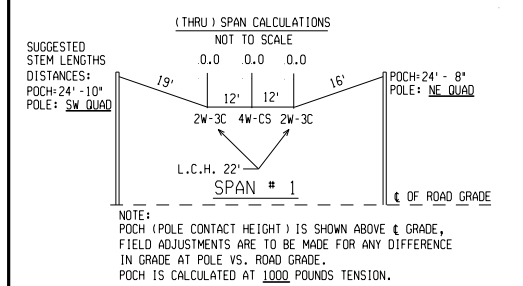
40 MPH

- ⑪ ⑫ 30' ANCHOR BASE STEEL POLE (SEE T.B.# B-1, SHEET 34) CASED FOUNDATION 14'
- ⑤ SEE DETAIL "B-1", ST-4 POCH 24' 8"
- 2-3" JACKED-BORED
- ⑪ ⑫ 30' ANCHOR BASE STEEL POLE (SEE T.B.# B-2, SHEET 34) CASED FOUNDATION 17'
- ④ ⑤ SEE DETAIL "E-1", ST-4 POCH 24' 10"
- EXIST. WOOD POLE
- ⑰ FIT UP WOOD POLE AS A SECONDARY CABLE POLE
- ⑱ INSTALL 60A. SERVICE DISCONNECT (NEMA 4X-STAINLESS STEEL) FUSED AT 60A.

UTILIZE EXISTING CONDUIT & HANDHOLES WHERE POSSIBLE, OTHERWISE INSTALL NEW AS DIRECTED BY ENGINEER.

FOR ELECTRICAL SERVICE INSPECTION CONTACT THE MICHIGAN DEPARTMENT OF CONSUMER INDUSTRY & SERVICES AT COST TO CONTRACTOR WILL BE \$50.00.

CONTACT: MR. LARRY JONES, DE.CO. AT (313) 235-2055 FOR ELECTRIC SERVICE NO COST TO CONTRACTOR

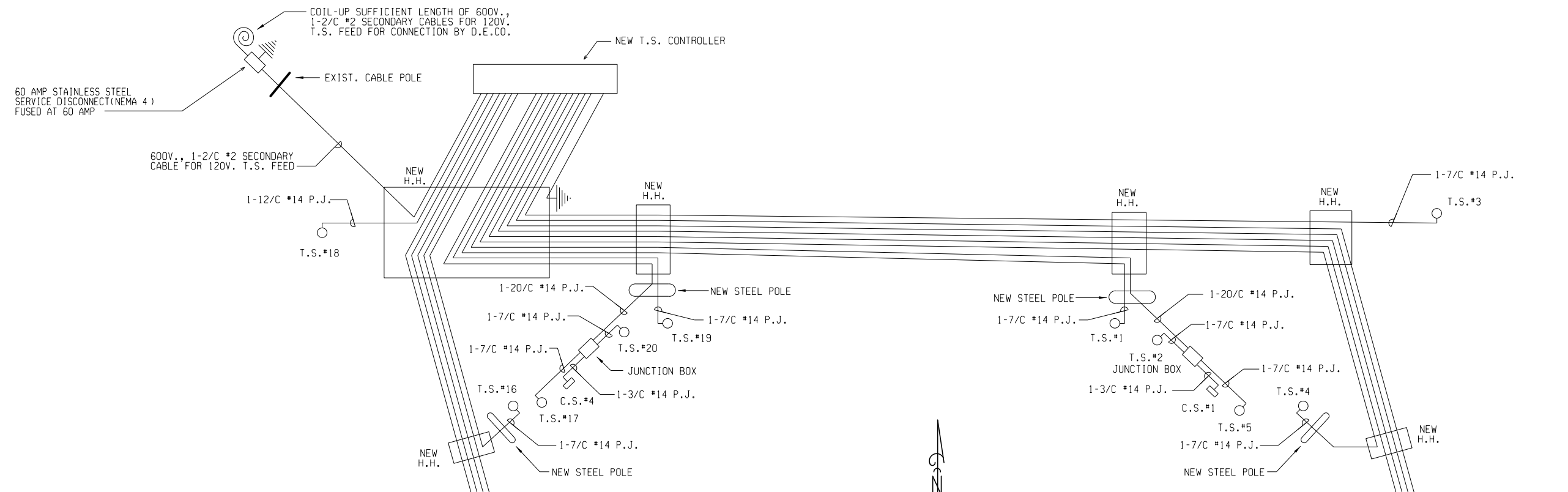


LIST OF MATERIAL			
NO.	ITEM	QUANTITIES	ITEM CODE
SEE SHEET # 7			

NORTH BOUND T.S.#2 & T.S.#5 AND SOUTH BOUND T.S.#12 & T.S.#15 SHALL BE "PROGRAMABLE HEAD" TYPE SIGNALS. THIS SHALL BE INCLUDED IN "TS, 2 Way Span Wire Mtd" AND NOT PAID SEPARATELY.

 CONSUMER TOWNSHIP ENVIRONMENTAL ENGINEERS OF MICHIGAN, INC. 822 CENTENNIAL WAY LANSING, MICHIGAN 48917 (517) 323-8200	CONTROL SECTION	JOB NUMBER	FEDERAL NUMBERS		 MICHIGAN DEPARTMENT OF TRANSPORTATION	AUTH. NO.	DRAWN	WLW	M-102 (EIGHT MILE RD.) AT	CONST
	CS 82143	JN 77901A	PROJECT	ITEM		CONTR. SEC. 82143	DATE 6-4-04	SCALE 1"=30'	CITIES OF FERNDALE & DETROIT	SHEET NO.
						ENGR/TECH WENTWORTH	SCALE 1"=30'	PLAN 82143-01-001	OAKLAND & WAYNE COUNTIES	
						SHEET 6 OF 57				

MDOT # 82143-01-001 CTE # 8264 C CYCLIC WATTS 13,100 STEADY WATTS 1200

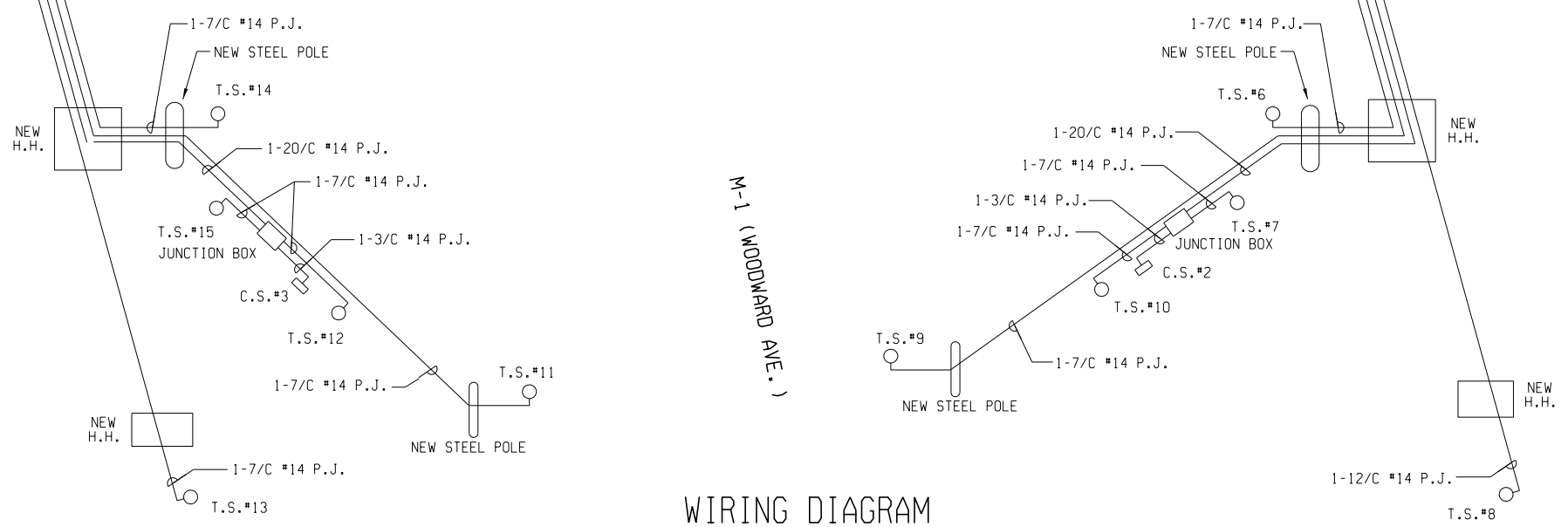


M-102 (EIGHT MILE RD.)

M-1 (WOODWARD AVE.)

WIRING DIAGRAM
NOT TO SCALE

LIST OF MATERIAL			
NO.	ITEM	QUANTITIES	ITEM CODE
①	Hh, Round	11 Ea	8190260
②	Span Wire	4 Ea	8200140
③	TS, Two Way Span Wire Mtd	8 Ea	8200200
④	TS, One Way Bracket Arm Mtd	4 Ea	8200220
⑤	TS, Pedestrian, One Way Bracket Arm Mtd	8 Ea	8200225
⑥	TS, One Way Pedestal Mtd	2 Ea	8200230
⑦	TS, Pedestrian, Two Way Pedestal Mtd	4 Ea	8200237
⑧	Case Sign, Four Way, 24 inch by 30 inch	4 Ea	8200013
⑨	Controller and Cabinet, Solid State, TBC, Delivered	1 Ea	8200041
⑩	Controller and Cabinet, Solid State, TBC	1 Ea	8200040
⑪	Strain Pole, Steel, Anchor Base, 30 feet	10 Ea	8200155
⑫	Strain Pole Fdn, Cased	158 Ft	8200150
⑬	Controller Fnd, Base Mount	1 Ea	8200045
⑭	Pedestal, Alum	4 Ea	8200100
⑮	Pedestal, Fdn	4 Ea	8200105
⑯	Serv Disconnect	1 Ea	8200135
⑰	Wood Pole, Fit Up, Sec Cable Pole	1 Ea	8190495
○	Sec Cable, 600V, 1, 2/C*2	270 Ft	8190392
○	Conduit, DB, 1, 1 1/2 inch	40 Ft	8190027
○	Conduit, DB, 1, 3 inch	150 Ft	8190029
○	Conduit, DB, 2, 3 inch	150 Ft	8190032
○	Conduit, DB, 3, 3 inch	30 Ft	8190035
○	Conduit, DB, 4, 3 inch	20 Ft	8197001
○	Conduit, Jacked Bored	500 Ft	8190135
○	Sidewalk, Rem	3 Syd	2040013
○	Sidewalk, Conc, 4 inch	50 Sft	8030002



MDOT # 82143-01-001 CTE # 8264 D CYCLIC WATTS
STEADY WATTS

 <small>CONSULTING ENGINEERS OF MICHIGAN, INC.</small> <small>822 CENTRAL WAY LANSING, MICHIGAN 48917 (517) 323-8200</small>	CONTROL SECTION	JOB NUMBER	FEDERAL NUMBERS		 <small>Michigan Department of Transportation</small>	AUTH. NO.	DRAWN	DATE	M-102 (EIGHT MILE RD.) AT M-1 (WOODWARD AVE.) CITIES OF FERRISDALE & DETROIT OAKLAND & WAYNE COUNTIES	CONST SHEET NO.
	CS 82143	JN 77901A	PROJECT	ITEM		CONT. SEC. 82143 ENGR/TECH WENTWORTH SHEET 7 OF 57	WLW 6-4-04 SCALE 1"=30' PLAN 82143-01-001			

NTCIP TRAFFIC SIGNAL TIMING PERMIT

APPROACH	PHASE	1	2	3	4	5	6	7	8	TIMING INSTALLED	PRE-EMPT COUNTDOWN PEDS <input type="checkbox"/>	
MINIMUM GREEN		10	10	10	10	10	10	10	10	REMARKS New controller and cabinet replacement for connected vehicle application. Updated clearance intervals and ped times. Independent Ring Group: Ring 3 & 4 Group Offset Displacement 40s. LS#9-12 phase 1, 3, 5 & 7 peds (see sheet 4)	<input type="checkbox"/>	
PASSAGE / EXTEND1		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
MAXIMUM GREEN NO. 1		18	50	51	17	18	50	50	18			
MAXIMUM GREEN NO. 2		0	0	0	0	0	0	0	0			
YELLOW CLEARANCE		3.9	3.9	3.9	3.9	3.6	3.9	3.6	3.9			
ALL RED CLEARANCE		1.8	1.5	1.6	1.8	2.1	1.7	1.9	1.9			
WALK		7	7	7	7	7	7	7	7			
FLASHING DON'T WALK (FDW) CLEARANCE		14	14	9	8	13	13	8	9			
EXT PED CLR (EOG, EOY, 3.0s)		3.0s	3.0s	3.0s	3.0s	3.0s	3.0s	3.0s	3.0s			
WALK REST MODIFIER (Y, N)		N	N	N	N	N	N	N	N			
START UP STATE (G/W, R, G, Y)		G/W		G/W			G/W	G/W				
VEHICLE RECALL (NONE, MIN, MAX, SOFT)		MAX	MAX	MAX	MAX	MAX	MAX	MAX	MAX			
PEDESTRIAN RECALL (NONE, RECL, OTHR)		RECL	RECL	RECL	RECL	RECL	RECL	RECL	RECL			
DUAL ENTRY (Y, N)		N	N	N	N	N	N	N	N			
MODE (CRD, MIN, MAX, NOCRD)		CRD	CRD	CRD	CRD	CRD	CRD	CRD	CRD			
DAILY FLASH (Y, R, DK, NA)		NA	NA	NA	NA	NA	NA	NA	NA			
CONFLICT FLASH (Y, R, DK)		R	R	R	R	R	R	R	R			
EVNT/ACTN PLN 1	OFFSET 0	CYCLE 80	24	56	57	23	24	56	56	24		
EVNT/ACTN PLN	OFFSET	CYCLE										
EVNT/ACTN PLN	OFFSET	CYCLE										
EVNT/ACTN PLN	OFFSET	CYCLE										
EVNT/ACTN PLN	OFFSET	CYCLE										
EVNT/ACTN PLN	OFFSET	CYCLE										

Hours of Operation
Event/Action Plan 1 - Normal

FLASH HOURS:
 to DAILY NONE
 to

PHASE	VEHICLE OVERLAPS									
	Overlap Phase	Load Bay	Phases Overlapped	T.G. (s)	Y (s)	R (s)	FYA Phases Perm	Prot	Flash Daily	Confl
1 NB M-1 (Woodward) Near	=									
2 EB 8 Mile Far	=									
3 NB M-1 (Woodward) Far	=									
4 WB 8 Mile Near	=									
5 SB M-1 (Woodward) Near	=									
6 WB 8 Mile Far	=									
7 SB M-1 (Woodward) Far	=									
8 EB 8 Mile Near	=									

CONTROLLER and FIRMWARE#
 Siemens (SEPAK)
 ECONOLITE (EOS)
 Other:

PREPARED BY:
CJS
DATE: 03/06/20

LOCATION:
M-102 (8 Mile) @ M-1 (Woodward)
CITY/TWP: Detroit
COUNTY : Wayne

MILE POINT 0.17	CONTROL SECTION-SPOT # 82143-01-001
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Job # (If Applicable): 133164

CLEAR ALL

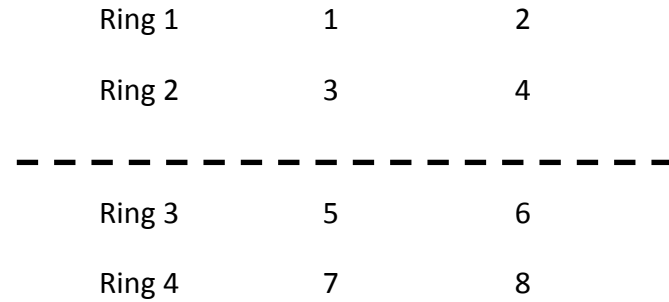
ADVANCED TIMING PARAMETERS FORM

SYSTEM INFORMATION System Type: <input checked="" type="checkbox"/> Central Group ID <input type="checkbox"/> TBC <input type="checkbox"/> None <input type="checkbox"/> Other: Location ID: Interconnect: <input type="checkbox"/> HARDWIRE <input type="checkbox"/> FIBER-OPTIC <input type="checkbox"/> RADIO <input type="checkbox"/> SERIAL RADIO <input type="checkbox"/> IP RADIO <input type="checkbox"/> TBC <input type="checkbox"/> GPS CLOCK <input checked="" type="checkbox"/> CELL MODEM <input type="checkbox"/> NONE <input type="checkbox"/> Other:	LEFT-TURN PHASING						RING AND BARRIER STRUCTURE																	
	Phase # / Description	Permissive-Protected			Protected-Only			R1	B1			B2			B3			B4						
		Lead	Lag	Split	Lead	Lag	R2		1	2	3	4	5	6	7	8	9	10	11	12				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R2	3	4	5	6	7	8	9	10	11	12	13	14					
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R3	5	6	7	8	9	10	11	12	13	14	15	16					
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R4	7	8	9	10	11	12	13	14	15	16	17	18					
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																		
VEHICULAR AND PEDESTRIAN DETECTION												COORDINATION/OPERATION SETTINGS												
Approach	Vehicle Detection						Pedestrian Detection						CHANGE (ADD ONLY, ADD/SUBT, OTHR)						SMOOTH					
	Movements and Call Delay (s)						Locking						Push-Button Crossing Locations											
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right			
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
ADDITIONAL EVENT/ACTION PLAN DATA												DISAPPEARING CASE SIGN												
PHASE			1	2	3	4	5	6	7	8	DISAPPEARING CASE SIGN													
EVNT/ACTN PLN	OFFSET	CYCLE										DISAPPEARING CASE SIGN												
EVNT/ACTN PLN	OFFSET	CYCLE																						
EVNT/ACTN PLN	OFFSET	CYCLE																						
EVNT/ACTN PLN	OFFSET	CYCLE																						
EVNT/ACTN PLN	OFFSET	CYCLE																						
EVNT/ACTN PLN	OFFSET	CYCLE																						
EVNT/ACTN PLN	OFFSET	CYCLE																						
EVNT/ACTN PLN	OFFSET	CYCLE																						
EVNT/ACTN PLN	OFFSET	CYCLE																						
EVNT/ACTN PLN	OFFSET	CYCLE																						
REMARKS												PREPARED BY: CJS DATE: 03/06/20 <input type="checkbox"/> MDOT <input type="checkbox"/> County <input type="checkbox"/> City <input type="checkbox"/> Consultant LOCATION: M-102 (8 Mile) @ M-1 (Woodward) CONTROL SECTION-SPOT # 82143-01-001												

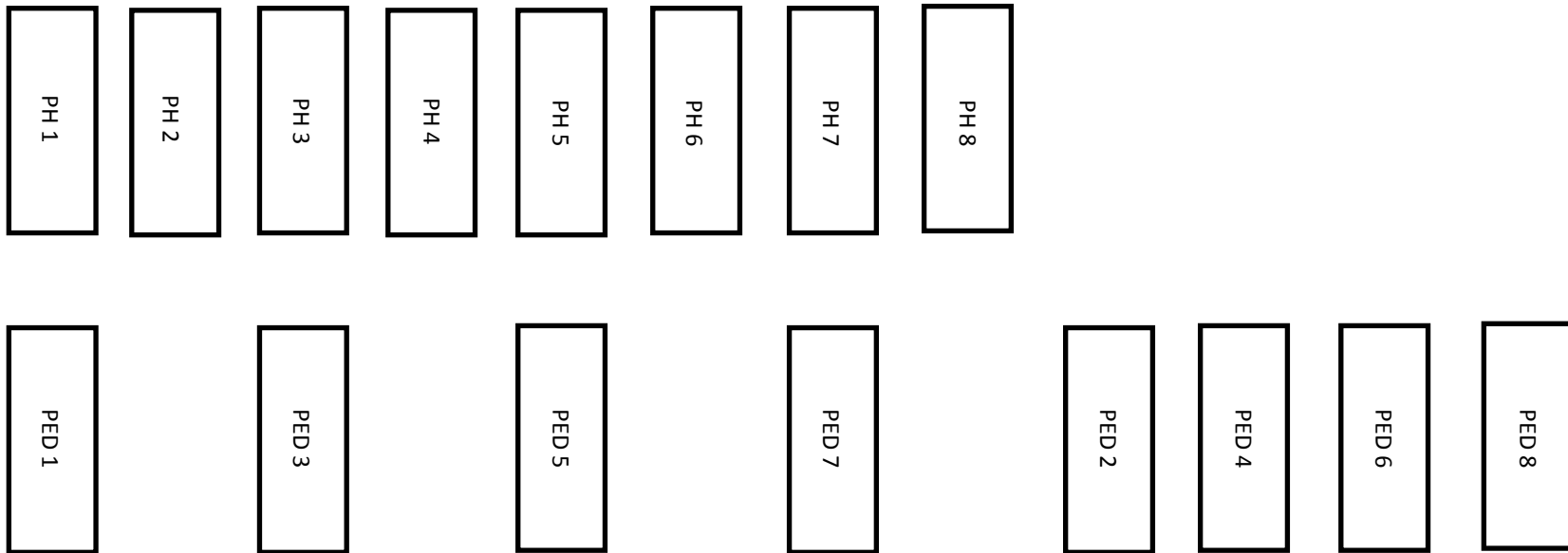
SCHEDULING INFORMATION

Schedule #	Days of Week	Start Date	End Date	Day Plan #	Events
1	Sunday-Saturday	January 1	December 31	1	#1 - Normal
<i>Example Values</i>					
1	Saturday and Sunday	January 1st	December 31st	1	#1 - Normal #4 - 23:00 - 06:00
2	Monday - Friday	January 1st	December 31st	2	#1 - Normal #2 - AM Peak 06:00 - 09:00 #3 - PM Peak 14:00 - 18:00
					PREPARED BY: CJS DATE: 03/06/20 LOCATION: M-102 (8 Mile) @ M-1 (Woodward) CONTROL SECTION-SPOT # 82143-01-001

PH1	NB Woodward Near (EPIC LD SW 1)
PH2	EB 8 Mile Far (EPIC LD SW 6)
PH3	NB Woodward Far (EPIC LD SW 2)
PH4	WB 8 Mile Near (EPIC LD SW 7)
PH5	SB Woodward Near (EPIC LD 3)
PH6	WB 8 Mile Far (EPIC LD SW 8)
PH7	SB Woodward Far (EPIC LD SW 4)
PH8	EB Eight Mile Near (EPIV LD SW 5)



Note: There are no barriers in the ring structure above. Each phase pair within the same ring is its own separate intersection. Note, we have to now assign 4 more pedestrian phases. If we are going to make this a NEMA controller each phase has to have its own Ped phase. Because rings 3 and 4 will adjust with relationship to rings 1 and 2 when it needs to get in step the pedestrian timing can not be tied down to just one load switch as was the case with the interval based EPIC Controller.



Intersection 4

Woodward Ave (NB)
& Site Driveway B

Signalized

Woodward Ave

40 MPH



Site Driveway B

25 MPH*

11'

33'

37'

12'

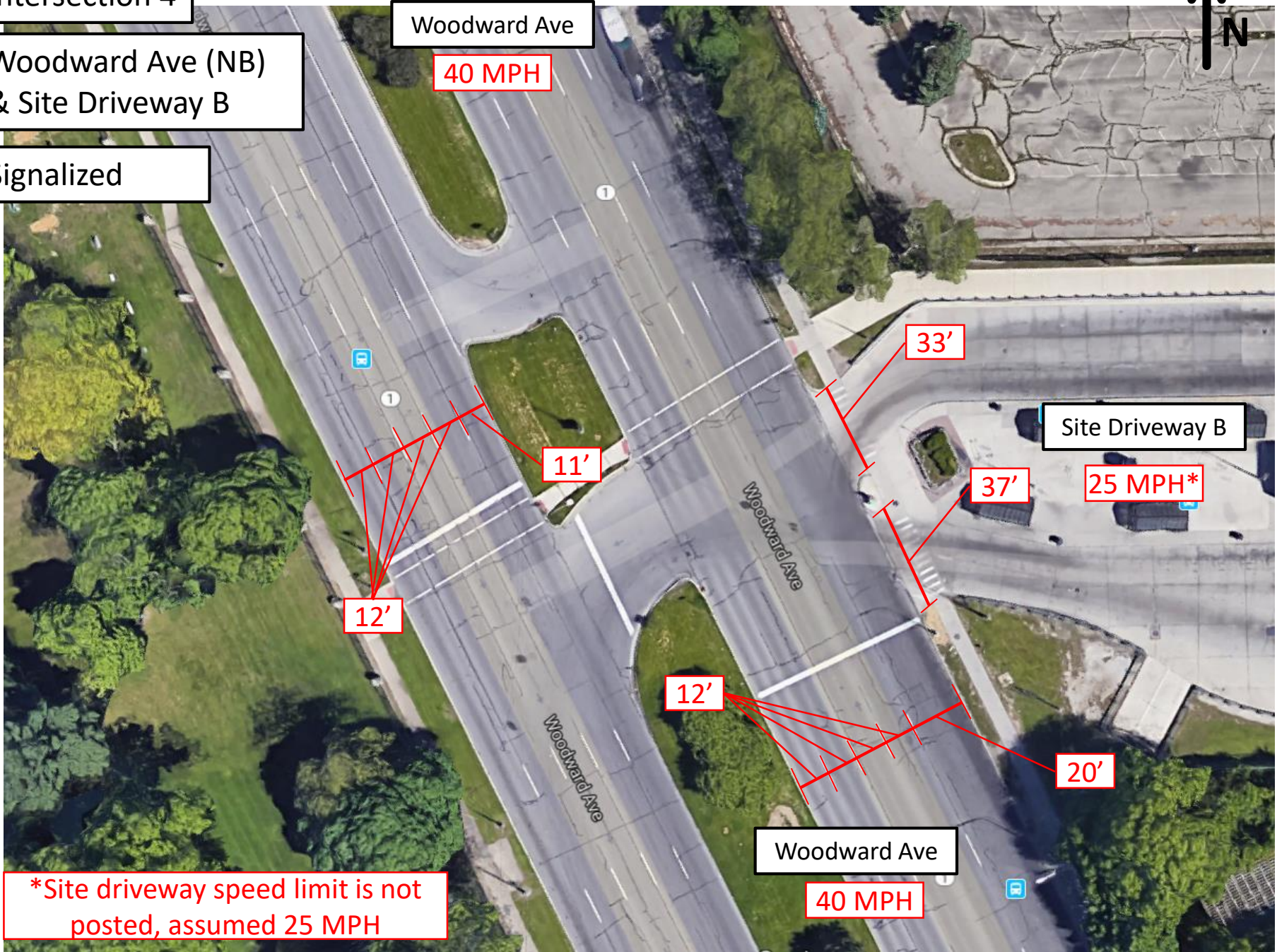
12'

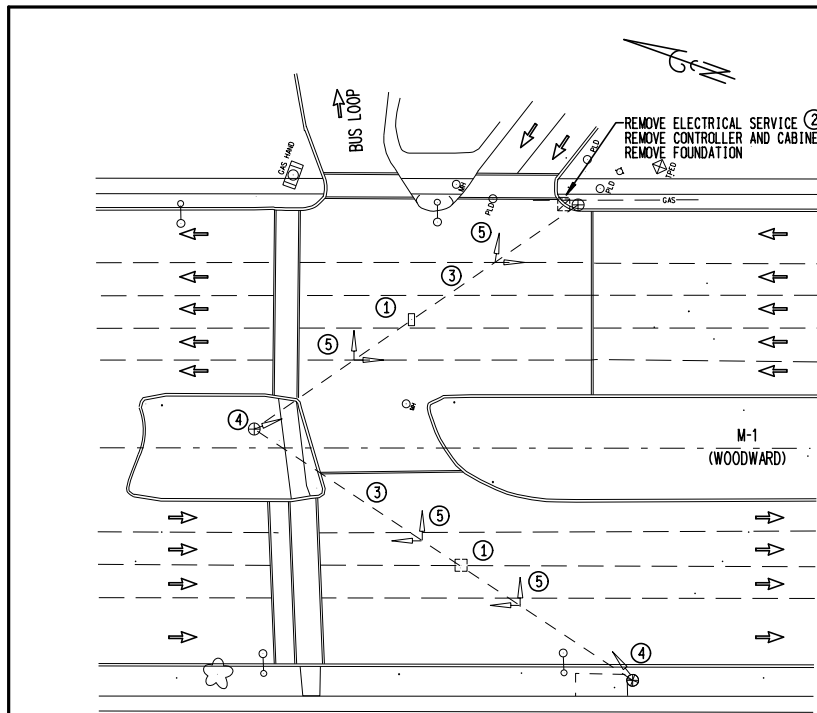
20'

Woodward Ave

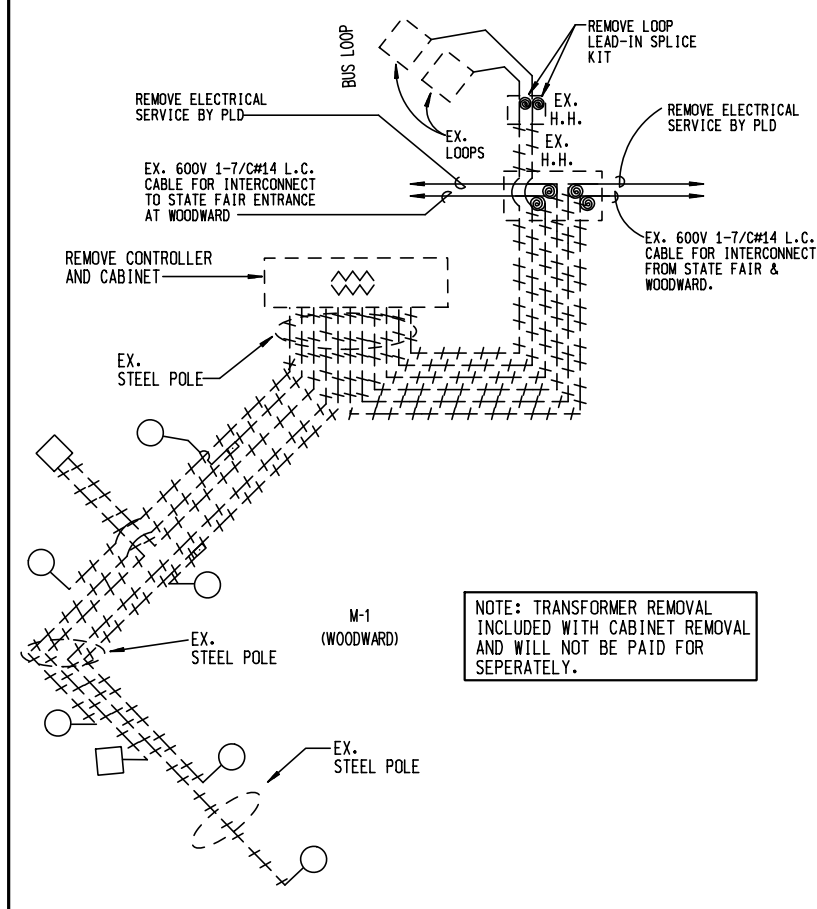
40 MPH

*Site driveway speed limit is not posted, assumed 25 MPH

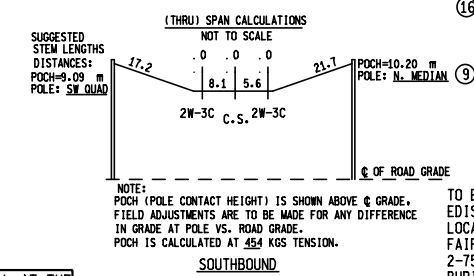
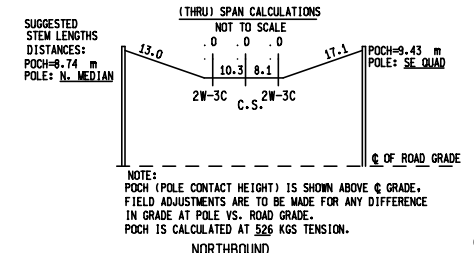




REMOVAL DIAGRAM NOT TO SCALE



REMOVAL WIRING DIAGRAM NOT TO SCALE



CONTACT JUBI CHACKUNKAL AT THE CITY OF DETROIT TRAFFIC ENGINEERING (313) 267-7231 FOR STREET NAME SIGN REMOVAL.

CONTACT: DETROIT EDISON: LARRY JONES, (313) 235-2055 72 HOURS IN ADVANCE OF POWER ACTIVATION. NO COST TO CONTRACTOR. (SEE SHEET 16 FOR POWER)

FOR ELECTRICAL SERVICE INSPECTION CONTACT THE MICHIGAN DEPARTMENT OF LABOR AT 517-241-9320 COST TO CONTRACTOR WILL BE \$40.00.

CERTAIN PLD OWNED FACILITIES DEPICTED ON THESE PLANS MAY HAVE BEEN REMOVED OR RELOCATED IN CONJUNCTION WITH PROPOSED OR ACTUAL PLD IMPROVEMENTS.

NOTE: SPLIT WIRE TRAFFIC HEADS FOR INTERNAL CLEARANCE

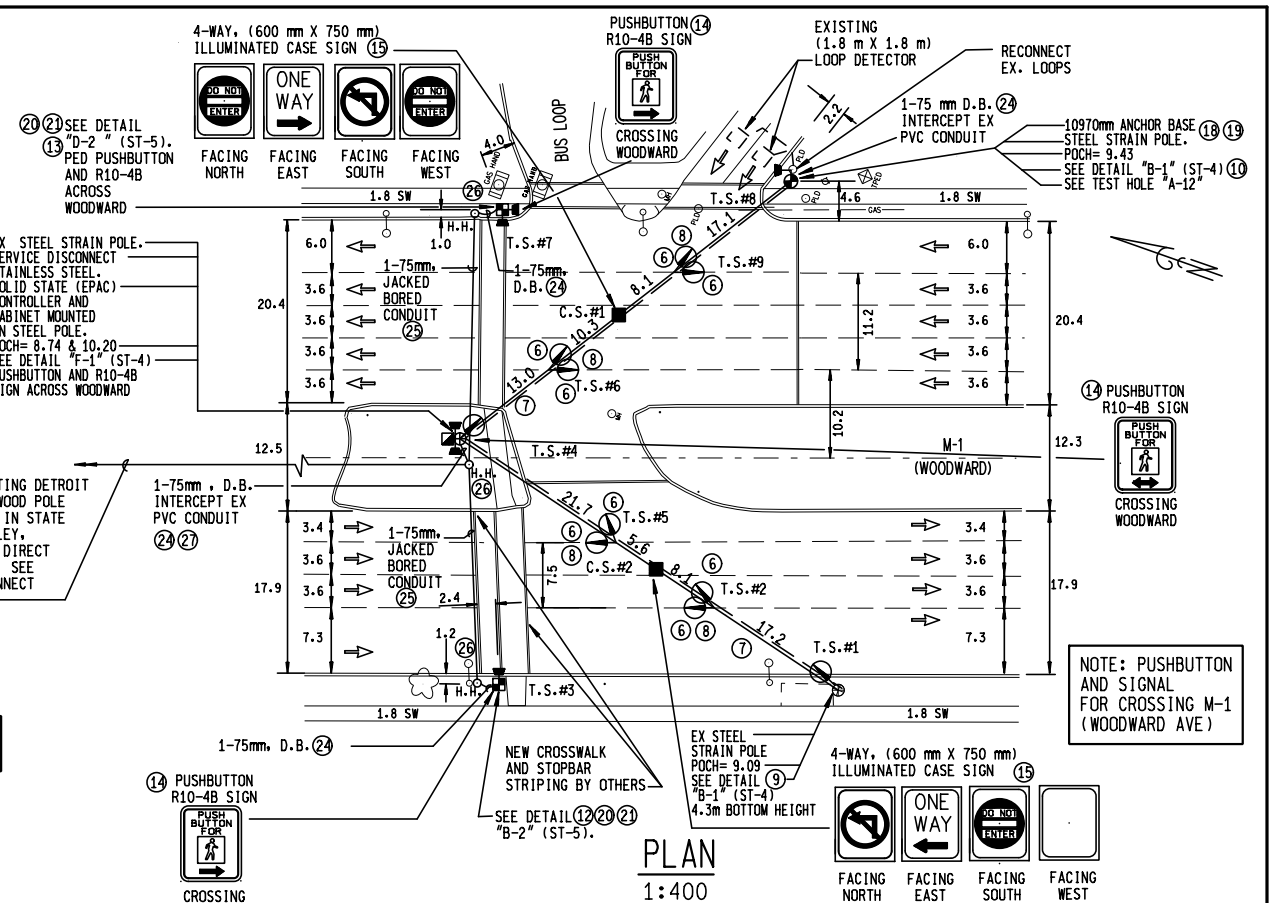
HAND DIG ENTIRE DEPTH OF ALL FOUNDATIONS

CAUTION: HIGH VOLTAGE & FIBER OPTIC CABLES MAY EXIST

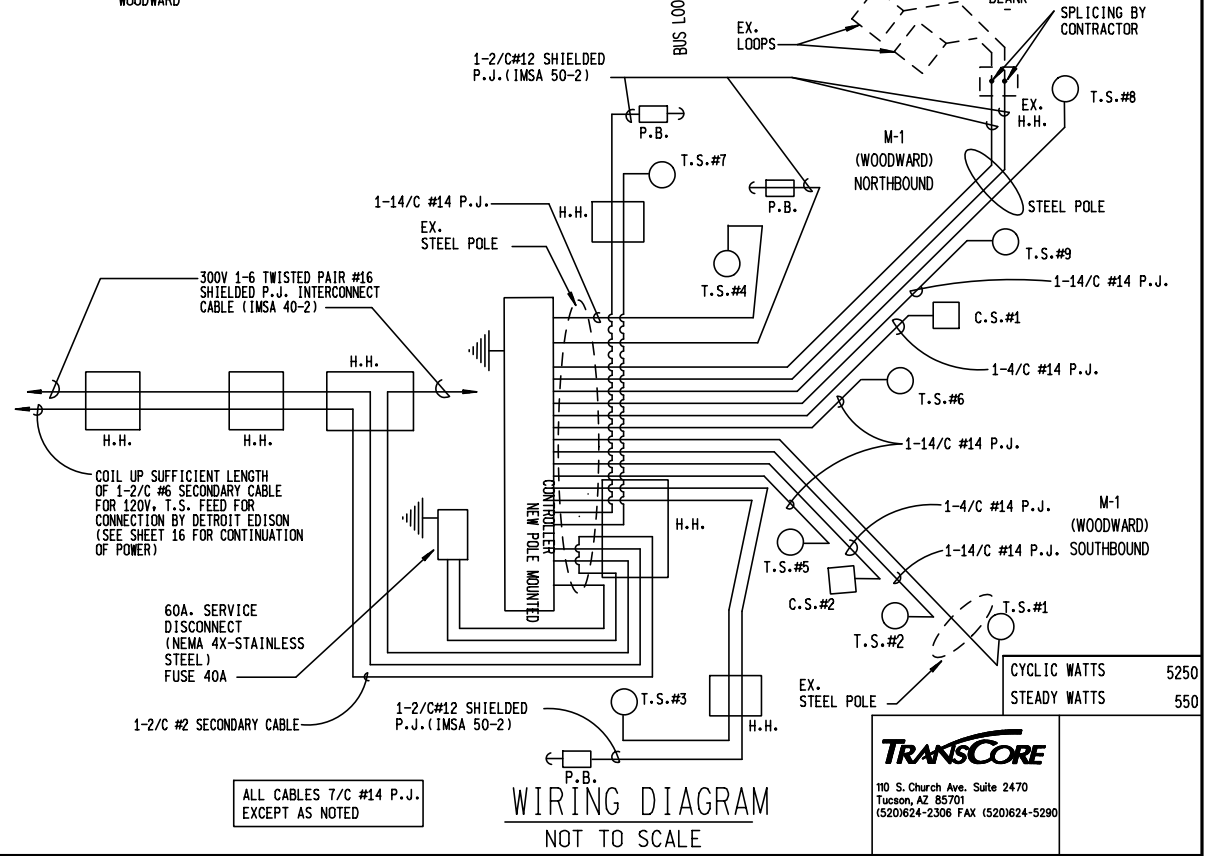
CONTACT: CITY OF DETROIT PUBLIC LIGHTING: KRIS ANALIL 313-267-7231 72 HOURS IN ADVANCE FOR REMOVAL OF INTERCONNECT AND ELECTRIC SERVICE.

LIST OF MATERIAL			
NO.	ITEM	QUANTITIES	ITEM CODE
1	Case Sign, Rem	2 Ea.	8200014
2	Controller and Cabinet, Rem	1 Ea.	8200017
3	Span Wire, Rem	2 Ea.	8200050
4	TS, Bracket Arm Mtd, Rem	2 Ea.	8200065
5	TS, Span Wire Mtd, Rem	4 Ea.	8200071
6	Louver	8 Ea.	8200200
7	Span Wire	2 Ea.	8200201
8	TS, 2 Way Span Wire Mtd	4 Ea.	8200230
9	TS, 1 Way Bracket Arm Mtd	2 Ea.	8200254
10	TS, Pedestrian, 1 Way Bracket Arm Mtd	1 Ea.	8200258
11	TS, Pedestrian, 2 Way Bracket Arm Mtd	1 Ea.	8200260
12	TS, Pedestrian, 1 Way Pedestal Mtd	1 Ea.	8200266
13	TS, Pedestrian, 2 Way Pedestal Mtd	1 Ea.	8200268
14	Pushbutton and Sign	3 Ea.	8200287
15	Case Sign, Four Way, 600 mm by 750 mm	2 Ea.	8200308
16	Controller and Cabinet, Solid State Actuated, Delivered	1 Ea.	8200330
17	Controller and Cabinet, Solid State Actuated	1 Ea.	8200334
18	Strain Pole, Steel, Anchor Base, 10970 mm	1 Ea.	8200414
19	Strain Pole, Fdn, Uncased	4m	8200420
20	Pedestal, Alum	2 Ea.	8200428
21	Pedestal, Fdn	2 Ea.	8200430
22	Serv Disconnect	1 Ea.	8200514
23	Unused		
24	Conduit, DB, 1.75 mm	20m	8190064
25	Conduit, Jacked Bored	58m	8190100
26	Hh, Round	3 Ea.	8190347
27	Sec Cable, 600V, 1, 2/C#2	302m	8190420

All dimensions are in meters unless otherwise noted.



PLAN 1:400



WIRING DIAGRAM NOT TO SCALE

TRANS CORE
110 S. Church Ave. Suite 2470
Tucson, AZ 85701
(520)624-2306 FAX (520)624-5290

CONTROL SECTION	JOB NUMBER	FEDERAL NUMBERS		AUTH. NO.	DRAWN	CONST SHEET NO.
		PROJECT	ITEM			
82131	53109A			CONT. SEC. 82131	KRH/SAL	M-1 (WOODWARD) AT
				ENGR/TECH MJM	DATE 08-00	BUS LOOP EXIT
				SHEET 15 OF	SCALE 400	CITY OF DETROIT
				PLAN 82131-01-045		WAYNE COUNTY

TRAFFIC SIGNAL TIMING PERMIT

	PHASE	1	2	3	4	5	6	7	8			
APPROACH										TIMING INSTALLED		
MINIMUM GREEN PASSAGE										REMARKS		
MAXIMUM NO. 1												
MAXIMUM NO. 2												
YELLOW CHANGE												
RED CLEARANCE												
WALK PEDESTRIAN CLEARANCE												
EXTENDED PED. CLEARANCE												
NON-LOCK MEMORY DUAL ENTRY												
INITIALIZATION NON-ACT RESPONSE												
VEHICLE RECALL PEDESTRIAN RECALL												
	CYCLE									O1	O2	O3
DIAL SPLIT												
DIAL SPLIT												
DIAL SPLIT												
DIAL SPLIT												
DIAL SPLIT												
	MODE											
<u>PHASE</u>										PREPARED BY: DATE:		
1										FLASH SCHEDULE DAILY NONE		
2										(TIME & DAY)		
3										NIGHT FLASH:		
4										CONFLICT FLASH:		
5										LOCATION:		
6										CITY/TWP:		
7										COUNTY :		
8										RR PRE-EMPT	MILE POINT	CONTROL SECTION-SPOT #
										FIRE PRE-EMPT		

ADVANCED TIMING PARAMETERS FORM

SYSTEM INFORMATION	LEFT-TURN PHASING										RING AND BARRIER STRUCTURE (EPAC ONLY)																											
	Phase # / Description	Permissive-Protected					Protected-Only					B1				B2				B3				B4														
		Lead	Lag	Split	Lead	Lag	R1																															
<i>Controller Type:</i> EPIC EPAC EF140 Other:																																						
	PHASE OVERLAPS (EPAC ONLY)										DISAPPEARING LEGEND CASE SIGNS																											
<i>System Type:</i> Closed Loop TBC None Other:	<i>Overlap Phase</i>					<i>Phases Overlapped</i>					<i>T.G. (s)</i>				<i>Y (s)</i>				<i>R (s)</i>																			
	=																																					
	=																																					
	=																																					
	VEHICULAR AND PEDESTRIAN DETECTION																																					
	<i>Vehicle Detection</i>													<i>Pedestrian Detection</i>																								
<i>If TBC, Synch by:</i> TOD Event	Approach	Movements and Call Delay (s)						Type			Push-Button Crossing Locations																											
		Left	Thru	Right	Loop	Video	Other																															
<i>Interconnect Type:</i> Hardwire Fiber-Optic Radio Phone Drop None Other:																																						
	PREEMPTION INFORMATION																																					
<i>If Phone Drop, Phone #:</i>	Preempt # =	Time (s)	Locking												Non-Locking																							
			Intervals/Phases		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24										
<i>Controller Status:</i> Master Slave Isolated TBC	SEL Ped CI	Vehicle	Track																																			
	SEL Yellow		Dwell																																			
	SEL Red CI		Cycle																																			
	TRACK Green		Exit																																			
<i>If Slave, Master Location:</i>	TRACK Ped CI	Ped	Track																																			
	TRACK Yellow		Dwell																																			
	TRACK Red CI		Cycle																																			
<i>MCSS#:</i> <i>Reference #:</i>	DWELL Green	Overlap Vehicle	Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X											
	RET Ped CI		Track																																			
	RET Yellow		Dwell																																			
	RET Red CI		Cycle																																			
<i>Remarks:</i>											Prepared by:						Date:						Location:															
											MDOT		County		City		Consultant		City/Twp:				County:															
											Job # (If Applicable):						Mile Point				Control Section-Spot #																	

Intersection 5

Woodward Ave

40 MPH

Woodward Ave & W State Fair Ave

Signalized



W State Fair Ave

30 MPH

10'

12'

6'

13'

20'

23'

20'

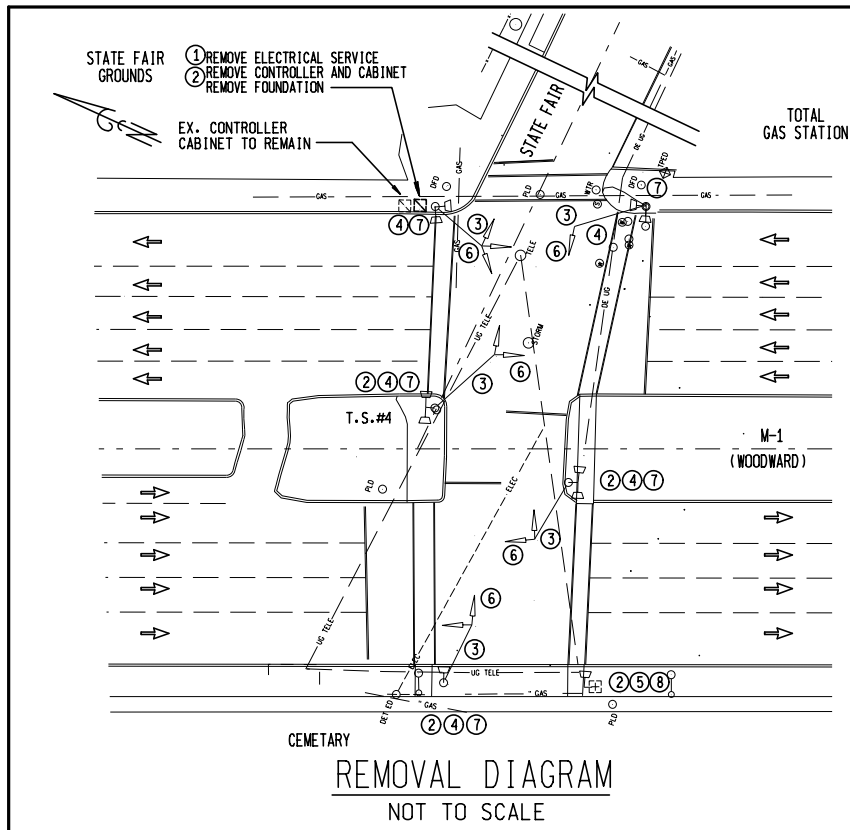
11'

12'

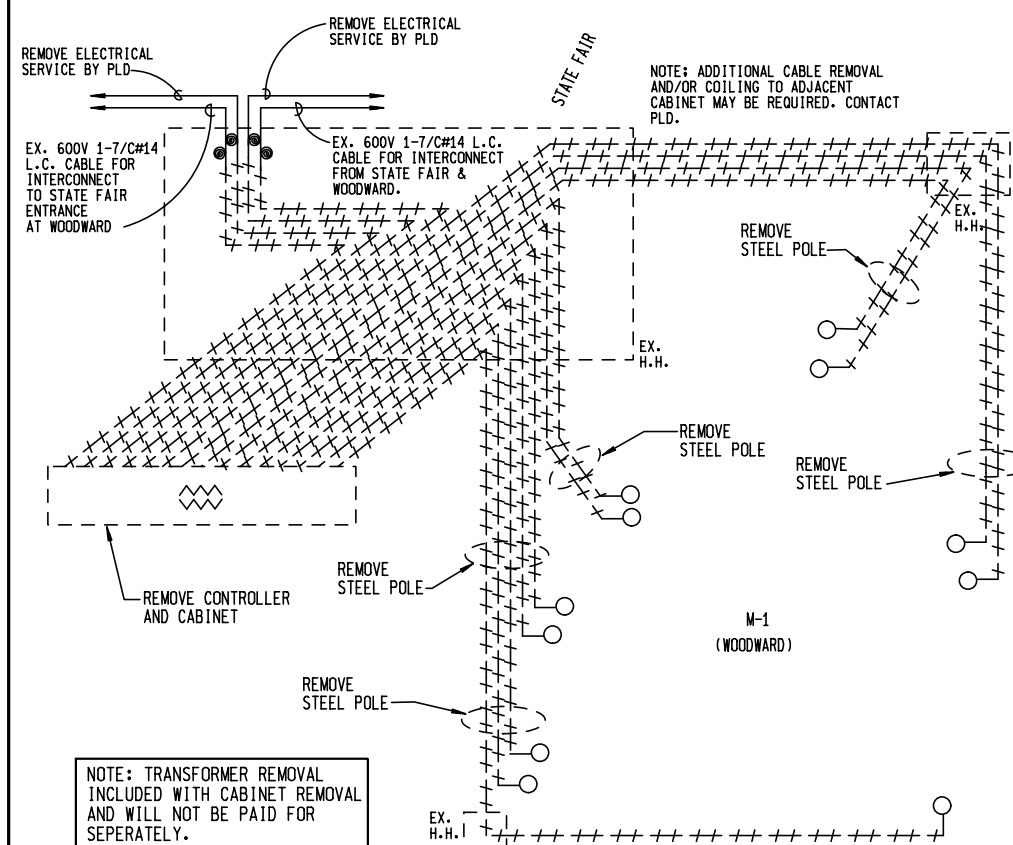
Woodward Ave

40 MPH

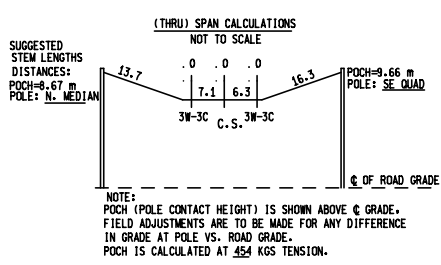




REMOVAL DIAGRAM NOT TO SCALE



REMOVAL WIRING DIAGRAM NOT TO SCALE

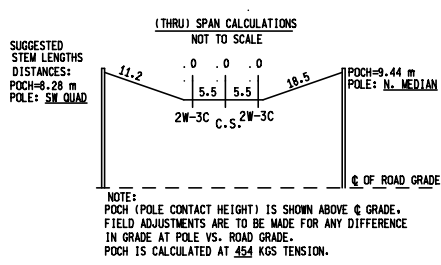


NORTHBOUND
CONTACT JUBI CHACKUNKAL AT THE CITY OF DETROIT TRAFFIC ENGINEERING (313) 267-7231 FOR STREET NAME SIGN REMOVAL.

CONTACT: DETROIT EDISON: LARRY JONES, (313) 235-2055 72 HOURS IN ADVANCE OF SPAN WIRE POWER ACTIVATION. COST TO CONTRACTOR \$520.00.

FOR ELECTRICAL SERVICE INSPECTION CONTACT THE MICHIGAN DEPARTMENT OF LABOR AT 517-241-9320 COST TO CONTRACTOR WILL BE \$40.00.

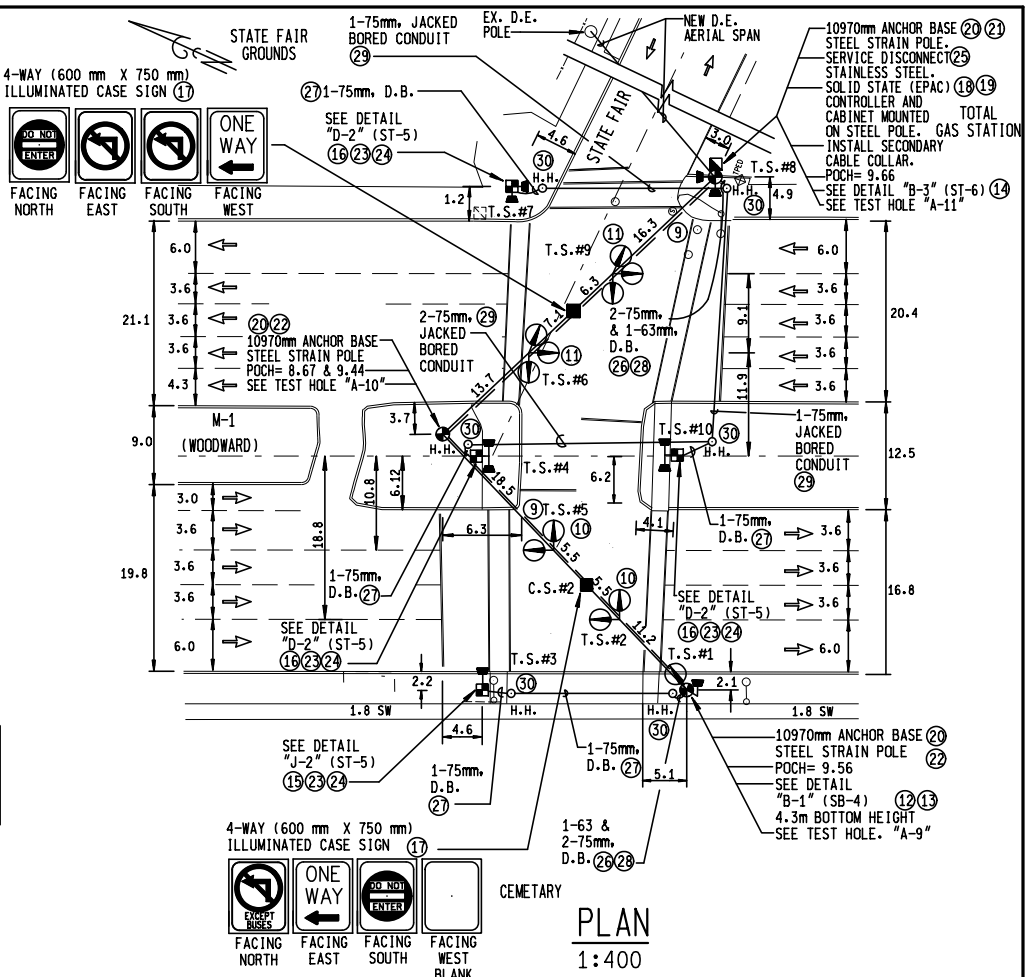
CERTAIN PLD OWNED FACILITIES DEPICTED ON THESE PLANS MAY HAVE BEEN REMOVED OR RELOCATED IN CONJUNCTION WITH PROPOSED OR ACTUAL PLD IMPROVEMENTS.



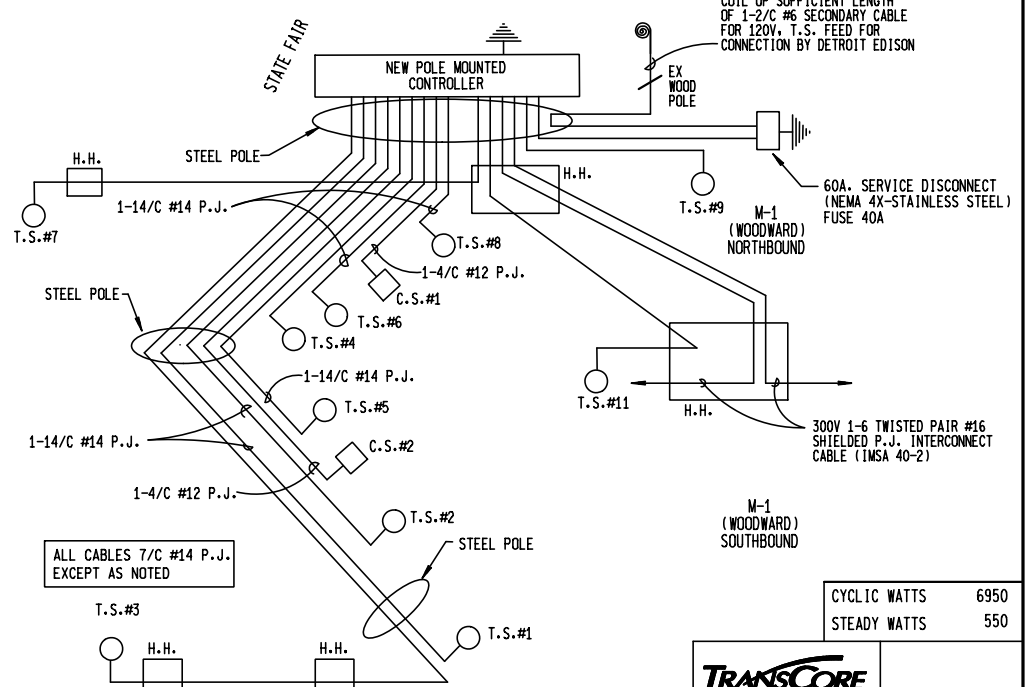
SOUTHBOUND
NOTE: SPLIT WIRE TRAFFIC HEADS FOR INTERNAL CLEARANCE
HAND DIG ENTIRE DEPTH OF ALL FOUNDATIONS
CAUTION: HIGH VOLTAGE & FIBER OPTIC CABLES MAY EXIST

CONTACT: CITY OF DETROIT PUBLIC LIGHTING: KRIS ANALIL 313-267-7231 72 HOURS IN ADVANCE FOR REMOVAL OF INTERCONNECT AND ELECTRIC SERVICE.

LIST OF MATERIAL			
NO.	ITEM	QUANTITIES	ITEM CODE
1	Controller and Cabinet, Rem	1 Ea.	8200017
2	Fdn, Rem	5 Ea.	8200022
3	Mast Arm, Rem	5 Ea.	8200035
4	Mast Arm Std, Rem	5 Ea.	8200036
5	Pedestal, Rem	1 Ea.	8200039
6	TS, Mast Arm Mtd, Rem	5 Ea.	8200067
7	TS, Pedestrian, Bracket Arm Mtd, Rem	5 Ea.	8200069
8	TS, Pedestrian, Pedestal Mtd, Rem	1 Ea.	8200070
9	Span Wire	2 Ea.	8200201
10	TS, 2 Way Span Wire Mtd	2 Ea.	8200230
11	TS, 3 Way Span Wire Mtd	2 Ea.	8200243
12	TS, 1 Way Bracket Arm Mtd	1 Ea.	8200254
13	TS, Pedestrian, 1 Way Bracket Arm Mtd	1 Ea.	8200258
14	TS, Pedestrian, 2 Way Bracket Arm Mtd	1 Ea.	8200260
15	TS, Pedestrian, 1 Way Pedestal Mtd	1 Ea.	8200266
16	TS, Pedestrian, 2 Way Pedestal Mtd	3 Ea.	8200268
17	Case Sign, Four Way, 600 mm by 750 mm	2 Ea.	8200308
18	Controller and Cabinet, Solid State Actuated, Delivered	1 Ea.	8200330
19	Controller and Cabinet, Solid State Actuated	1 Ea.	8200334
20	Strain Pole, Steel, Anchor Base, 10970 mm	3 Ea.	8200414
21	Strain Pole, Fdn, Uncased	4m	8200420
22	Strain Pole, Fdn, Cased	8m	8200421
23	Pedestal, Alum	4 Ea.	8200428
24	Pedestal, Fdn	4 Ea.	8200430
25	Serv Disconnect	1 Ea.	8200514
26	Conduit, DB, 1, 63 mm	10m	8190063
27	Conduit, DB, 1, 75 mm	40m	8190064
28	Conduit, DB, 2, 75 mm	10m	8190066
29	Conduit, Jacked Bored	83m	8190100
30	Hh, Round	6 Ea.	8190347



PLAN 1:400



WIRING DIAGRAM NOT TO SCALE

CYCLIC WATTS 6950
STEADY WATTS 550

TransCore
110 S. Church Ave. Suite 2470
Tucson, AZ 85701
(520)624-2306 FAX (520)624-5290

All dimensions are in meters unless otherwise noted.

CONTROL SECTION	JOB NUMBER	FEDERAL NUMBERS		AUTH. NO.	DRAWN	DATE	M-1 (WOODWARD) AT STATE FAIR CITY OF DETROIT WAYNE COUNTY	CONST SHEET NO.
		PROJECT	ITEM					
82131	53109A			82131-01-044	KRH/SAL	08-00		

NTCIP TRAFFIC SIGNAL TIMING PERMIT

APPROACH	PHASE	1	2	3	4	5	6	7	8	TIMING INSTALLED	PRE-EMPT COUNTDOWN PEDS <input type="checkbox"/>
MINIMUM GREEN			NB/SB		WB					REMARKS Temporary timing permit maintaining existing operation for controller and cabinet replacement with JN 133164. Updated timing permit will be installed with optimization project JN 124092.	<input type="checkbox"/>
PASSAGE / EXTEND1			10		10						
MAXIMUM GREEN NO. 1			0.0		0.0						
MAXIMUM GREEN NO. 2			44		22						
YELLOW CLEARANCE			0		0						
ALL RED CLEARANCE			3.9		3.5						
			1.3		5.3						
WALK			7		7						
FLASHING DON'T WALK (FDW) CLEARANCE			11		17						
EXT PED CLR (EOG, EOY, 3.0s)			EOY		EOY						
WALK REST MODIFIER (Y, N)			N		N						
START UP STATE (G/W, R, G, Y)			G/W								
VEHICLE RECALL (NONE, MIN, MAX, SOFT)			MAX		MAX						
PEDESTRIAN RECALL (NONE, RECL, OTHR)			RECL		RECL						
DUAL ENTRY (Y, N)			N		N						
MODE (CRD, MIN, MAX, NOCRD)			CRD		NOCRD						
DAILY FLASH (Y, R, DK, NA)			NA		NA						
CONFLICT FLASH (Y, R, DK)			R		R						
EVNT/ACTN PLN 1	OFFSET 85	CYCLE 100		69		31					
EVNT/ACTN PLN 2	OFFSET 109	CYCLE 120		89		31					
EVNT/ACTN PLN 3	OFFSET 9	CYCLE 120		89		31					
EVNT/ACTN PLN	OFFSET	CYCLE									
EVNT/ACTN PLN	OFFSET	CYCLE									
EVNT/ACTN PLN	OFFSET	CYCLE									

Hours of Operation
 Event/Action Plan 1 - Normal
 Event/Action Plan 2 - 07:00-09:00, Mon-Fri
 Event/Action Plan 3 - 15:00-18:00, Mon-Fri

FLASH HOURS:
 to DAILY NONE
 to

PHASE	VEHICLE OVERLAPS									
	Overlap Phase	Load Bay	Phases Overlapped	T.G. (s)	Y (s)	R (s)	FYA Phases Perm Prot		Flash Daily Confl	
1										
2 NB/SB M-1 (Woodward)	C = State Fair Ave Fars	11	4	3.0	3.5	2.3			NA	R
3	=									
4 WB State Fair Ave. Nears	=									
5	=									
6	=									
7	=									
8	=									

CONTROLLER and FIRMWARE# PREPARED BY:
 Siemens (SEPA) CJS
 ECONOLITE (EOS) DATE: 03/16/20
 Other:

LOCATION:
 M-1 (Woodward) @ State Fair Ave
 CITY/TWP: Detroit
 COUNTY : Wayne

MILE POINT CONTROL SECTION-SPOT #
 0.57 82131-01-044

Job # (If Applicable): 133164

CLEAR ALL

ADVANCED TIMING PARAMETERS FORM

SYSTEM INFORMATION System Type: <input checked="" type="checkbox"/> Central Group ID <input type="checkbox"/> TBC <input type="checkbox"/> None <input type="checkbox"/> Other: Location ID: Interconnect: <input type="checkbox"/> HARDWIRE <input type="checkbox"/> FIBER-OPTIC <input type="checkbox"/> RADIO <input type="checkbox"/> SERIAL RADIO <input type="checkbox"/> IP RADIO <input type="checkbox"/> TBC <input type="checkbox"/> GPS CLOCK <input checked="" type="checkbox"/> CELL MODEM <input type="checkbox"/> NONE <input type="checkbox"/> Other:	LEFT-TURN PHASING						RING AND BARRIER STRUCTURE													
	Phase # / Description	Permissive-Protected			Protected-Only			R1	B1			B2			B3			B4		
		Lead	Lag	Split	Lead	Lag	2				4									
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R2													
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R3													
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R4													
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>														
VEHICULAR AND PEDESTRIAN DETECTION							COORDINATION/OPERATION SETTINGS													
Approach	Vehicle Detection						Pedestrian Detection					CHANGE (ADD ONLY, ADD/SUBT, OTHR)	SMOOTH							
	Movements and Call Delay (s)			Locking			Push-Button Crossing Locations													
	Left	Thru	Right	Left	Thru	Right														
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>														
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>														
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>														
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>														
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>														
ADDITIONAL EVENT/ACTION PLAN DATA											DISAPPEARING CASE SIGN									
PHASE			1	2	3	4	5	6	7	8										
EVNT/ACTN PLN	OFFSET	CYCLE																		
EVNT/ACTN PLN	OFFSET	CYCLE																		
EVNT/ACTN PLN	OFFSET	CYCLE																		
EVNT/ACTN PLN	OFFSET	CYCLE																		
EVNT/ACTN PLN	OFFSET	CYCLE																		
EVNT/ACTN PLN	OFFSET	CYCLE																		
EVNT/ACTN PLN	OFFSET	CYCLE																		
EVNT/ACTN PLN	OFFSET	CYCLE																		
EVNT/ACTN PLN	OFFSET	CYCLE																		
EVNT/ACTN PLN	OFFSET	CYCLE																		
REMARKS																				
											PREPARED BY: CJS DATE: 03/16/20 <input checked="" type="checkbox"/> MDOT <input type="checkbox"/> County <input type="checkbox"/> City <input type="checkbox"/> Consultant									
											LOCATION: M-1 (Woodward) @ State Fair Ave									
											CONTROL SECTION-SPOT # 82131-01-044									

SCHEDULING INFORMATION

Schedule #	Days of Week	Start Date	End Date	Day Plan #	Events
1	Saturday and Sunday	January 1st	December 31st	1	#1 Normal
2	Monday-Friday	January 1st	December 31st	2	#1 Normal #2 - AM Peak 07:00-09:00 #3 - PM Peak 15:00-18:00
<i>Example Values</i>					PREPARED BY: CJS DATE: 03/16/20 LOCATION: M-1 (Woodward) @ State Fair Ave CONTROL SECTION-SPOT # 82131-01-044
1	Saturday and Sunday	January 1st	December 31st	1	
2	Monday - Friday	January 1st	December 31st	2	#1 - Normal #2 - AM Peak 06:00 - 09:00 #3 - PM Peak 14:00 - 18:00

Intersection 6

W State Fair Ave &
Site Driveway C /
Ralston St

Unsignalized



Site Driveway C

27'

25 MPH*

6'

W State Fair Ave

13'

30 MPH

W State Fair Ave

30 MPH

12'

Stop Sign

28'

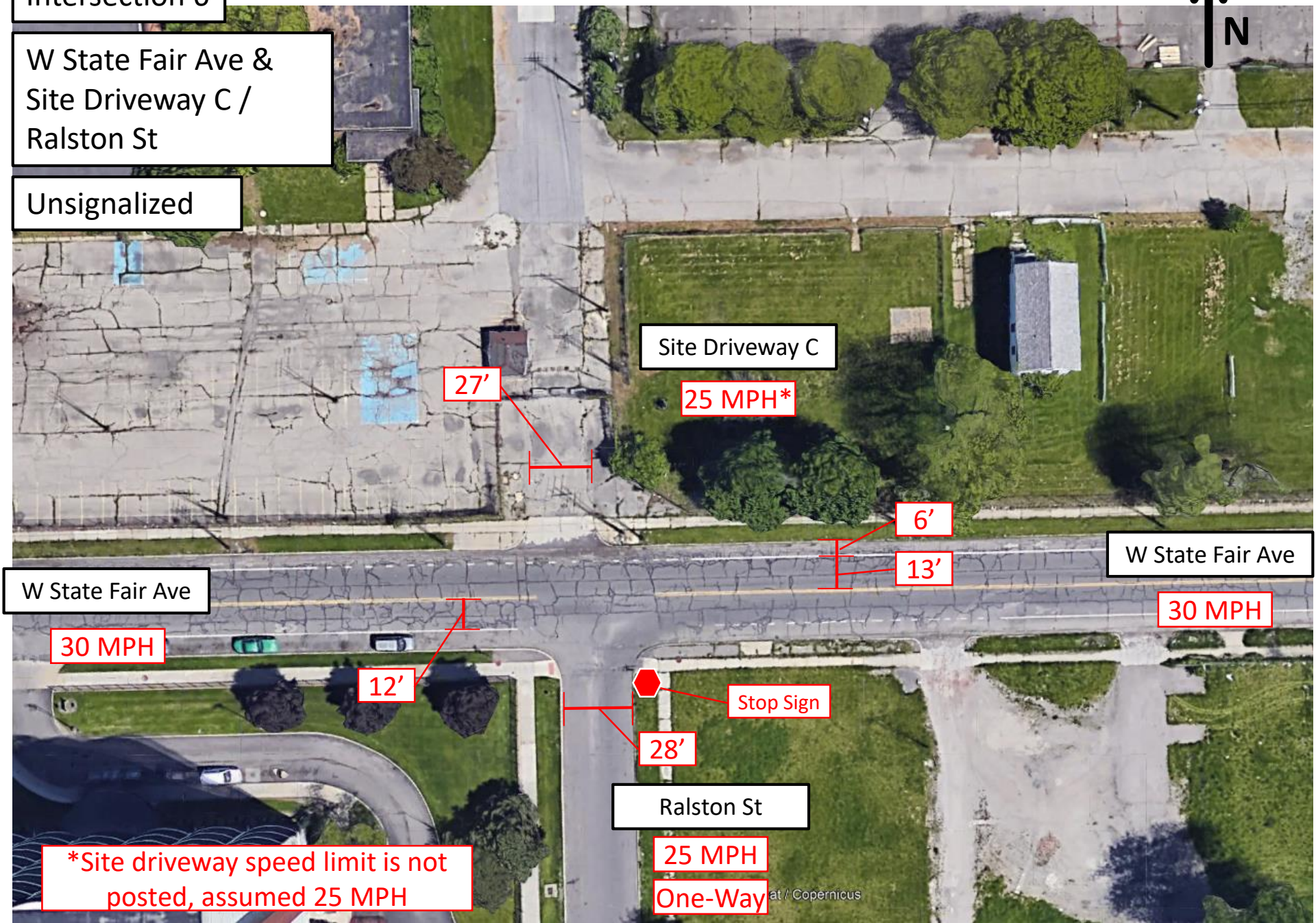
Ralston St

25 MPH

One-Way

*Site driveway speed limit is not posted, assumed 25 MPH

at / Copernicus



Intersection 7

W State Fair Ave &
Site Driveway D

Unsignalized



Site Driveway D

25 MPH*

6'

13'

W State Fair Ave

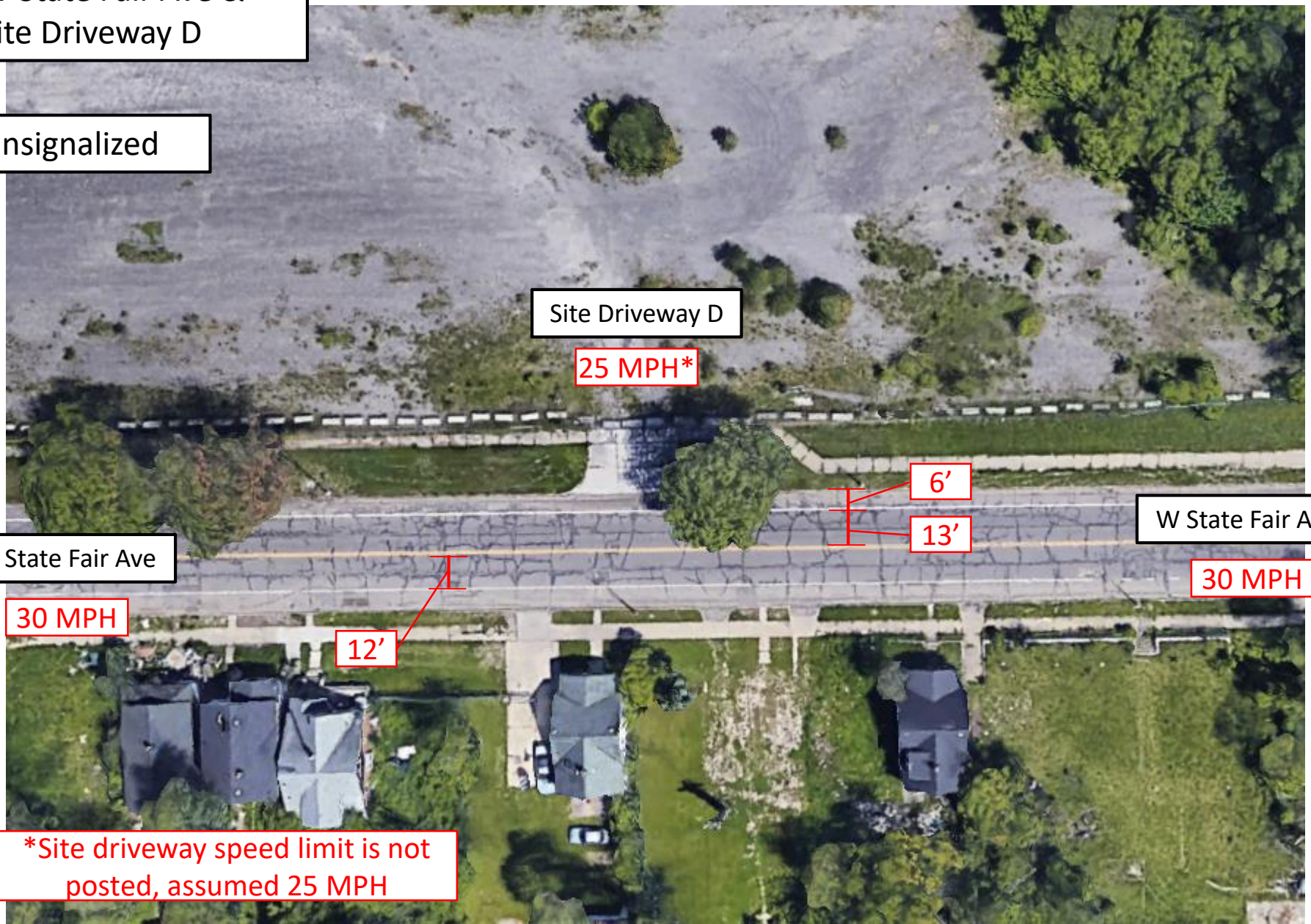
W State Fair Ave

30 MPH

30 MPH

12'

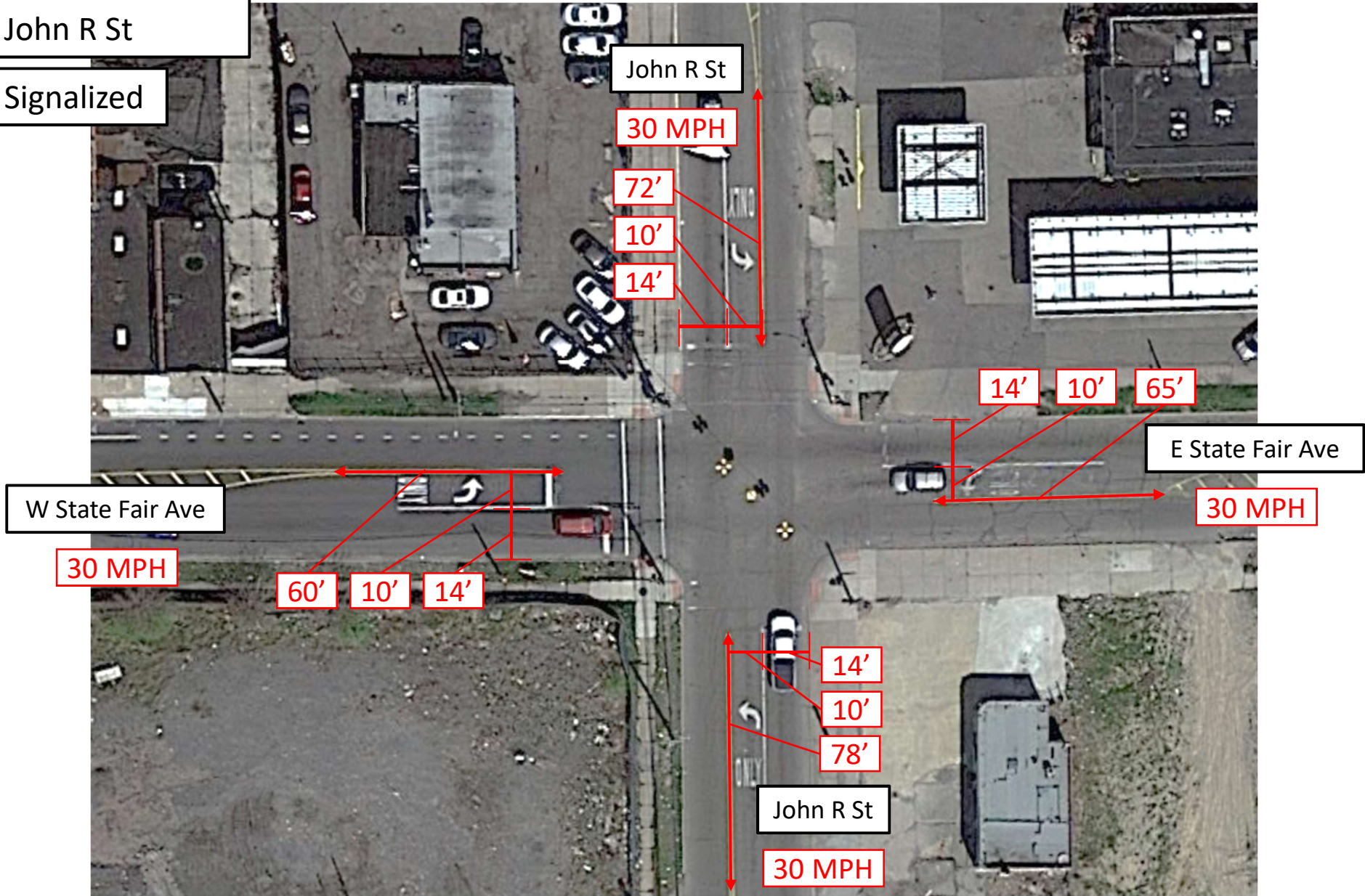
*Site driveway speed limit is not
posted, assumed 25 MPH

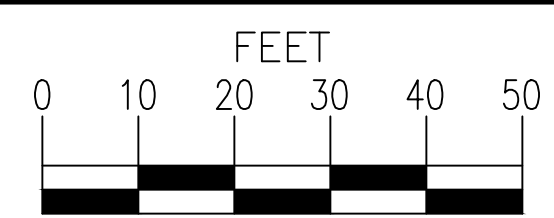


Intersection 8

State Fair Ave &
John R St

Signalized



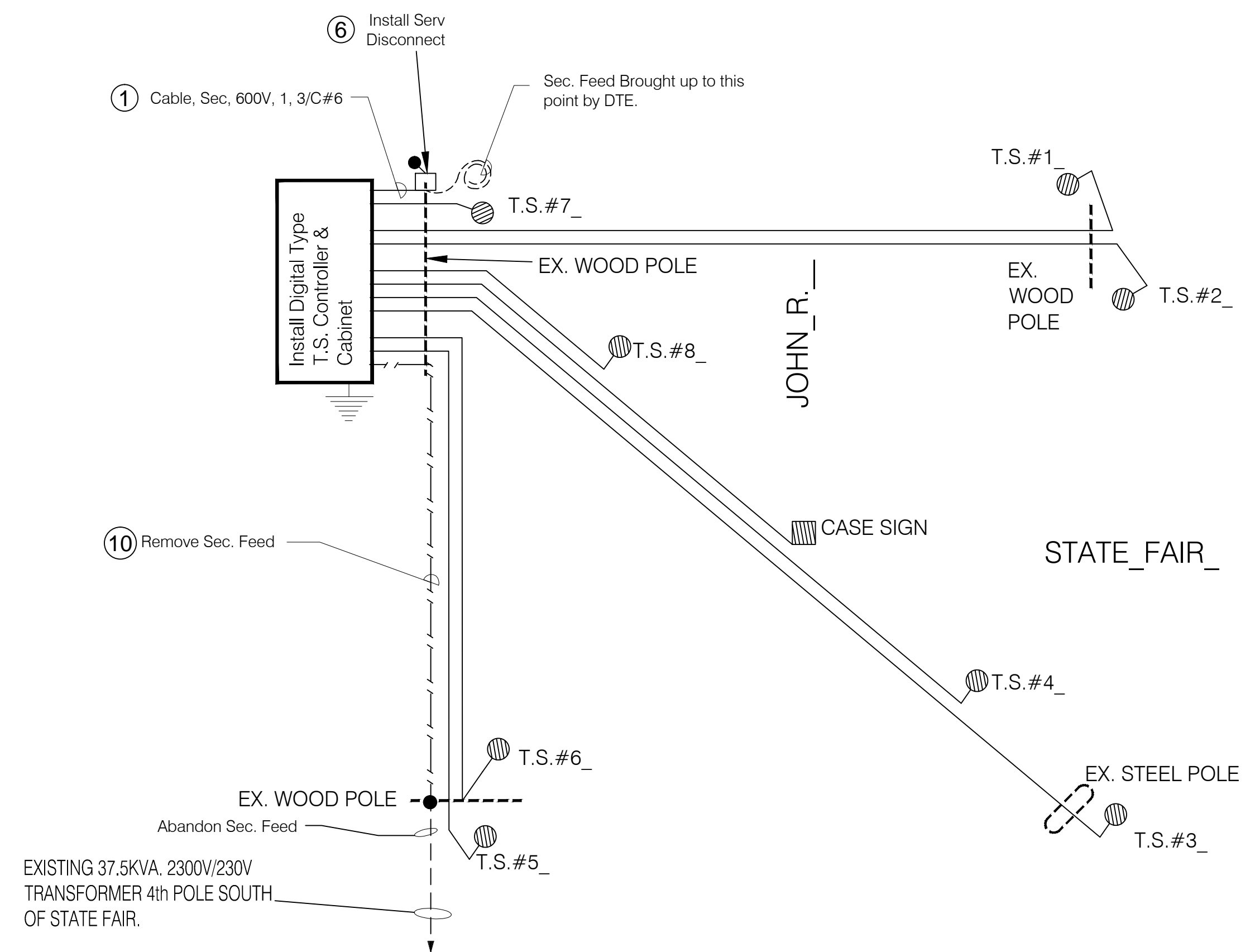


TS /PS Head Type	Cable Type
1W3C TS	1-7/C # 16 PJ
2W3C TS	1-10/C # 16 PJ
3W3C TS	1-12/C # 16 PJ
4W3C TS	2-10/C # 16 PJ
1W2S PS	1-5/C # 16 PJ
2W2S PS	1-7/C # 16 PJ
Case Sign	1-3/C # 16 PJ
Pushbutton	1-2/C #12 SHIELDED (IMSA 50-2)

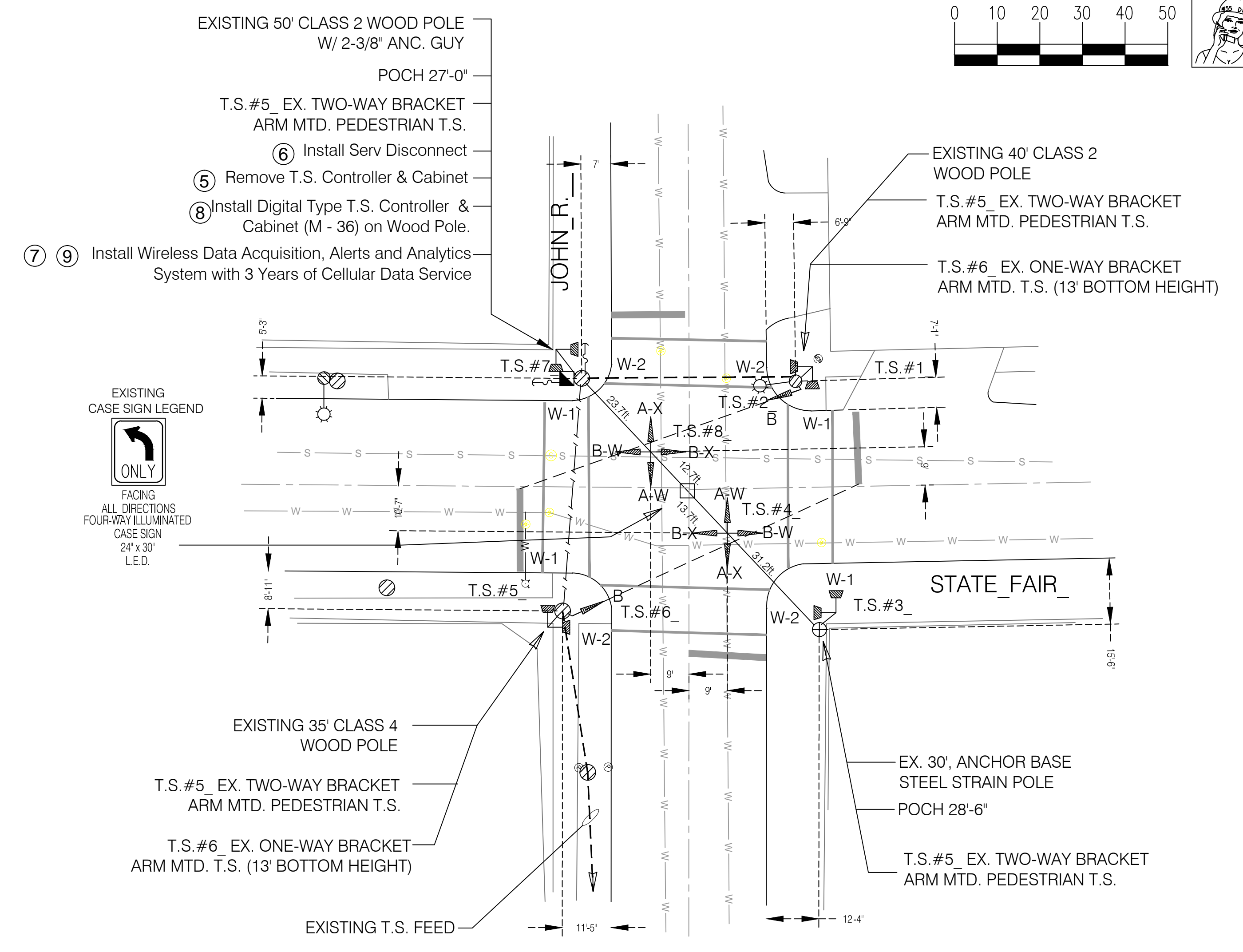
DOWN TIME NOTE:
 THE CONTRACTOR SHALL COMPLETE THE SWITCH OVER FROM THE EXISTING T.S. EQUIPMENT TO THE NEW T.S. EQUIPMENT IN ONE WORKING DAY. THE EXISTING T.S. EQUIPMENT SHALL NOT BE TURNED OFF PRIOR TO 9:00 AM. THE NEW T.S. EQUIPMENT SHALL BE BACK IN OPERATION PRIOR TO THE CONTRACTOR LEAVING THE LOCATION.

WHILE THE T.S. EQUIPMENT IS NOT IN OPERATION, THE INTERSECTION SHALL BE CONTROLLED WITH ALL DIRECTION STOP CONTROL.

TS= Vehicular Traffic Signal
 PS= Pedestrian Traffic Signal



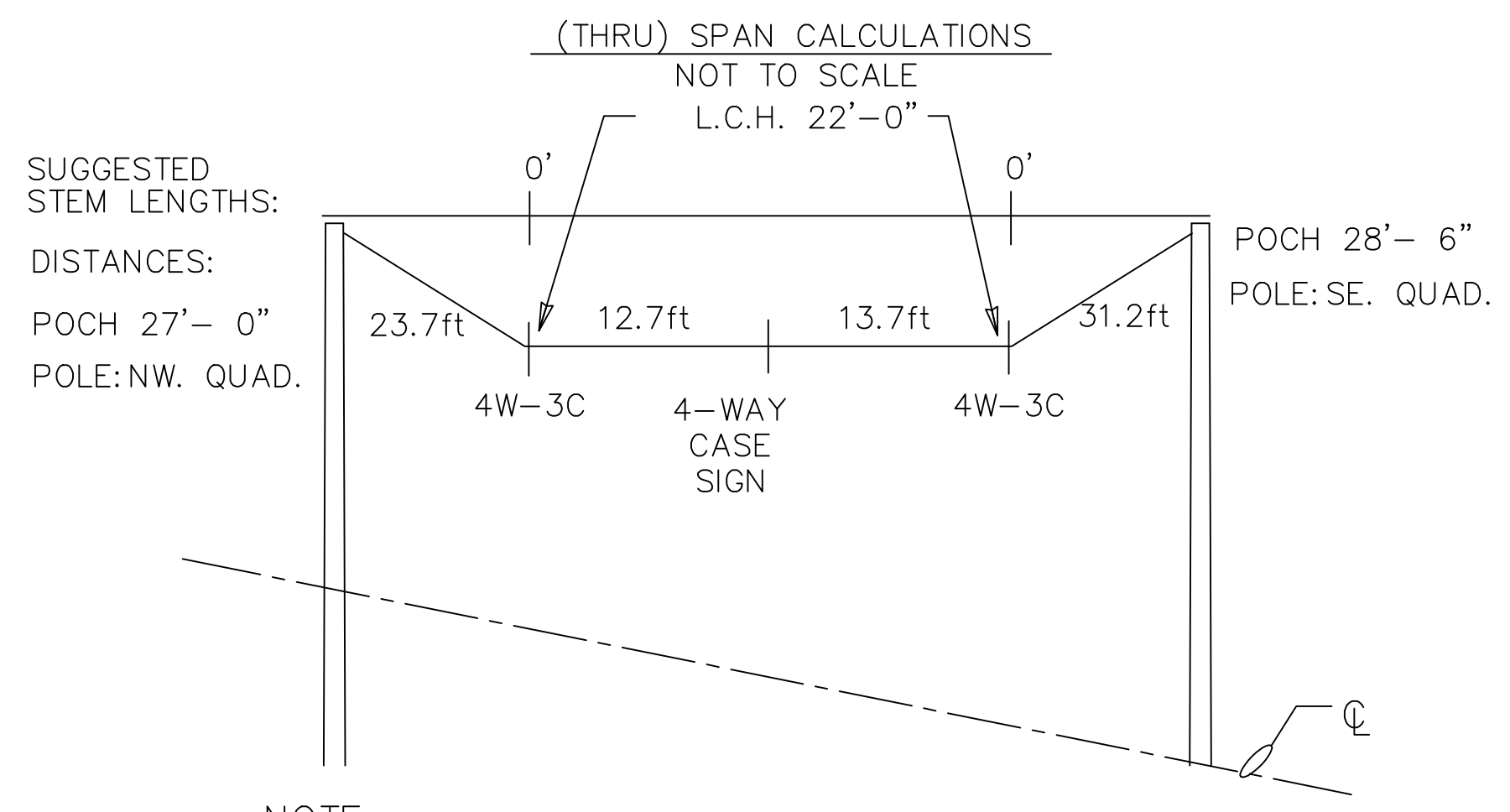
WIRING DIAGRAM
N.T.S.



PLAN
SCALE: 1" = 30"

INSTALLATION

LIST OF MATERIAL			
NO.	ITEMS	QTY	ITEM CODE
1	Cable, Sec, 600V, 1, 3/C #6	30 Ft	8190399
2	Cable, P.J., 600V, 1, 3/C #16	90 Ft	8197001
3	Cable, P.J., 600V, 1, 7/C #16	540 Ft	8197001
4	Cable, P.J., 600V, 1, 10/C #16	360 Ft	8197001
5	Controller and Cabinet, Rem	1 Ea	8200030
6	Serv Disconnect	1 Ea	8200135
7	Cellular Data Service for 3 Years	1 Ea	8207050
8	Controller and Cabinet, Digital Type, ITS	1 Ea	8207050
9	Wireless Data Acquisition, Alerts and Analytics System	1 Ea	8207050
10	Cable, Sec, Rem	80 Ft	8190017



NOTE:
 POCH (POLE CONTACT HEIGHT) IS SHOWN ABOVE ϕ OF ROAD GRADE, FIELD ADJUSTMENTS ARE TO BE MADE FOR ANY DIFFERENCE IN GRADE AT POLE VS. ROAD GRADE.
 POCH IS CALCULATED AT 1000 POUNDS TENSION.

- Notes:
- Contact Kirit Patel of Traffic Engineering, DPW at (313) 628-5641, 48 hours prior to removal of traffic signal equipment and activation of new traffic signals.
 - Contact the system operator of DTE at (800) 477-4747 for electrical service connection.
 - All removed traffic signal equipments shall be salvaged in reusable condition and shall become property of DPW (Department of Public Works). All removed material will be stored on site for pick-up by DPW. All material left for the contractor will become the responsibility of the contractor for disposal away from the site.
 - All foundations that are to be removed, shall be removed full depth, it will be the contractor's responsibility to prove that the foundations have been completely removed.
 - Contractor shall be responsible for programming the controller, and wiring the cabinet. Timing permits can be obtained by contacting Kirit Patel, 313-628-5641, of the City of Detroit DPW, Traffic Engineering Division.
 - Refer to Detail Sheet 1511 for mounting of controller cabinet.

DESCRIPTION	DRN	CKD	APVD	DATE	REFERENCE DRAWINGS	DESIGNED BY	APPROVED:
Final Submittal (Revised Sepcs & Plans)				10-06-2017		Meena Antani	Kirit Patel
Final Submittal				06-16-2017		John Lappin	
G.I. Submittal				03-13-2017		Kirit Patel	

CITY OF DETROIT
DEPARTMENT OF PUBLIC WORKS
TRAFFIC ENGINEERING DIVISION

CHECKED BY:	APPROVED BY:	FILE NO.:	TRAFFIC SIGNAL MODERNIZATION	SHEET 55 OF 75 SHEETS
			AT	October 06, 2017
			JOHN R. and STATE FAIR	DRWG NO. LD-
				JOB NO.: 132515A

JOB NO.: 132515A CONTROL SECTION NO.: SUG 82000

TRAFFIC SIGNAL TIMING PERMIT

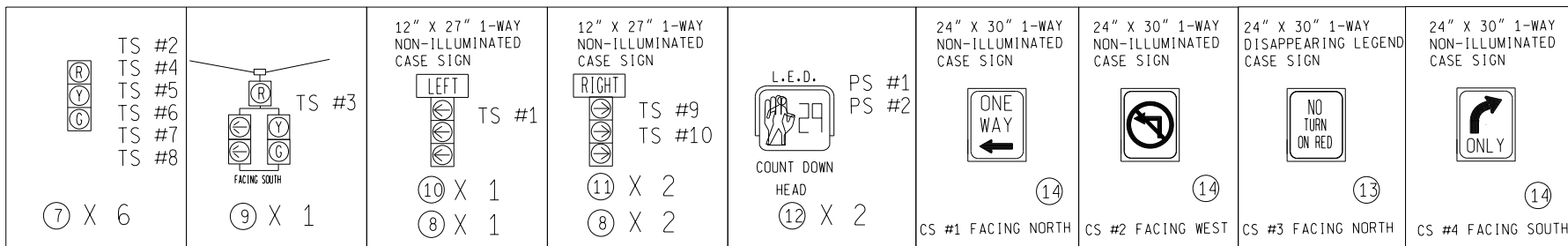
John R & State Fair

APPROACH	PHASE	1	2	3	4	5	6	7	8			
			SB		WB		NB		EB	TIMING INSTALLED 07/27/18		
MINIMUM GREEN			10		7		10		7	REMARKS In conjunction with JN 132515A, install Econolite Cobalt controller and program as follows: NOTE: The codes used are for M 50. Please use comparable/ applicable codes for Econolite instead.		
PASSAGE			0.0		0.0		0.0		0.0			
MAXIMUM NO. 1			25		25		25		25			
MAXIMUM NO. 2												
YELLOW CHANGE			3.5		3.5		3.5		3.5			
RED CLEARANCE			1.8		2.4		1.8		2.4			
WALK			7		7		7		7			
PEDESTRIAN CLEARANCE			13		12		13		12			
EXTENDED PED. CLEARANCE			3		3		3		3			
REST IN WALK												
INITIALIZATION			4		1		4		1			
NON-ACT RESPONSE												
VEHICLE RECALL			2		2		2		2			
PEDESTRIAN RECALL			2		2		2		2			
NON-LOCK MEMORY												
DUAL ENTRY												
		CYCLE								O1	O2	O3
DIAL 1	SPLIT 1	50	25		25		25		25	39		
DIAL 2	SPLIT 1	50	25		25		25		25	39		
DIAL 3	SPLIT 1	50	25		25		25		25	39		
DIAL	SPLIT											
DIAL	SPLIT											
DIAL	SPLIT											
		MODE	1		7		1		7			
PHASE		Hours of Operation:										
1		Dial 111: Normal										
2 SB John R		Dial 211: AM Peak - Mon thru Fri 06:00-09:00										
3		Dial 311: PM Peak - Mon thru Fri 14:00-19:00										
4 WB State Fair												
5												
6 NB John R												
7												
8 EB State Fair												
OVERLAPS												
		<i>Overlap Phase</i>	<i>Load Bays</i>	<i>Phases Overlapped</i>	<i>T.G. (s)</i>	<i>Y (s)</i>	<i>R (s)</i>	<i>-G/Y</i>	<i>+GRN</i>			
		=										
		=										
		=										
		=										
PREPARED BY: SM/KP										DATE: 04/19/18		
FLASH HOURS:												
[] to []										DAILY <input type="checkbox"/> NONE <input checked="" type="checkbox"/>		
NIGHT FLASH:												
FY =										FR =		
CONFLICT FLASH:												
FY =										FR = All Directions		
CONTROLLER TYPE:												
<input type="checkbox"/> EPAC										PRE-EMPT <input type="checkbox"/>		
<input checked="" type="checkbox"/> Other: Econolite										COUNTDOWN PEDS <input checked="" type="checkbox"/>		
LOCATION:												
John R & State Fair												
CITY/TWP: Detroit												
COUNTY : Wayne												
MILE POINT						CONTROL SECTION-SPOT #						
						COD-59						
Job # (If Applicable): 132515A												

ADVANCED TIMING PARAMETERS FORM

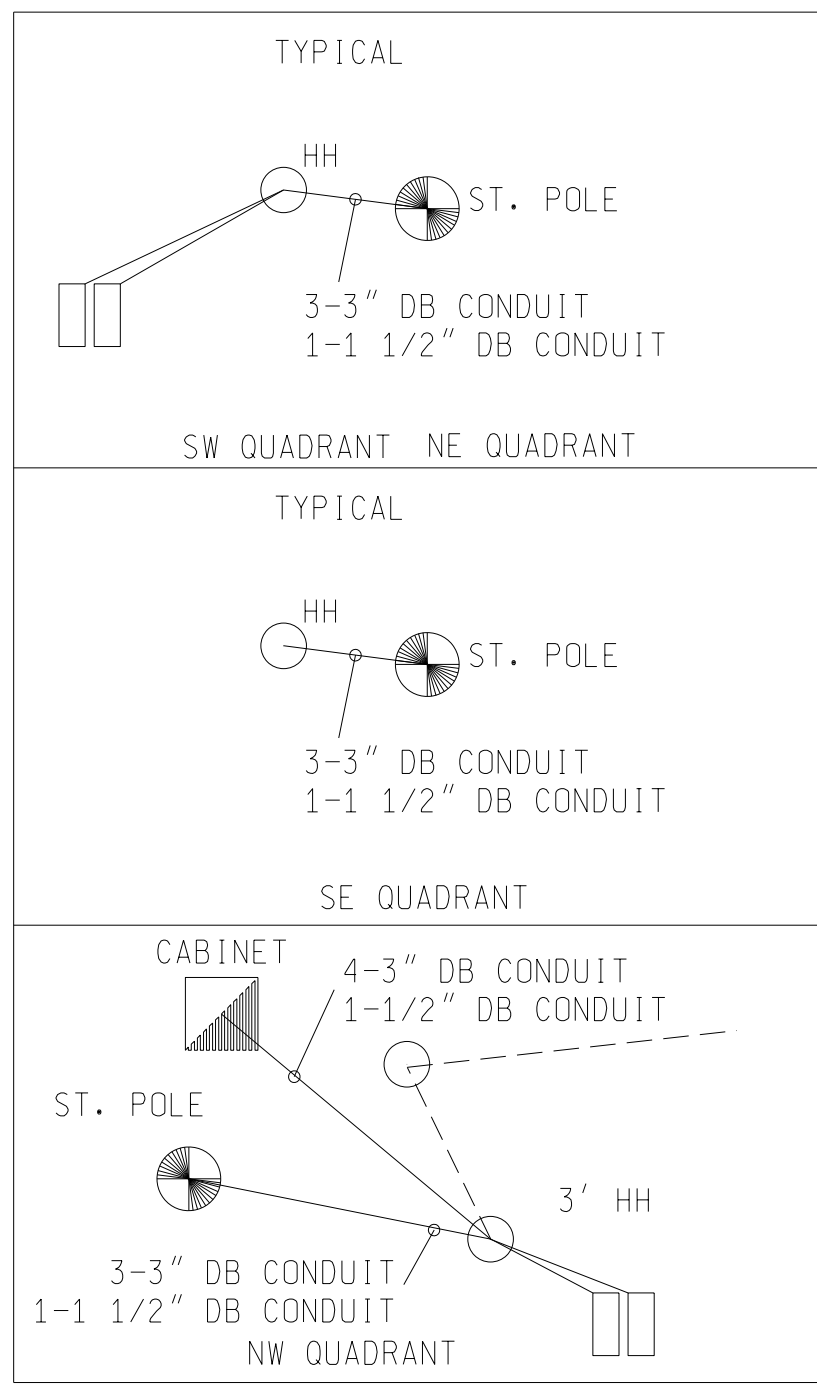
SYSTEM INFORMATION	LEFT-TURN PHASING						RING AND BARRIER STRUCTURE																
Controller Type: <input type="checkbox"/> EPAC <input checked="" type="checkbox"/> Other: Econolite	System Type: <input type="checkbox"/> Closed Loop <input type="checkbox"/> Stand By <input type="checkbox"/> Group 1 <input type="checkbox"/> Group 2 Address: <input checked="" type="checkbox"/> TBC <input type="checkbox"/> TBC/GPS <input type="checkbox"/> None <input type="checkbox"/> Other: If TBC, Synch by: <input checked="" type="checkbox"/> TOD <input type="checkbox"/> Event Interconnect Type: <input type="checkbox"/> Hardwire <input type="checkbox"/> Fiber-Optic <input type="checkbox"/> Radio <input type="checkbox"/> Phone Drop <input type="checkbox"/> None <input checked="" type="checkbox"/> Other: Cellular Modem	Phase # / Description	<i>Permissive-Protected</i>		<i>Protected-Only</i>		B1			B2			B3			B4							
			Lead	Lag	Split	Lead	Lag	R1			2	4											
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R2			6	8											
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R3															
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R4															
VEHICULAR AND PEDESTRIAN DETECTION												DISAPPEARING LEGEND CASE SIGNS											
Approach		<i>Vehicular Detection</i>						<i>Pedestrian Detection</i>															
		Movements and Call Delay (s)			Type			Push-Button Crossing Locations															
		Left	Thru	Right	Loop	Video	Other																
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																
ADDITIONAL DIAL SPLIT DATA												COORDINATION DATA											
		PHASE	1	2	3	4	5	6	7	8	O1	O2	O3	Operation Mode	1								
DIAL	SPLIT	CYCLE												Coordination Mode	0								
DIAL	SPLIT	CYCLE												Maximum Mode	0								
DIAL	SPLIT	CYCLE												Correction Mode	2								
DIAL	SPLIT	CYCLE												Offset Mode	0								
DIAL	SPLIT	CYCLE												Force Mode	0								
DIAL	SPLIT	CYCLE												Max Dwell	0								
DIAL	SPLIT	CYCLE												Yield Period	0								
REMARKS:												ADDITIONAL OVERLAP DATA											
												Overlap Phase	Load Bays	Phases Overlapped	T.G. (s)	Y (s)	R (s)	-G/Y	+GRN				
												=											
												=											
												=											
												=											
If Phone Drop, Phone # : Controller Status: <input type="checkbox"/> Master <input type="checkbox"/> Slave <input type="checkbox"/> Isolated <input checked="" type="checkbox"/> TBC If Slave, Master Location: Master Spot # :												PREPARED BY: SM/KP DATE: 04/19/18 <input type="checkbox"/> MDOT <input type="checkbox"/> County <input checked="" type="checkbox"/> City <input type="checkbox"/> Consultant						LOCATION: John R & State Fair CONTROL SECTION-SPOT # COD-59					

CLEAR PAGE 2

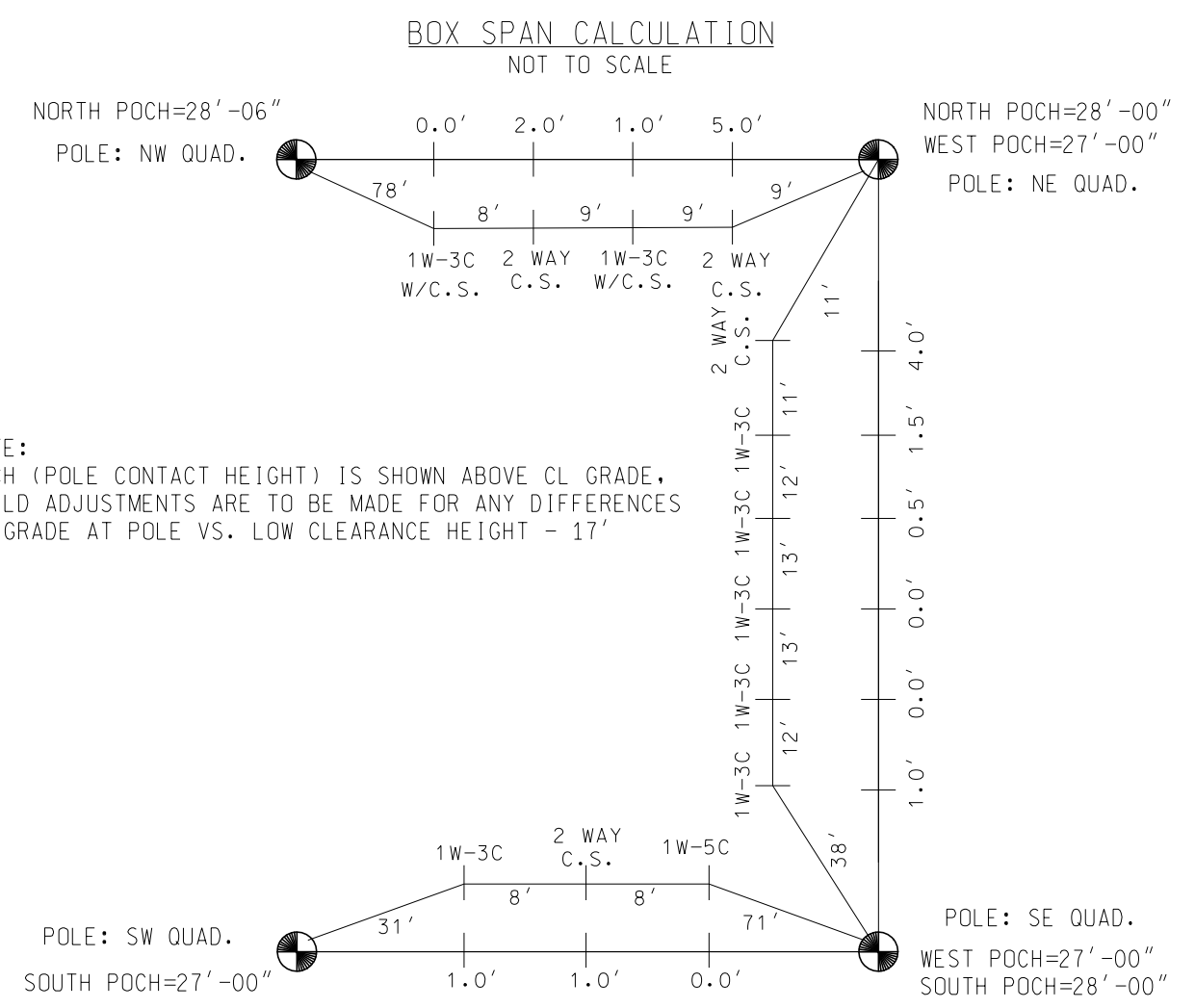


CONTACT: CHANNELLE BARNES OF DTE ENERGY AT 313-235-4427 FOR SERVICE DISCONNECT AND RECONNECT. ER.#XXXXX. COST TO CONTRACTOR \$XXXX.XX

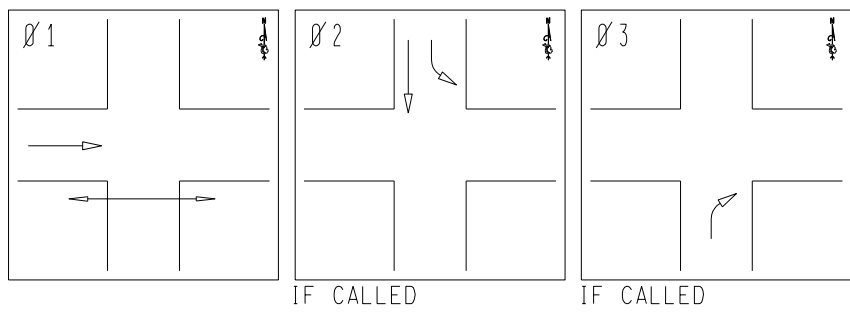
FOR ELECTRICAL SERVICE INSPECTION CONTACT MICHIGAN DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS AT 517-373-1820 COST TO CONTRACTOR WILL BE INCIDENTAL



LIST OF MATERIAL			
NO.	ITEM	QUANTITIES	ITEM CODE
1	Serv Disconnect	1 Ea	8200135
2	Controller and Cabinet, Digital Type	1 Ea	8207050
3	Span Wire	3 Ea	8200140
4	Controller Fdn, Base Mount	1 Ea	8200045
5	Hh, Round	3 Ea	8190260
6	HH, 3' Diameter	1 Ea	8190259
7	TS, One Way Span Wire Mtd. (LED)	6 Ea	8200313
8	Case Sign, One Way, 12 inch by 27 inch, Non-Illuminated	3 Ea	8200433
9	TS, One Way Span Wire Mtd, Five Sect (LED)	1 Ea	8200315
10	TS, One Way Bracket Mtd, LTGA (LED)	1 Ea	8207050
11	TS, One Way Span Wire Mtd, RTGA (LED)	2 Ea	8200318
12	TS, Pedestrian, One Way Bracket Arm Mtd (LED)	2 Ea	8200337
13	Case Sign, Disappearing Legend, 24 inch by 30 inch	1 Ea	8200016
14	Case Sign, One Way, 24 inch by 30 inch, Non-Illuminated	3 Ea	8200434
15	Strain Pole, Steel, 6 Bolt, 30 Foot	4 Ea	8200460
16	Strain Pole Fdn, 6 Bolt	48 Ft	8200470
17	Traf Loop	4 Ea	8200170
18	Digital Loop Detector	2 Ea	8200055
○	Conduit, DB, 1, 1 1/2 inch	60 Ft	8190027
○	Conduit, DB, 3, 3 inch	60 Ft	8190035
○	Conduit, DB, 4, 3 inch	30 Ft	8207038



NOTE:
POCH (POLE CONTACT HEIGHT) IS SHOWN ABOVE CL GRADE.
FIELD ADJUSTMENTS ARE TO BE MADE FOR ANY DIFFERENCES
IN GRADE AT POLE VS. LOW CLEARANCE HEIGHT - 17'



NOTES:
1. ANY COST ASSOCIATED WITH CONNECTION TO EXISTING INTERCONNECT WILL BE INCIDENTAL TO OTHER PAY ITEMS.
2. CONTRACTOR TO UTILIZE EXISTING CONDUITS AND HANDHOLES. OTHERWISE, NEW CONDUITS AND HANDHOLES TO BE INSTALLED AS DIRECTED BY ENGINEER.

FINAL ROW PLAN REVISIONS (SUBMITTAL DATE 03/16/2012)							
NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION

PARSONS BRINCKERHOFF, INC.
500 GRISWOLD ST. SUITE 2900
DETROIT, MI 48226
313-963-5760



DATE: 3/16/2012
DESIGN UNIT: TRAFFIC SIGNALS
TSC: DETROIT
PLAN: 82143-01-115
FILE: 8214301115e-pr031612ct.dgn

CS: 82143
JN: PERMIT

TRAFFIC SIGNAL INSTALL SHEET
EB M-102 (8 MILE ROAD) AT
X-OVER WEST OF FAIR STREET
OAKLAND AND WAYNE COUNTIES

OPENINGS	35
CYCLIC	411
STEADY	160
DRAWING	SHEET

TRAFFIC SIGNAL TIMING PERMIT

APPROACH	PHASE	1	2	3	4	5	6	7	8																																																															
			EB		NB				SB	TIMING INSTALLED																																																														
MINIMUM GREEN PASSAGE			10		7				7	REMARKS																																																														
MAXIMUM NO. 1			80		20				20	Adjusted Splits per request of the Detroit TSC EPAC controller.																																																														
MAXIMUM NO. 2			80		20				20																																																															
YELLOW CHANGE			3.9		3.5				3.5	Pedestrian clearance interval calculated per 2011 MMUTCD.																																																														
RED CLEARANCE			2.3		2.5				2.5	Split phase operation. Phases 4 and 8 alternate every cycle. Ex. Cycle 1 phase 4 goes, Cycle 2 phase 8 goes.																																																														
WALK			7		0				0																																																															
PEDESTRIAN CLEARANCE			25		0				0																																																															
EXTENDED PED. CLEARANCE			0		0				0																																																															
REST IN WALK			0		0				0																																																															
INITIALIZATION			4		1				1																																																															
NON-ACT RESPONSE			0		0				0																																																															
VEHICLE RECALL			3		0				0																																																															
PEDESTRIAN RECALL			2		0				0																																																															
NON-LOCK MEMORY			0		0				0																																																															
DUAL ENTRY			0		0				0																																																															
		CYCLE								O1	O2	O3																																																												
DIAL 1	SPLIT 1		80		20				20	37																																																														
DIAL 2	SPLIT 1		80		20				20	55																																																														
DIAL 3	SPLIT 1		80		20				20	37																																																														
DIAL	SPLIT																																																																							
DIAL	SPLIT																																																																							
DIAL	SPLIT																																																																							
		MODE		1		0			0																																																															
<p>PHASE</p> <p>1 D1/S1/O1 Normal</p> <p>2 Eastbound M-102 (8 Mile Road) D2/S1/O1 Monday-Friday, 06:00-09:00</p> <p>3 D3/S1/O1 Monday-Friday, 14:00-18:00</p> <p>4 Northbound Driveway</p> <p>5</p> <p>6</p> <p>7</p> <p>8 Southbound Crossover</p>																																																																								
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="10">OVERLAPS</th> </tr> <tr> <th>Overlap Phase</th> <th>Load Bays</th> <th>Phases Overlapped</th> <th>T.G. (s)</th> <th>Y (s)</th> <th>R (s)</th> <th>-GY</th> <th>+GRN</th> <th colspan="2"></th> </tr> </thead> <tbody> <tr> <td>=</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td colspan="2"></td> </tr> <tr> <td>=</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td colspan="2"></td> </tr> <tr> <td>=</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td colspan="2"></td> </tr> <tr> <td>=</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td colspan="2"></td> </tr> </tbody> </table>													OVERLAPS										Overlap Phase	Load Bays	Phases Overlapped	T.G. (s)	Y (s)	R (s)	-GY	+GRN			=										=										=										=									
OVERLAPS																																																																								
Overlap Phase	Load Bays	Phases Overlapped	T.G. (s)	Y (s)	R (s)	-GY	+GRN																																																																	
=																																																																								
=																																																																								
=																																																																								
=																																																																								
<p>PREPARED BY: JAM DATE: 07/01/14</p> <p>FLASH HOURS: 01:00 to 06:00 DAILY <input checked="" type="checkbox"/> NONE <input type="checkbox"/></p> <p>NIGHT FLASH: FY = M-102 (8 Mile) FR = SB and NB</p> <p>CONFLICT FLASH: FY = M-102 (8 Mile) FR = SB and NB</p> <p>CONTROLLER TYPE: <input checked="" type="checkbox"/> EPAC PRE-EMPT <input type="checkbox"/> <input type="checkbox"/> Other: COUNTDOWN PEDS <input checked="" type="checkbox"/></p> <p>LOCATION: M102 (8 Mile) EB @ X-over W. of Fair St.</p> <p>CITY/TWP: Detroit</p> <p>COUNTY : Wayne</p> <p>MILE POINT CONTROL SECTION-SPOT # 0.32 82143-01-115</p> <p>Job # (If Applicable):</p>																																																																								

CLEAR PAGE 1

CLEAR ALL

ADVANCED TIMING PARAMETERS FORM

SYSTEM INFORMATION	LEFT-TURN PHASING						RING AND BARRIER STRUCTURE											
Controller Type: <input checked="" type="checkbox"/> EPAC <input type="checkbox"/> Other:	Phase # / Description	<i>Permissive-Protected</i>		<i>Protected-Only</i>		R1	B1			B2			B3			B4		
	Phase 8/SB Crossover	Lead	Lag	Split	Lead		Lag	2	4	8								
		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R2											
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R3											
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	R4											
System Type: <input checked="" type="checkbox"/> Closed Loop <input type="checkbox"/> Stand By <input type="checkbox"/> Group 1 <input type="checkbox"/> Group 2 Address: <input type="checkbox"/> TBC <input type="checkbox"/> TBC/GPS <input type="checkbox"/> None <input type="checkbox"/> Other: If TBC, Synch by: <input type="checkbox"/> TOD <input type="checkbox"/> Event Interconnect Type: <input checked="" type="checkbox"/> Hardwire <input type="checkbox"/> Fiber-Optic <input type="checkbox"/> Radio <input type="checkbox"/> Phone Drop <input type="checkbox"/> None <input type="checkbox"/> Other: If Phone Drop, Phone # Controller Status: <input type="checkbox"/> Master <input checked="" type="checkbox"/> Slave <input type="checkbox"/> Isolated <input type="checkbox"/> TBC If Slave, Master Location: 175 S.D. @ M-102 Master Spot # : 82252-01-001	VEHICULAR AND PEDESTRIAN DETECTION												DISAPPEARING LEGEND CASE SIGNS					
	Approach		<i>Vehicular Detection</i>						<i>Pedestrian Detection</i>				Push-Button Crossing Locations					
			Movements and Call Delay (s)			Type												
			Left	Thru	Right	Loop	Video	Other										
	Southbound Crossover		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										
	Northbound Driveway		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										
ADDITIONAL DIAL SPLIT DATA												COORDINATION DATA						
PHASE		1	2	3	4	5	6	7	8	O1	O2	O3	Operation Mode	1				
DIAL	SPLIT	CYCLE											Coordination Mode	0				
DIAL	SPLIT	CYCLE											Maximum Mode	0				
DIAL	SPLIT	CYCLE											Correction Mode	3				
DIAL	SPLIT	CYCLE											Offset Mode	0				
DIAL	SPLIT	CYCLE											Force Mode	0				
DIAL	SPLIT	CYCLE											Max Dwell	0				
DIAL	SPLIT	CYCLE											Yield Period	0				
REMARKS:						ADDITIONAL OVERLAP DATA												
						Overlap Phase						Load Bays	Phases Overlapped	T.G. (s)	Y (s)	R (s)	-G/Y	+GRN
						=												
						=												
						=												
						PREPARED BY: JAM DATE: 07/01/14							LOCATION: M102 (8 Mile) EB @ X-over W. of Fair St.					
						<input checked="" type="checkbox"/> MDOT <input type="checkbox"/> County <input type="checkbox"/> City <input type="checkbox"/> Consultant							CONTROL SECTION-SPOT # 82143-01-115					

CLEAR PAGE 2

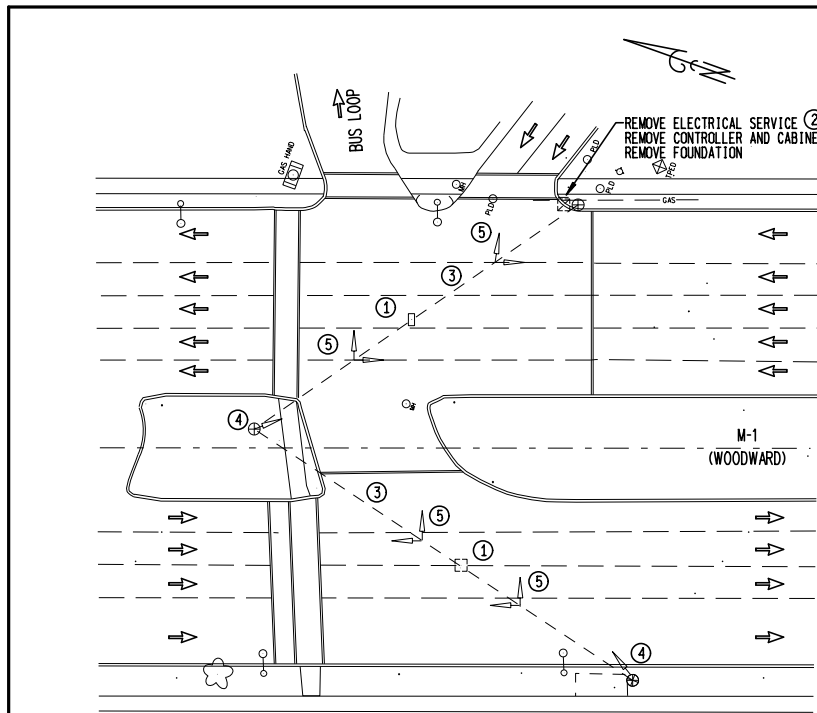
PREEMPTION INFORMATION FORM

Preemption Description:																	Preempt System Data												
Preempt # =	Time (s)	Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16											
SEL Ped Cl		Vehicle	Track																<input type="checkbox"/> Locking <input type="checkbox"/> Non-Locking	Delay (s) Extend (s)		Ring	1	2	3	4			
SEL Yellow			Dwell																	Duration (s) Max Call (s)		MIN							
SEL Red Cl			Cycle																	Lockout (s) Link PE #		GRN/WLK (s)							
TRACK Green		Ped	Exit																Delay (s) Extend (s)		Priority	PE/FL	PE1/2	PE2/3	PE3/4	PE4/5	PE5/6		
TRACK Ped Cl			Track																Duration (s) Max Call (s)		Status								
TRACK Yellow			Dwell																Lockout (s) Link PE #		REMARKS :								
TRACK Red CL		Cycle															Lockout (s) Link PE #												
DWELL Green		Overlap Vehicle	Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Lockout (s) Link PE #									
RET Ped Cl			Track																	Lockout (s) Link PE #									
RET Yellow			Dwell																	Lockout (s) Link PE #									
RET Red Cl		Cycle																	Lockout (s) Link PE #										
Preemption Description:																													
Preempt # =	Time (s)	Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16											
SEL Ped Cl		Vehicle	Track																<input type="checkbox"/> Locking <input type="checkbox"/> Non-Locking	Delay (s) Extend (s)		REMARKS :							
SEL Yellow			Dwell															Duration (s) Max Call (s)											
SEL Red Cl			Cycle															Lockout (s) Link PE #											
TRACK Green		Ped	Exit															Lockout (s) Link PE #											
TRACK Ped Cl			Track															Lockout (s) Link PE #											
TRACK Yellow			Dwell															Lockout (s) Link PE #											
TRACK Red CL		Cycle																Lockout (s) Link PE #											
DWELL Green		Overlap Vehicle	Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Lockout (s) Link PE #									
RET Ped Cl			Track																	Lockout (s) Link PE #									
RET Yellow			Dwell																	Lockout (s) Link PE #									
RET Red Cl		Cycle																	Lockout (s) Link PE #										
Preemption Description:																													
Preempt # =	Time (s)	Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16											
SEL Ped Cl		Vehicle	Track																<input type="checkbox"/> Locking <input type="checkbox"/> Non-Locking	Delay (s) Extend (s)		REMARKS :							
SEL Yellow			Dwell															Duration (s) Max Call (s)											
SEL Red Cl			Cycle															Lockout (s) Link PE #											
TRACK Green		Ped	Exit															Lockout (s) Link PE #											
TRACK Ped Cl			Track															Lockout (s) Link PE #											
TRACK Yellow			Dwell															Lockout (s) Link PE #											
TRACK Red CL		Cycle																Lockout (s) Link PE #											
DWELL Green		Overlap Vehicle	Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Lockout (s) Link PE #									
RET Ped Cl			Track																	Lockout (s) Link PE #									
RET Yellow			Dwell																	Lockout (s) Link PE #									
RET Red Cl		Cycle																	Lockout (s) Link PE #										
Preemption Description:																													
Preempt # =	Time (s)	Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16											
SEL Ped Cl		Vehicle	Track																<input type="checkbox"/> Locking <input type="checkbox"/> Non-Locking	Delay (s) Extend (s)		REMARKS :							
SEL Yellow			Dwell															Duration (s) Max Call (s)											
SEL Red Cl			Cycle															Lockout (s) Link PE #											
TRACK Green		Ped	Exit															Lockout (s) Link PE #											
TRACK Ped Cl			Track															Lockout (s) Link PE #											
TRACK Yellow			Dwell															Lockout (s) Link PE #											
TRACK Red CL		Cycle																Lockout (s) Link PE #											
DWELL Green		Overlap Vehicle	Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Lockout (s) Link PE #									
RET Ped Cl			Track																	Lockout (s) Link PE #									
RET Yellow			Dwell																	Lockout (s) Link PE #									
RET Red Cl		Cycle																	Lockout (s) Link PE #										

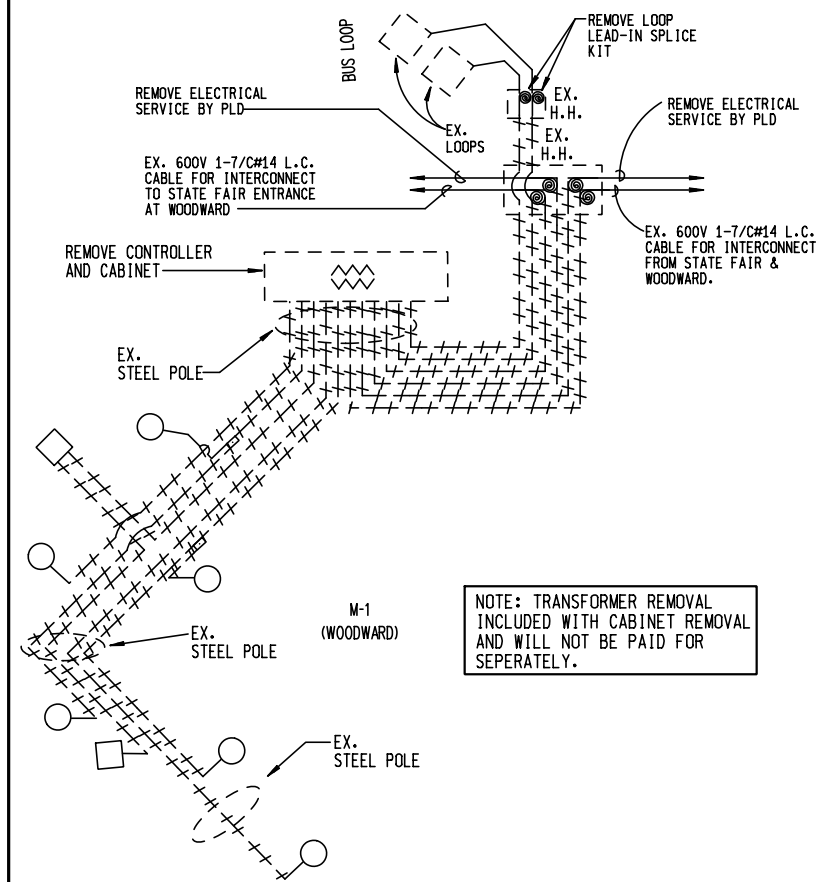
PREPARED BY: JAM DATE: 07/01/14

LOCATION:
M102 (8 Mile) EB @ X-over W. of Fair St.

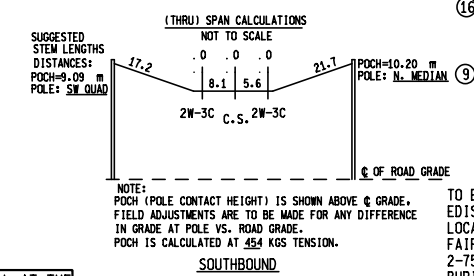
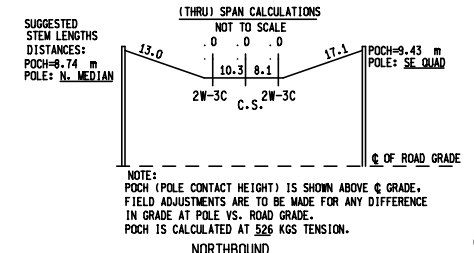
CONTROL SECTION-SPOT #
82143-01-115



REMOVAL DIAGRAM
NOT TO SCALE



REMOVAL WIRING DIAGRAM
NOT TO SCALE



CONTACT JUBI CHACKUNKAL AT THE CITY OF DETROIT TRAFFIC ENGINEERING (313) 267-7231 FOR STREET NAME SIGN REMOVAL.

CONTACT: DETROIT EDISON: LARRY JONES, (313) 235-2055 72 HOURS IN ADVANCE OF POWER ACTIVATION. NO COST TO CONTRACTOR. (SEE SHEET 16 FOR POWER)

FOR ELECTRICAL SERVICE INSPECTION CONTACT THE MICHIGAN DEPARTMENT OF LABOR AT 517-241-9320 COST TO CONTRACTOR WILL BE \$40.00.

CERTAIN PLD OWNED FACILITIES DEPICTED ON THESE PLANS MAY HAVE BEEN REMOVED OR RELOCATED IN CONJUNCTION WITH PROPOSED OR ACTUAL PLD IMPROVEMENTS.

NOTE: SPLIT WIRE TRAFFIC HEADS FOR INTERNAL CLEARANCE

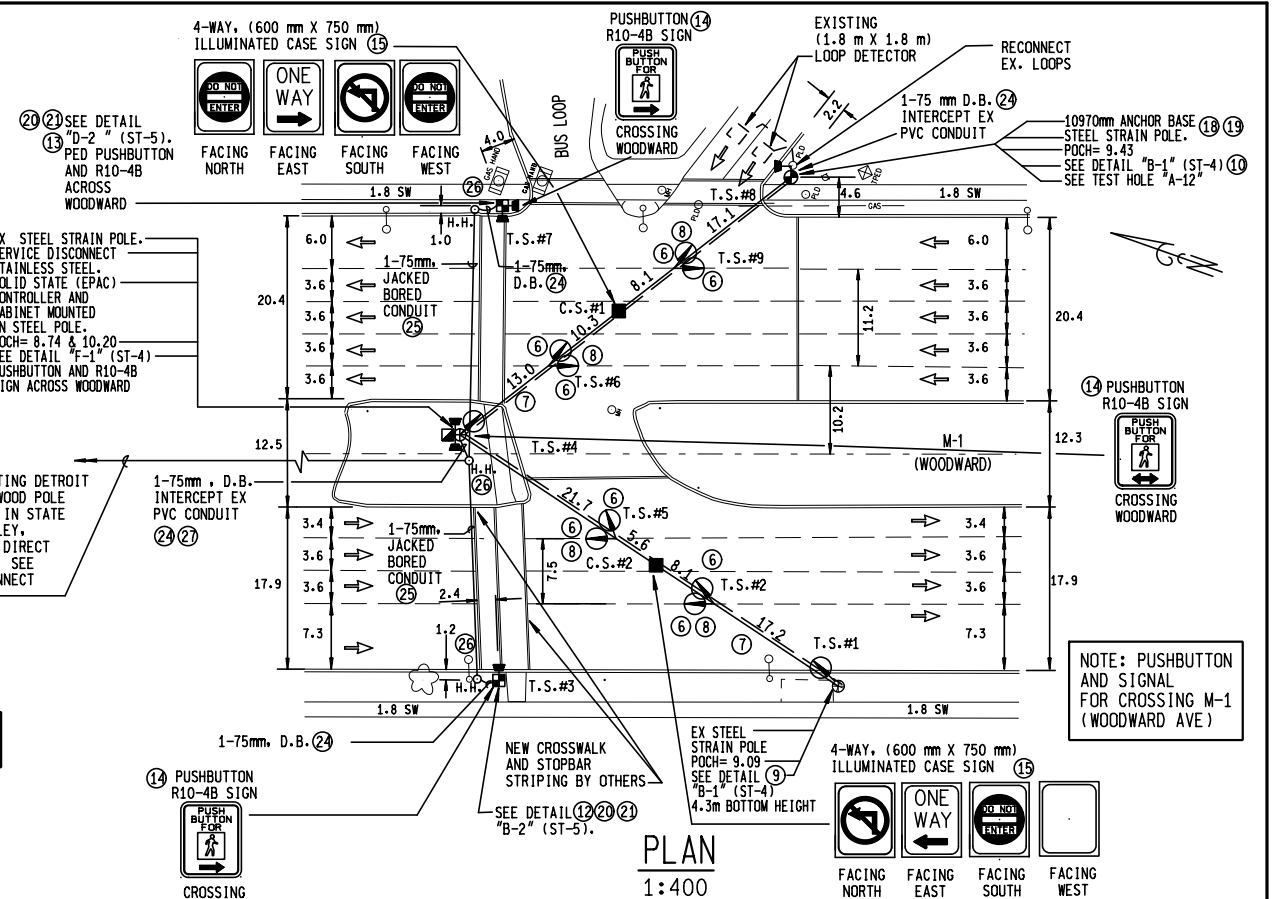
HAND DIG ENTIRE DEPTH OF ALL FOUNDATIONS

CAUTION: HIGH VOLTAGE & FIBER OPTIC CABLES MAY EXIST

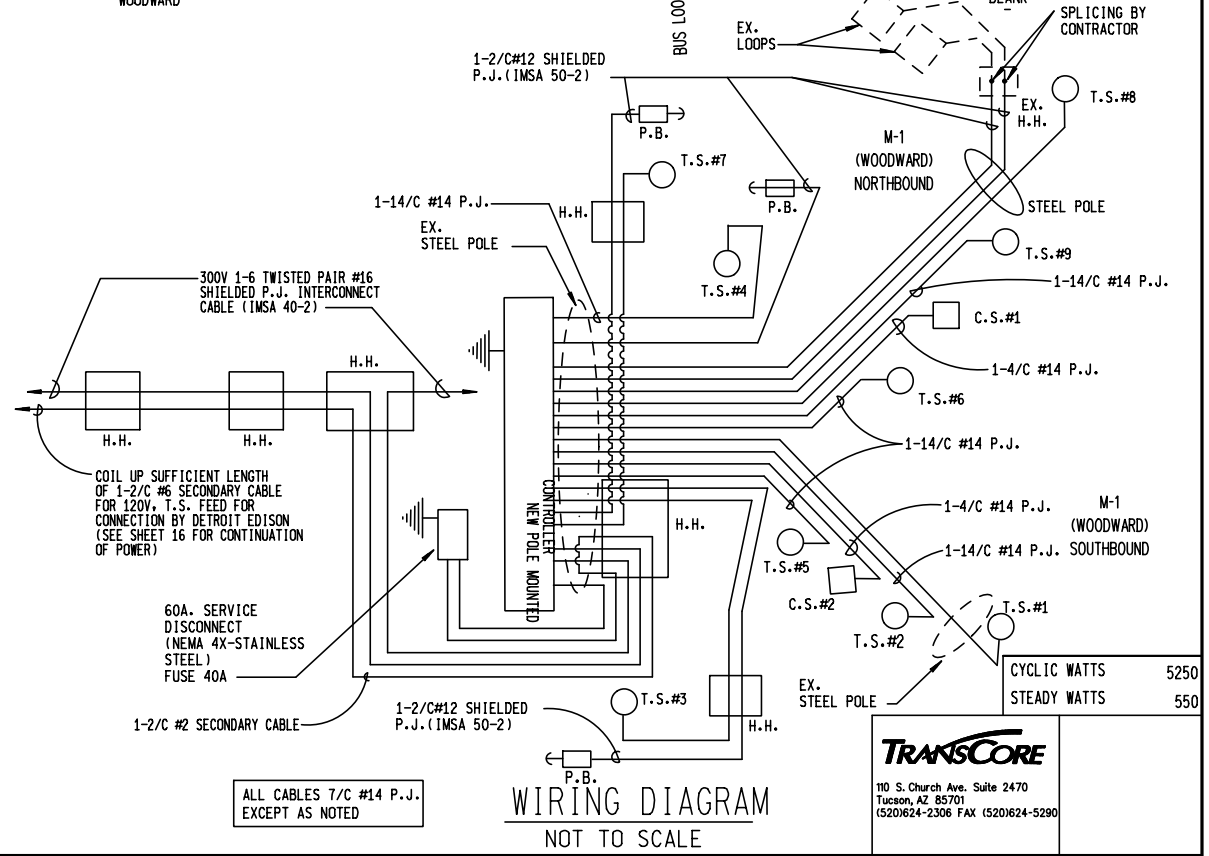
CONTACT: CITY OF DETROIT PUBLIC LIGHTING: KRIS ANALIL 313-267-7231 72 HOURS IN ADVANCE FOR REMOVAL OF INTERCONNECT AND ELECTRIC SERVICE.

LIST OF MATERIAL			
NO.	ITEM	QUANTITIES	ITEM CODE
1	Case Sign, Rem	2 Ea.	8200014
2	Controller and Cabinet, Rem	1 Ea.	8200017
3	Span Wire, Rem	2 Ea.	8200050
4	TS, Bracket Arm Mtd, Rem	2 Ea.	8200065
5	TS, Span Wire Mtd, Rem	4 Ea.	8200071
6	Louver	8 Ea.	8200200
7	Span Wire	2 Ea.	8200201
8	TS, 2 Way Span Wire Mtd	4 Ea.	8200230
9	TS, 1 Way Bracket Arm Mtd	2 Ea.	8200254
10	TS, Pedestrian, 1 Way Bracket Arm Mtd	1 Ea.	8200258
11	TS, Pedestrian, 2 Way Bracket Arm Mtd	1 Ea.	8200260
12	TS, Pedestrian, 1 Way Pedestal Mtd	1 Ea.	8200266
13	TS, Pedestrian, 2 Way Pedestal Mtd	1 Ea.	8200268
14	Pushbutton and Sign	3 Ea.	8200287
15	Case Sign, Four Way, 600 mm by 750 mm	2 Ea.	8200308
16	Controller and Cabinet, Solid State Actuated, Delivered	1 Ea.	8200330
17	Controller and Cabinet, Solid State Actuated	1 Ea.	8200334
18	Strain Pole, Steel, Anchor Base, 10970 mm	1 Ea.	8200414
19	Strain Pole, Fdn, Uncased	4m	8200420
20	Pedestal, Alum	2 Ea.	8200428
21	Pedestal, Fdn	2 Ea.	8200430
22	Serv Disconnect	1 Ea.	8200514
23	Unused		
24	Conduit, DB, 1, 75 mm	20m	8190064
25	Conduit, Jacked Bored	58m	8190100
26	Hh, Round	3 Ea.	8190347
27	Sec Cable, 600V, 1, 2/C#2	302m	8190420

All dimensions are in meters unless otherwise noted.



PLAN
1:400



WIRING DIAGRAM
NOT TO SCALE

TRANS-CORE
110 S. Church Ave. Suite 2470
Tucson, AZ 85701
(520)624-2306 FAX (520)624-5290

CONTROL SECTION	JOB NUMBER	FEDERAL NUMBERS		AUTH. NO.	DRAWN	DATE	CONST SHEET NO.
		PROJECT	ITEM				
82131	53109A			82131-01-045	KRH/SAL	08-00	M-1 (WOODWARD) AT BUS LOOP EXIT CITY OF DETROIT WAYNE COUNTY

TRAFFIC SIGNAL TIMING PERMIT

	PHASE	1	2	3	4	5	6	7	8			TIMING INSTALLED		
APPROACH												REMARKS		
MINIMUM GREEN														
PASSAGE														
MAXIMUM NO. 1														
MAXIMUM NO. 2														
YELLOW CHANGE														
RED CLEARANCE														
WALK														
PEDESTRIAN CLEARANCE														
EXTENDED PED. CLEARANCE														
NON-LOCK MEMORY														
DUAL ENTRY														
INITIALIZATION														
NON-ACT RESPONSE														
VEHICLE RECALL														
PEDESTRIAN RECALL														
	CYCLE									O1	O2		O3	PREPARED BY: _____ DATE: _____
DIAL	SPLIT													
DIAL	SPLIT													
DIAL	SPLIT													
DIAL	SPLIT													
DIAL	SPLIT													
	MODE												FLASH SCHEDULE DAILY NONE (TIME & DAY) NIGHT FLASH: CONFLICT FLASH: LOCATION: CITY/TWP: COUNTY :	
PHASE														
1														
2														
3														
4														
5														
6														
7										RR PRE-EMPT	MILE POINT	CONTROL SECTION-SPOT #		
8										FIRE PRE-EMPT				

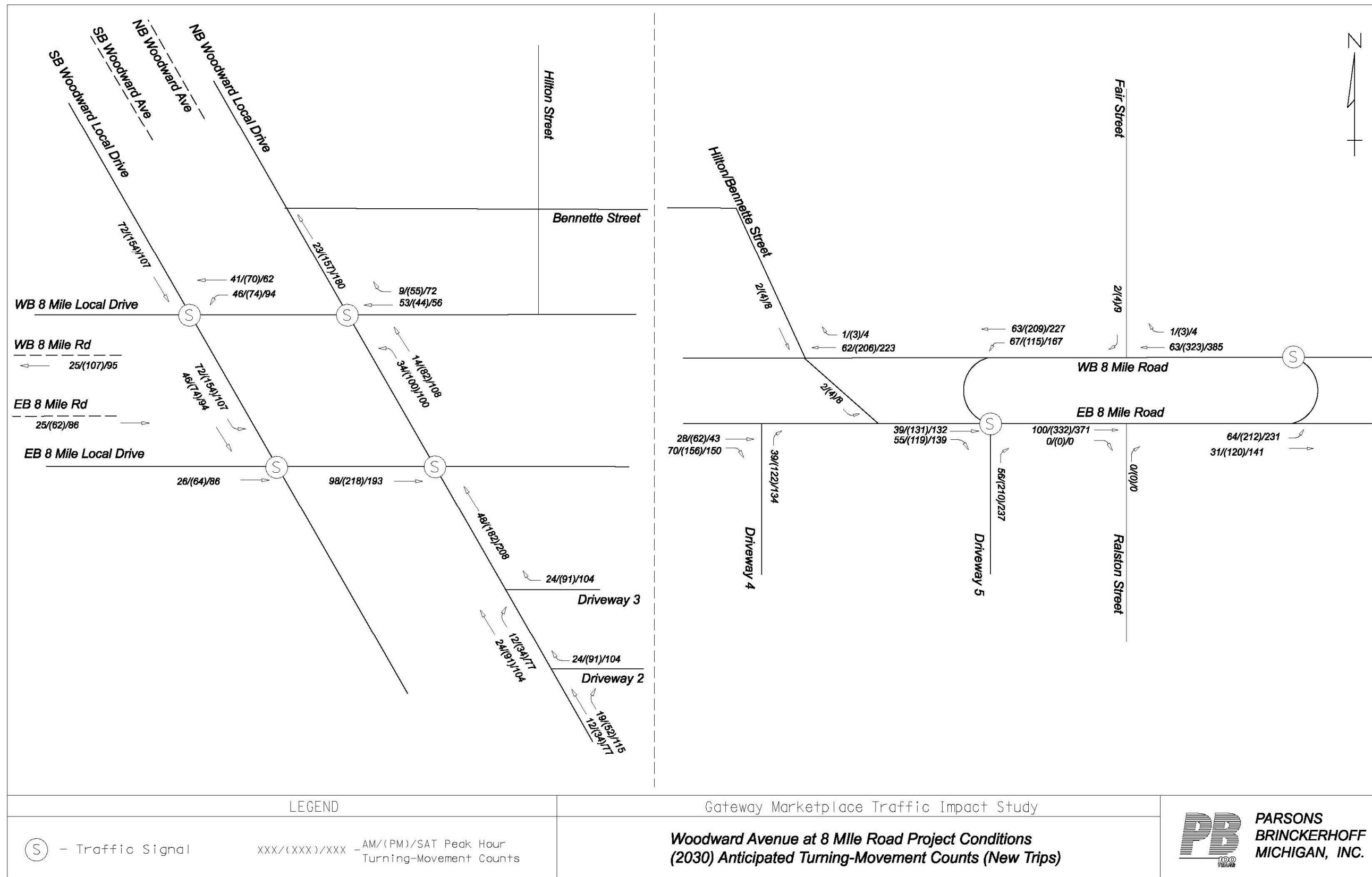
ADVANCED TIMING PARAMETERS FORM

SYSTEM INFORMATION		LEFT-TURN PHASING							RING AND BARRIER STRUCTURE (EPAC ONLY)																											
Phase # / Description		Permissive-Protected			Protected-Only				B1				B2				B3				B4															
		Lead	Lag		Split	Lead	Lag																													
<u>Controller Type:</u> EPIC EPAC EF140 Other:																																				
<u>System Type:</u> Closed Loop TBC None Other:		PHASE OVERLAPS (EPAC ONLY)														DISAPPEARING LEGEND CASE SIGNS																				
		Overlap Phase		Phases Overlapped				T.G. (s)	Y (s)	R (s)																										
		=																																		
		=																																		
		=																																		
		=																																		
If TBC, Synch by: TOD Event		VEHICULAR AND PEDESTRIAN DETECTION																																		
		Vehicular Detection							Pedestrian Detection																											
		Approach			Movements and Call Delay (s)				Type			Push-Button Crossing Locations																								
					Left	Thru	Right	Loop	Video	Other																										
<u>Interconnect Type:</u> Hardwire Fiber-Optic Radio Phone Drop None Other:																																				
If Phone Drop, Phone #		PREEMPTION INFORMATION																																		
		Preempt # =	Time (s)	Locking												Non-Locking																				
				Intervals/Phases			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24						
<u>Controller Status:</u> Master Slave Isolated TBC		SEL Ped CI	Vehicle	Track																																
				SEL Yellow	Vehicle	Dwell																														
						SEL Red CI	Vehicle	Cycle																												
								TRACK Green	Ped	Exit																										
If Slave, Master Location:		TRACK Ped CI	Ped	Track																																
				TRACK Yellow	Ped	Dwell																														
		TRACK Red CI	Ped			Cycle																														
				DWELL Green	Overlap Vehicle	Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X						
MCSS#: Reference #:		RET Ped CI	Overlap Vehicle	Track																																
		RET Yellow		Overlap Vehicle		Dwell																														
		RET Red CI				Overlap Vehicle	Cycle																													
Remarks:				Prepared by:						Date:						Location:																				
				MDOT			County			City			Consultant			City/Twp: County:																				
				Job # (If Applicable):						Mile Point						Control Section-Spot #																				

APPENDIX – C

Approved Gateway Marketplace Trips Figure

Figure 4-1: AM, PM, and Saturday Peak Hour New Trips



APPENDIX – D

MDOT Mode Split Correspondence

Mason Krushinsky

From: Ceifetz, Margaret (MDOT) <CeifetzM@michigan.gov>
Sent: Monday, June 29, 2020 12:48 PM
To: Christopher Prisk
Cc: Mark de La Vergne; Mason Krushinsky; Adefeso, Olukayode (MDOT); Scovitch, Greg; Sunny Jacob; Akinyemi@detroitmi.gov
Subject: RE: Modeshare for Project Panda

Hi Chris,

Thanks for passing this along. I've reviewed the material you sent over and the logic and methodology is sound but given the current social conditions and economic climate, I'm happy that you're willing to meet me in the middle and err on the slightly more conservative 10% modeshare value. Go ahead and move forward with 10%.

Best,
Maggie

From: Christopher Prisk <cprisk@Langan.com>
Sent: Wednesday, June 24, 2020 3:53 PM
To: Ceifetz, Margaret (MDOT) <CeifetzM@michigan.gov>
Cc: Mark de La Vergne <DLVergneM@detroitmi.gov>; Mason Krushinsky <mkrushinsky@langan.com>; Adefeso, Olukayode (MDOT) <AdefesoO@michigan.gov>; Scovitch, Greg <Greg.Scovitch@hillwood.com>; Sunny Jacob <sunjac@detroitmi.gov>; Akinyemi@detroitmi.gov
Subject: Modeshare for Project Panda

CAUTION: This is an External email. Please send suspicious emails to abuse@michigan.gov

Maggie,

You had requested to review the additional backup for the increased modeshare percentage instead of the conservative 5% we were initially showing. Please see email below.

After you review, let us know if you would be agreeable to increasing the modeshare percentage to 10% or more.

Thanks.

Christopher A. Prisk, P.E., PTOE
Senior Project Manager

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Subject: RE: [EXTERNAL] Modeshare for Project Panda

Hi Chris,

These numbers are pulled from the latest Census Bureau's American Community Survey, 2017.

The end user has HR on-site dedicated to providing transit/carpool information and myself who is dedicated to engaging with the transit agency to match bus schedules to shift schedules. We also ask the transit agencies to conduct tabling events once a quarter to supply transportation information to all associates.

I also provide GIS heat-mapping of applicant addresses to the transit agency once hiring begins so we can best understand from where the workforce is coming to better align bus routes for the associates.

Please let me know if this gives you the information you need.

Thank you,
Rebecca

From: Christopher Prisk <cprisk@Langan.com>

Sent: Monday, June 15, 2020 1:05 PM

Subject: RE: [EXTERNAL] Modeshare for Project Panda

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you can confirm the sender and know the content is safe.

Rebecca,

MDOT is asking for backup for the 19% mode split. Can we share the information provided in your email below? Do you have any other information we can provide to provide backup and justification?

Please let us know. Thanks.

Christopher A. Prisk, P.E., PTOE
Senior Project Manager

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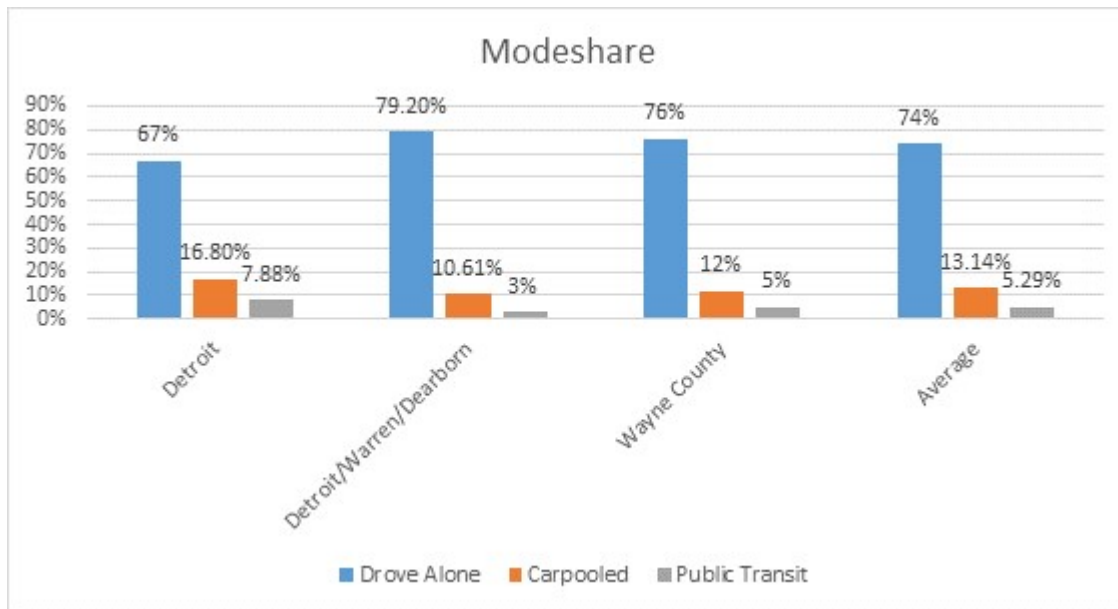
Subject: Modeshare for Project Panda

Hello,

Nationally, NAOps facilities tend to outperform county level averages for both carpool and transit use. With this in mind, expected modeshare for Project Panda is as detailed below.

- Detroit numbers are high with transit/carpool modeshare topping – 24.68%.
- The metro area Detroit/Warren/Dearborn have lower numbers at – 13.61%
- Wayne County is in between with transit/carpool modeshare at – 17%

Total Average for transit/carpool use is **18.43%** This data corroborates the 19% transit/carpool modeshare we discussed yesterday.



Please let me know if you need any further detail.

Thank you,
Rebecca

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APPENDIX – E

Level of Service Definitions

Table 1
Level of Service Criteria – Signalized Intersection

Level of Service	Description of Expected Traffic Delay	Signalized Stop Delay (sec/veh)
A	Little or None	≤ 10
B	Short	> 10 and ≤ 20
C	Average	> 20 and ≤ 35
D	Long	> 35 and ≤ 55
E	Very Long	> 55 and ≤ 80
F	Excessive	> 80

Source: Highway Capacity Manual (HCM), (2000 Edition).

Table 2
Level of Service Criteria – Unsignalized Intersection

Level of Service	Description of Expected Traffic Delay	Unsignalized Average Total Delay (sec/veh)
A	Little or None	≤ 10
B	Short	> 10 and ≤ 15
C	Average	> 15 and ≤ 25
D	Long	> 25 and ≤ 35
E	Very Long	> 35 and ≤ 50
F	Excessive	> 50

Source: Highway Capacity Manual (HCM), (2000 Edition).

The LOS criteria for TWSC intersections are somewhat different from the criteria used for signalized intersections primarily because different transportation facilities create different driver perceptions. The expectation is that a signalized intersection is designed to carry higher traffic volumes and experience greater delay than an unsignalized intersection.

APPENDIX – F

2020 Existing Capacity Analysis

HCM Signalized Intersection Capacity Analysis
 1015: Crossover/Driveway & WB M-102 [8 Mile Rd]













Project Panda
 2020 Existing - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					TTT		TT					T
Traffic Volume (vph)	0	0	0	0	2926	12	136	0	0	0	0	4
Future Volume (vph)	0	0	0	0	2926	12	136	0	0	0	0	4
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	11	12	14	14	14	11	11	11
Total Lost time (s)					5.3		5.2					5.7
Lane Util. Factor					0.86		0.97					1.00
Frt					1.00		1.00					0.86
Flt Protected					1.00		0.95					1.00
Satd. Flow (prot)					6516		3855					1640
Flt Permitted					1.00		0.95					1.00
Satd. Flow (perm)					6516		3855					1640
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	3180	13	148	0	0	0	0	4
RTOR Reduction (vph)	0	0	0	0	0	0	130	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	3193	0	19	0	0	0	0	4
Turn Type					NA		Prot					Prot
Protected Phases					6		3					4
Permitted Phases												
Actuated Green, G (s)					52.4		10.0					1.4
Effective Green, g (s)					52.4		10.0					1.4
Actuated g/C Ratio					0.65		0.12					0.02
Clearance Time (s)					5.3		5.2					5.7
Vehicle Extension (s)					3.0		3.0					3.0
Lane Grp Cap (vph)					4267		481					28
v/s Ratio Prot					c0.49		c0.00					c0.00
v/s Ratio Perm												
v/c Ratio					0.75		0.04					0.14
Uniform Delay, d1					9.3		30.8					38.7
Progression Factor					1.00		1.00					1.00
Incremental Delay, d2					1.2		0.0					2.3
Delay (s)					10.6		30.8					41.1
Level of Service					B		C					D
Approach Delay (s)		0.0			10.6			30.8			41.1	
Approach LOS		A			B			C			D	
Intersection Summary												
HCM 2000 Control Delay			11.5		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)				16.2			
Intersection Capacity Utilization			77.5%		ICU Level of Service					D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 1704: NB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]

Project Panda
 2020 Existing - AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↵	↕↑				
Traffic Volume (vph)	0	0	0	0	206	365	300	442	0	0	0	0
Future Volume (vph)	0	0	0	0	206	365	300	442	0	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	12	12	14	12	12	12	12	12
Total Lost time (s)					5.7		5.5	5.5				
Lane Util. Factor					0.91		0.91	0.91				
Flt					0.90		1.00	1.00				
Flt Protected					1.00		0.95	0.99				
Satd. Flow (prot)					4840		1808	3547				
Flt Permitted					1.00		0.95	0.99				
Satd. Flow (perm)					4840		1808	3547				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	224	397	326	480	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	311	0	93	13	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	310	0	168	532	0	0	0	0
Turn Type					NA		Split	NA				
Protected Phases					6		5	5				
Permitted Phases												
Actuated Green, G (s)					17.3		51.5	51.5				
Effective Green, g (s)					17.3		51.5	51.5				
Actuated g/C Ratio					0.22		0.64	0.64				
Clearance Time (s)					5.7		5.5	5.5				
Lane Grp Cap (vph)					1046		1163	2283				
v/s Ratio Prot					c0.06		0.09	c0.15				
v/s Ratio Perm												
v/c Ratio					0.30		0.14	0.23				
Uniform Delay, d1					26.3		5.6	6.0				
Progression Factor					1.99		0.16	0.42				
Incremental Delay, d2					0.5		0.2	0.2				
Delay (s)					52.9		1.1	2.8				
Level of Service					D		A	A				
Approach Delay (s)		0.0			52.9			2.2			0.0	
Approach LOS		A			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			24.3		HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio			0.25									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)			11.2				
Intersection Capacity Utilization			48.6%		ICU Level of Service			A				
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 1904: SB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2020 Existing - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑↑								↘	↙↑		
Traffic Volume (vph)	0	364	256	0	0	0	0	0	0	297	261	0	
Future Volume (vph)	0	364	256	0	0	0	0	0	0	297	261	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	11	11	11	12	12	12	12	12	12	16	14	14	
Total Lost time (s)		5.8								5.5	5.5		
Lane Util. Factor		0.91								0.91	0.91		
Frt		0.94								1.00	1.00		
Flt Protected		1.00								0.95	0.98		
Satd. Flow (prot)		4854								1921	3749		
Flt Permitted		1.00								0.95	0.98		
Satd. Flow (perm)		4854								1921	3749		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	396	278	0	0	0	0	0	0	323	284	0	
RTOR Reduction (vph)	0	158	0	0	0	0	0	0	0	40	40	0	
Lane Group Flow (vph)	0	516	0	0	0	0	0	0	0	157	370	0	
Turn Type		NA								Split	NA		
Protected Phases		12								11	11		
Permitted Phases													
Actuated Green, G (s)		18.2								50.5	50.5		
Effective Green, g (s)		18.2								50.5	50.5		
Actuated g/C Ratio		0.23								0.63	0.63		
Clearance Time (s)		5.8								5.5	5.5		
Lane Grp Cap (vph)		1104								1212	2366		
v/s Ratio Prot		c0.11								0.08	c0.10		
v/s Ratio Perm													
v/c Ratio		0.47								0.13	0.16		
Uniform Delay, d1		26.7								5.9	6.0		
Progression Factor		1.00								0.05	0.23		
Incremental Delay, d2		1.4								0.2	0.1		
Delay (s)		28.1								0.5	1.5		
Level of Service		C								A	A		
Approach Delay (s)		28.1			0.0			0.0			1.2		
Approach LOS		C			A			A			A		
Intersection Summary													
HCM 2000 Control Delay			15.4		HCM 2000 Level of Service						B		
HCM 2000 Volume to Capacity ratio			0.24										
Actuated Cycle Length (s)			80.0		Sum of lost time (s)					11.3			
Intersection Capacity Utilization			31.6%		ICU Level of Service					A			
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3945: NB M-1 [Woodward Ave] & Crossover/Site Driveway B

Project Panda
 2020 Existing - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↑↑↑↑				
Traffic Volume (vph)	0	0	0	0	16	17	0	980	33	0	0	0
Future Volume (vph)	0	0	0	0	16	17	0	980	33	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	16	16	16	12	12	12	12	12	12
Total Lost time (s)					9.0			5.7				
Lane Util. Factor					1.00			0.81				
Fr _t					0.93			1.00				
Fl _t Protected					1.00			1.00				
Satd. Flow (prot)					2068			7902				
Fl _t Permitted					1.00			1.00				
Satd. Flow (perm)					2068			7902				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	17	18	0	1065	36	0	0	0
RTOR Reduction (vph)	0	0	0	0	13	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	22	0	0	1095	0	0	0	0
Turn Type					NA			NA				
Protected Phases					4			2				
Permitted Phases												
Actuated Green, G (s)					23.0			52.3				
Effective Green, g (s)					23.0			52.3				
Actuated g/C Ratio					0.26			0.58				
Clearance Time (s)					9.0			5.7				
Lane Grp Cap (vph)					528			4591				
v/s Ratio Prot					c0.01			c0.14				
v/s Ratio Perm												
v/c Ratio					0.04			0.24				
Uniform Delay, d ₁					25.2			9.2				
Progression Factor					1.00			1.00				
Incremental Delay, d ₂					0.1			0.1				
Delay (s)					25.3			9.3				
Level of Service					C			A				
Approach Delay (s)		0.0			25.3			9.3			0.0	
Approach LOS		A			C			A			A	

Intersection Summary

HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.18		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.7
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3045: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2020 Existing - AM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰					↑↑↑↑
Traffic Volume (vph)	16	0	0	0	0	3725
Future Volume (vph)	16	0	0	0	0	3725
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	16	12	12	12	12	12
Total Lost time (s)	6.0					5.7
Lane Util. Factor	1.00					0.81
Frt	1.00					1.00
Flt Protected	0.95					1.00
Satd. Flow (prot)	2111					7941
Flt Permitted	0.95					1.00
Satd. Flow (perm)	2111					7941
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	0	0	0	0	4049
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	17	0	0	0	0	4049
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Actuated Green, G (s)	26.0					52.3
Effective Green, g (s)	26.0					52.3
Actuated g/C Ratio	0.29					0.58
Clearance Time (s)	6.0					5.7
Lane Grp Cap (vph)	609					4614
v/s Ratio Prot	c0.01					c0.51
v/s Ratio Perm						
v/c Ratio	0.03					0.88
Uniform Delay, d1	22.9					16.1
Progression Factor	0.32					1.00
Incremental Delay, d2	0.1					2.7
Delay (s)	7.5					18.8
Level of Service	A					B
Approach Delay (s)	7.5		0.0		18.8	
Approach LOS	A		A		B	

Intersection Summary			
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.7
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2944: NB M-1 [Woodward Ave] & Crossover/W State Fair Ave

Project Panda
 2020 Existing - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					←			↑↑↑↑					
Traffic Volume (vph)	0	0	0	0	79	154	0	859	48	0	0	0	
Future Volume (vph)	0	0	0	0	79	154	0	859	48	0	0	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	16	16	16	13	13	13	12	12	11	12	12	12	
Total Lost time (s)					8.8			5.2					
Lane Util. Factor					1.00			0.81					
Frbp, ped/bikes					0.99			1.00					
Flpb, ped/bikes					1.00			1.00					
Frt					0.91			0.99					
Flt Protected					1.00			1.00					
Satd. Flow (prot)					1810			7712					
Flt Permitted					1.00			1.00					
Satd. Flow (perm)					1810			7712					
Peak-hour factor, PHF	0.63	0.63	0.63	0.90	0.90	0.90	0.92	0.92	0.92	0.95	0.95	0.95	
Adj. Flow (vph)	0	0	0	0	88	171	0	934	52	0	0	0	
RTOR Reduction (vph)	0	0	0	0	59	0	0	8	0	0	0	0	
Lane Group Flow (vph)	0	0	0	0	200	0	0	978	0	0	0	0	
Confl. Peds. (#/hr)	5					5			23	23			
Confl. Bikes (#/hr)									1				
Heavy Vehicles (%)	0%	0%	0%	0%	0%	4%	0%	4%	4%	0%	0%	0%	
Turn Type					NA			NA					
Protected Phases					4			2					
Permitted Phases													
Actuated Green, G (s)					22.2			83.8					
Effective Green, g (s)					22.2			83.8					
Actuated g/C Ratio					0.18			0.70					
Clearance Time (s)					8.8			5.2					
Lane Grp Cap (vph)					334			5385					
v/s Ratio Prot					c0.11			c0.13					
v/s Ratio Perm													
v/c Ratio					0.60			0.18					
Uniform Delay, d1					44.8			6.3					
Progression Factor					1.00			1.00					
Incremental Delay, d2					7.7			0.1					
Delay (s)					52.6			6.3					
Level of Service					D			A					
Approach Delay (s)		0.0			52.6			6.3			0.0		
Approach LOS		A			D			A			A		
Intersection Summary													
HCM 2000 Control Delay			15.9		HCM 2000 Level of Service				B				
HCM 2000 Volume to Capacity ratio			0.27										
Actuated Cycle Length (s)			120.0		Sum of lost time (s)				14.0				
Intersection Capacity Utilization			58.7%		ICU Level of Service				B				
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
 2044: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2020 Existing - AM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶					↑↑↑↑
Traffic Volume (vph)	79	0	0	0	0	3741
Future Volume (vph)	79	0	0	0	0	3741
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	16	16	12	12	10	12
Total Lost time (s)	5.8					5.2
Lane Util. Factor	1.00					0.81
Frpb, ped/bikes	1.00					1.00
Flpb, ped/bikes	1.00					1.00
Fr _t	1.00					1.00
Fl _t Protected	0.95					1.00
Satd. Flow (prot)	2153					8020
Fl _t Permitted	0.95					1.00
Satd. Flow (perm)	2153					8020
Peak-hour factor, PHF	0.90	0.90	0.92	0.92	0.63	0.95
Adj. Flow (vph)	88	0	0	0	0	3938
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	88	0	0	0	0	3938
Confl. Peds. (#/hr)	5	5		23	23	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Actuated Green, G (s)	25.2					83.8
Effective Green, g (s)	25.2					83.8
Actuated g/C Ratio	0.21					0.70
Clearance Time (s)	5.8					5.2
Lane Grp Cap (vph)	452					5600
v/s Ratio Prot	c0.04					c0.49
v/s Ratio Perm						
v/c Ratio	0.19					0.70
Uniform Delay, d1	39.0					10.7
Progression Factor	0.25					0.33
Incremental Delay, d2	0.7					0.5
Delay (s)	10.4					4.1
Level of Service	B					A
Approach Delay (s)	10.4		0.0		4.1	
Approach LOS	B		A		A	
Intersection Summary						
HCM 2000 Control Delay			4.2		HCM 2000 Level of Service A	
HCM 2000 Volume to Capacity ratio			0.60			
Actuated Cycle Length (s)			120.0		Sum of lost time (s) 14.0	
Intersection Capacity Utilization			58.7%		ICU Level of Service B	
Analysis Period (min)			15			
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis
 9006: Ralston St/Site Driveway C & W State Fair Ave

Project Panda
 2020 Existing - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖			↗			↕			↕	
Traffic Volume (veh/h)	0	48	0	0	220	0	13	0	10	1	1	0
Future Volume (Veh/h)	0	48	0	0	220	0	13	0	10	1	1	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	52	0	0	239	0	14	0	11	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		772										
pX, platoon unblocked												
vC, conflicting volume	239			52			292	291	52	302	291	239
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	239			52			292	291	52	302	291	239
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	100	99	100	100	100
cM capacity (veh/h)	1328			1554			660	619	1016	643	619	800
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	52	239	25	2								
Volume Left	0	0	14	1								
Volume Right	0	0	11	0								
cSH	1328	1700	780	631								
Volume to Capacity	0.00	0.14	0.03	0.00								
Queue Length 95th (ft)	0	0	2	0								
Control Delay (s)	0.0	0.0	9.8	10.7								
Lane LOS			A	B								
Approach Delay (s)	0.0	0.0	9.8	10.7								
Approach LOS			A	B								
Intersection Summary												
Average Delay			0.8									
Intersection Capacity Utilization			21.0%		ICU Level of Service				A			
Analysis Period (min)			15									

Used pseudo SBL volume of 1 to generate delay for this movement.
 Used pseudo SBT volume of 1 to prevent fatal error from occurring in SimTraffic.

HCM Signalized Intersection Capacity Analysis
1059: John R St & W State Fair Ave

Project Panda
2020 Existing - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	35	4	25	118	21	12	72	19	12	99	10
Future Volume (vph)	8	35	4	25	118	21	12	72	19	12	99	10
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	10	11	11	10	12	12	10	12	12	10	12	12
Total Lost time (s)	5.9	5.9		5.9	5.9		5.3	5.3		5.3	5.3	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1365	1806		1773	1882		1623	1864		1627	1770	
Flt Permitted	0.64	1.00		0.73	1.00		0.68	1.00		0.69	1.00	
Satd. Flow (perm)	922	1806		1356	1882		1154	1864		1183	1770	
Peak-hour factor, PHF	0.83	0.83	0.83	0.76	0.76	0.76	0.89	0.89	0.89	0.86	0.86	0.86
Adj. Flow (vph)	10	42	5	33	155	28	13	81	21	14	115	12
RTOR Reduction (vph)	0	3	0	0	13	0	0	13	0	0	7	0
Lane Group Flow (vph)	10	44	0	33	170	0	13	89	0	14	120	0
Confl. Peds. (#/hr)	7					7	2					2
Heavy Vehicles (%)	29%	6%	0%	0%	4%	0%	9%	5%	0%	9%	10%	22%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	19.1	19.1		19.1	19.1		19.7	19.7		19.7	19.7	
Effective Green, g (s)	19.1	19.1		19.1	19.1		19.7	19.7		19.7	19.7	
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.39	0.39		0.39	0.39	
Clearance Time (s)	5.9	5.9		5.9	5.9		5.3	5.3		5.3	5.3	
Lane Grp Cap (vph)	352	689		517	718		454	734		466	697	
v/s Ratio Prot		0.02			c0.09			0.05			c0.07	
v/s Ratio Perm	0.01			0.02			0.01			0.01		
v/c Ratio	0.03	0.06		0.06	0.24		0.03	0.12		0.03	0.17	
Uniform Delay, d1	9.7	9.8		9.8	10.5		9.3	9.6		9.3	9.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.2		0.2	0.8		0.1	0.3		0.1	0.5	
Delay (s)	9.8	10.0		10.0	11.3		9.4	10.0		9.4	10.4	
Level of Service	A	A		B	B		A	A		A	B	
Approach Delay (s)		9.9			11.1			9.9			10.3	
Approach LOS		A			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			10.5				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.20									
Actuated Cycle Length (s)			50.0				Sum of lost time (s)				11.2	
Intersection Capacity Utilization			25.6%				ICU Level of Service				A	
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

Project Panda

1404: SB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]/WB M-102 [8 Mile Srv Rd]



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↙	↕						↕	↘
Traffic Volume (vph)	0	0	0	194	312	0	0	0	0	0	360	236
Future Volume (vph)	0	0	0	194	312	0	0	0	0	0	360	236
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	14	12	14	9	12	12	12	12	12	11	13
Total Lost time (s)				5.6	5.6						5.7	
Lane Util. Factor				0.91	0.91						0.91	
Flt				1.00	1.00						0.94	
Flt Protected				0.95	1.00						1.00	
Satd. Flow (prot)				1808	3197						4867	
Flt Permitted				0.95	1.00						1.00	
Satd. Flow (perm)				1808	3197						4867	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	211	339	0	0	0	0	0	391	257
RTOR Reduction (vph)	0	0	0	42	14	0	0	0	0	0	148	0
Lane Group Flow (vph)	0	0	0	135	359	0	0	0	0	0	500	0
Turn Type				Split	NA						NA	
Protected Phases				10	10						9	
Permitted Phases												
Actuated Green, G (s)				50.4	50.4						18.3	
Effective Green, g (s)				50.4	50.4						18.3	
Actuated g/C Ratio				0.63	0.63						0.23	
Clearance Time (s)				5.6	5.6						5.7	
Lane Grp Cap (vph)				1139	2014						1113	
v/s Ratio Prot				0.07	c0.11						c0.10	
v/s Ratio Perm												
v/c Ratio				0.12	0.18						0.45	
Uniform Delay, d1				5.9	6.2						26.5	
Progression Factor				1.45	1.12						1.00	
Incremental Delay, d2				0.2	0.2						1.3	
Delay (s)				8.8	7.1						27.8	
Level of Service				A	A						C	
Approach Delay (s)		0.0			7.6			0.0			27.8	
Approach LOS		A			A			A			C	
Intersection Summary												
HCM 2000 Control Delay			18.6		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.25									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)				11.3			
Intersection Capacity Utilization			31.6%		ICU Level of Service				A			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1804: NB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2020 Existing - AM Peak Hour















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	338	323	0	0	0	0	0	404	176	0	0	0
Future Volume (vph)	338	323	0	0	0	0	0	404	176	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	14	9	9	12	12	12	11	11	11	12	12	12
Total Lost time (s)	5.4	5.4						5.7				
Lane Util. Factor	0.91	0.91						0.91				
Frt	1.00	1.00						0.95				
Flt Protected	0.95	0.99						1.00				
Satd. Flow (prot)	1808	3168						4939				
Flt Permitted	0.95	0.99						1.00				
Satd. Flow (perm)	1808	3168						4939				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	367	351	0	0	0	0	0	439	191	0	0	0
RTOR Reduction (vph)	31	31	0	0	0	0	0	99	0	0	0	0
Lane Group Flow (vph)	204	452	0	0	0	0	0	531	0	0	0	0
Turn Type	Split	NA						NA				
Protected Phases	2	2						1				
Permitted Phases												
Actuated Green, G (s)	50.6	50.6						18.3				
Effective Green, g (s)	50.6	50.6						18.3				
Actuated g/C Ratio	0.63	0.63						0.23				
Clearance Time (s)	5.4	5.4						5.7				
Lane Grp Cap (vph)	1143	2003						1129				
v/s Ratio Prot	0.11	c0.14						c0.11				
v/s Ratio Perm												
v/c Ratio	0.18	0.23						0.47				
Uniform Delay, d1	6.1	6.3						26.7				
Progression Factor	0.28	0.40						1.00				
Incremental Delay, d2	0.3	0.2						1.4				
Delay (s)	2.0	2.8						28.1				
Level of Service	A	A						C				
Approach Delay (s)		2.5			0.0			28.1			0.0	
Approach LOS		A			A			C			A	
Intersection Summary												
HCM 2000 Control Delay			14.5					HCM 2000 Level of Service			B	
HCM 2000 Volume to Capacity ratio			0.29									
Actuated Cycle Length (s)			80.0					Sum of lost time (s)		11.2		
Intersection Capacity Utilization			42.0%					ICU Level of Service		A		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2915: Market Place Dr/Crossover & EB M-102 [8 Mile Rd]

Project Panda
 2020 Existing - AM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑↑↑	↗						↖↖	↘	↑		
Traffic Volume (vph)	0	2099	55	0	0	0	0	0	56	70	67	0	
Future Volume (vph)	0	2099	55	0	0	0	0	0	56	70	67	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	12	12	14	12	12	12	12	12	11	16	16	16	
Total Lost time (s)		6.2	6.2						6.0	6.0	6.0		
Lane Util. Factor		0.81	1.00						0.88	1.00	1.00		
Frt		1.00	0.85						0.85	1.00	1.00		
Flt Protected		1.00	1.00						1.00	0.95	1.00		
Satd. Flow (prot)		7941	1778						2836	2111	2222		
Flt Permitted		1.00	1.00						1.00	0.95	1.00		
Satd. Flow (perm)		7941	1778						2836	2111	2222		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	2282	60	0	0	0	0	0	61	76	73	0	
RTOR Reduction (vph)	0	0	16	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	2282	44	0	0	0	0	0	61	76	73	0	
Turn Type		NA	Prot						Prot	Split	NA		
Protected Phases		2 10	2 10						3	12	12		
Permitted Phases													
Actuated Green, G (s)		117.1	117.1						7.6	10.9	10.9		
Effective Green, g (s)		117.1	117.1						7.6	10.9	10.9		
Actuated g/C Ratio		0.73	0.73						0.05	0.07	0.07		
Clearance Time (s)									6.0	6.0	6.0		
Vehicle Extension (s)									3.0	3.0	3.0		
Lane Grp Cap (vph)		5811	1301						134	143	151		
v/s Ratio Prot		c0.29	0.02						c0.02	c0.04	0.03		
v/s Ratio Perm													
v/c Ratio		0.39	0.03						0.46	0.53	0.48		
Uniform Delay, d1		8.1	5.9						74.2	72.1	71.8		
Progression Factor		1.00	0.88						1.00	0.90	0.90		
Incremental Delay, d2		0.0	0.0						2.4	2.8	1.8		
Delay (s)		8.1	5.2						76.6	67.7	66.4		
Level of Service		A	A						E	E	E		
Approach Delay (s)		8.0			0.0			76.6			67.0		
Approach LOS		A			A			E			E		
Intersection Summary													
HCM 2000 Control Delay			13.1									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.41										
Actuated Cycle Length (s)			160.0									Sum of lost time (s)	24.4
Intersection Capacity Utilization			80.8%									ICU Level of Service	D
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
 4046: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2020 Existing - AM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶					↑↑↑↑
Traffic Volume (vph)	0	0	0	0	0	3725
Future Volume (vph)	0	0	0	0	0	3725
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Satd. Flow (prot)	2222	0	0	0	0	7941
Flt Permitted						
Satd. Flow (perm)	2222	0	0	0	0	7941
Link Speed (mph)	25		40			40
Link Distance (ft)	107		472			842
Travel Time (s)	2.9		8.0			14.4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	4049
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.0%
ICU Level of Service	A
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Delays on the major and minor streets should be 0 seconds as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
 4946: NB M-1 [Woodward Ave] & Crossover/State Fair Gate #5

Project Panda
 2020 Existing - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↑↑↑↑↔				
Traffic Volume (vph)	0	0	0	0	0	0	0	997	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	997	0	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	12	12
Satd. Flow (prot)	0	0	0	0	2222	0	0	7941	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	2222	0	0	7941	0	0	0	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		107			730			473			267	
Travel Time (s)		2.9			19.9			8.1			4.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	1084	0	0	0	0
Sign Control		Free			Stop			Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.0%
ICU Level of Service	A
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Delays on the major and minor streets should be 0 seconds as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

HCM Signalized Intersection Capacity Analysis
 1015: Crossover/Driveway & WB M-102 [8 Mile Rd]













Project Panda
 2020 Existing - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					TTT		TT					T
Traffic Volume (vph)	0	0	0	0	2652	4	303	0	0	0	0	11
Future Volume (vph)	0	0	0	0	2652	4	303	0	0	0	0	11
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	11	12	14	14	14	11	11	11
Total Lost time (s)					5.3		5.2					5.7
Lane Util. Factor					0.86		0.97					1.00
Frt					1.00		1.00					0.86
Flt Protected					1.00		0.95					1.00
Satd. Flow (prot)					6519		3855					1640
Flt Permitted					1.00		0.95					1.00
Satd. Flow (perm)					6519		3855					1640
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	2883	4	329	0	0	0	0	12
RTOR Reduction (vph)	0	0	0	0	0	0	288	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	2887	0	41	0	0	0	0	12
Turn Type					NA		Prot					Prot
Protected Phases					6		3					4
Permitted Phases												
Actuated Green, G (s)					52.3		10.0					1.5
Effective Green, g (s)					52.3		10.0					1.5
Actuated g/C Ratio					0.65		0.12					0.02
Clearance Time (s)					5.3		5.2					5.7
Vehicle Extension (s)					3.0		3.0					3.0
Lane Grp Cap (vph)					4261		481					30
v/s Ratio Prot					c0.44		c0.01					c0.01
v/s Ratio Perm												
v/c Ratio					0.68		0.09					0.40
Uniform Delay, d1					8.6		31.0					38.8
Progression Factor					1.00		1.00					1.00
Incremental Delay, d2					0.9		0.1					8.5
Delay (s)					9.5		31.0					47.3
Level of Service					A		C					D
Approach Delay (s)		0.0			9.5		31.0				47.3	
Approach LOS		A			A		C				D	
Intersection Summary												
HCM 2000 Control Delay			11.8		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)				16.2			
Intersection Capacity Utilization			78.5%		ICU Level of Service				D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 1704: NB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]

Project Panda
 2020 Existing - PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↔	↑↑				
Traffic Volume (vph)	0	0	0	0	164	436	443	579	0	0	0	0
Future Volume (vph)	0	0	0	0	164	436	443	579	0	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	12	12	14	12	12	12	12	12
Total Lost time (s)					5.7		5.5	5.5				
Lane Util. Factor					0.91		0.91	0.91				
Frt					0.89		1.00	1.00				
Flt Protected					1.00		0.95	0.99				
Satd. Flow (prot)					4769		1808	3540				
Flt Permitted					1.00		0.95	0.99				
Satd. Flow (perm)					4769		1808	3540				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	178	474	482	629	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	241	0	129	19	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	411	0	232	731	0	0	0	0
Turn Type					NA		Split	NA				
Protected Phases					6		5	5				
Permitted Phases												
Actuated Green, G (s)					17.3		51.5	51.5				
Effective Green, g (s)					17.3		51.5	51.5				
Actuated g/C Ratio					0.22		0.64	0.64				
Clearance Time (s)					5.7		5.5	5.5				
Lane Grp Cap (vph)					1031		1163	2278				
v/s Ratio Prot					c0.09		0.13	c0.21				
v/s Ratio Perm												
v/c Ratio					0.40		0.20	0.32				
Uniform Delay, d1					26.9		5.8	6.4				
Progression Factor					1.59		0.00	0.26				
Incremental Delay, d2					0.9		0.3	0.3				
Delay (s)					43.6		0.3	2.0				
Level of Service					D		A	A				
Approach Delay (s)		0.0			43.6			1.4			0.0	
Approach LOS		A			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			17.0		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.34									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)					11.2		
Intersection Capacity Utilization			56.5%		ICU Level of Service					B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 1904: SB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2020 Existing - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑↑								↘	↙↑		
Traffic Volume (vph)	0	446	172	0	0	0	0	0	0	399	253	0	
Future Volume (vph)	0	446	172	0	0	0	0	0	0	399	253	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	11	11	11	12	12	12	12	12	12	16	14	14	
Total Lost time (s)		5.8								5.5	5.5		
Lane Util. Factor		0.91								0.91	0.91		
Frt		0.96								1.00	1.00		
Flt Protected		1.00								0.95	0.98		
Satd. Flow (prot)		4959								1921	3727		
Flt Permitted		1.00								0.95	0.98		
Satd. Flow (perm)		4959								1921	3727		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	485	187	0	0	0	0	0	0	434	275	0	
RTOR Reduction (vph)	0	87	0	0	0	0	0	0	0	23	23	0	
Lane Group Flow (vph)	0	585	0	0	0	0	0	0	0	207	456	0	
Turn Type		NA								Split	NA		
Protected Phases		12								11	11		
Permitted Phases													
Actuated Green, G (s)		18.2								50.5	50.5		
Effective Green, g (s)		18.2								50.5	50.5		
Actuated g/C Ratio		0.23								0.63	0.63		
Clearance Time (s)		5.8								5.5	5.5		
Lane Grp Cap (vph)		1128								1212	2352		
v/s Ratio Prot		c0.12								0.11	c0.12		
v/s Ratio Perm													
v/c Ratio		0.52								0.17	0.19		
Uniform Delay, d1		27.1								6.1	6.2		
Progression Factor		1.00								0.09	0.21		
Incremental Delay, d2		1.7								0.3	0.2		
Delay (s)		28.8								0.8	1.4		
Level of Service		C								A	A		
Approach Delay (s)		28.8			0.0			0.0			1.2		
Approach LOS		C			A			A			A		
Intersection Summary													
HCM 2000 Control Delay			14.6		HCM 2000 Level of Service						B		
HCM 2000 Volume to Capacity ratio			0.28										
Actuated Cycle Length (s)			80.0		Sum of lost time (s)					11.3			
Intersection Capacity Utilization			34.5%		ICU Level of Service					A			
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3945: NB M-1 [Woodward Ave] & Crossover/Site Driveway B

Project Panda
 2020 Existing - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↑↑↑↑				
Traffic Volume (vph)	0	0	0	0	16	17	0	3578	33	0	0	0
Future Volume (vph)	0	0	0	0	16	17	0	3578	33	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	16	16	16	12	12	12	12	12	12
Total Lost time (s)					9.0			5.7				
Lane Util. Factor					1.00			0.81				
Fr _t					0.93			1.00				
Fl _t Protected					1.00			1.00				
Satd. Flow (prot)					2068			7930				
Fl _t Permitted					1.00			1.00				
Satd. Flow (perm)					2068			7930				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	17	18	0	3889	36	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	35	0	0	3923	0	0	0	0
Turn Type					NA			NA				
Protected Phases					4			2				
Permitted Phases												
Actuated Green, G (s)					23.0			62.3				
Effective Green, g (s)					23.0			62.3				
Actuated g/C Ratio					0.23			0.62				
Clearance Time (s)					9.0			5.7				
Lane Grp Cap (vph)					475			4940				
v/s Ratio Prot					c0.02			c0.49				
v/s Ratio Perm												
v/c Ratio					0.07			0.79				
Uniform Delay, d1					30.2			14.1				
Progression Factor					1.00			1.00				
Incremental Delay, d2					0.3			1.4				
Delay (s)					30.5			15.5				
Level of Service					C			B				
Approach Delay (s)		0.0			30.5			15.5			0.0	
Approach LOS		A			C			B			A	

Intersection Summary

HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.7
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3045: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2020 Existing - PM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶					↑↑↑↑
Traffic Volume (vph)	16	0	0	0	0	1513
Future Volume (vph)	16	0	0	0	0	1513
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	16	12	12	12	12	12
Total Lost time (s)	6.0					5.7
Lane Util. Factor	1.00					0.81
Frt	1.00					1.00
Flt Protected	0.95					1.00
Satd. Flow (prot)	2111					7941
Flt Permitted	0.95					1.00
Satd. Flow (perm)	2111					7941
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	0	0	0	0	1645
RTOR Reduction (vph)	13	0	0	0	0	0
Lane Group Flow (vph)	4	0	0	0	0	1645
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Actuated Green, G (s)	26.0					62.3
Effective Green, g (s)	26.0					62.3
Actuated g/C Ratio	0.26					0.62
Clearance Time (s)	6.0					5.7
Lane Grp Cap (vph)	548					4947
v/s Ratio Prot	c0.00					c0.21
v/s Ratio Perm						
v/c Ratio	0.01					0.33
Uniform Delay, d1	27.4					9.0
Progression Factor	0.00					1.00
Incremental Delay, d2	0.0					0.2
Delay (s)	0.0					9.1
Level of Service	A					A
Approach Delay (s)	0.0		0.0		9.1	
Approach LOS	A		A		A	

Intersection Summary

HCM 2000 Control Delay	9.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.7
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2944: NB M-1 [Woodward Ave] & Crossover/W State Fair Ave

Project Panda
 2020 Existing - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					1			4					
Traffic Volume (vph)	0	0	0	0	78	162	0	3449	80	0	0	0	
Future Volume (vph)	0	0	0	0	78	162	0	3449	80	0	0	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	16	16	16	13	13	13	12	12	11	12	12	12	
Total Lost time (s)					8.8			5.2					
Lane Util. Factor					1.00			0.81					
Frbp, ped/bikes					0.99			1.00					
Flpb, ped/bikes					1.00			1.00					
Frt					0.91			1.00					
Flt Protected					1.00			1.00					
Satd. Flow (prot)					1787			7988					
Flt Permitted					1.00			1.00					
Satd. Flow (perm)					1787			7988					
Peak-hour factor, PHF	0.50	0.50	0.50	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	0	0	0	0	84	174	0	3631	84	0	0	0	
RTOR Reduction (vph)	0	0	0	0	1	0	0	3	0	0	0	0	
Lane Group Flow (vph)	0	0	0	0	257	0	0	3712	0	0	0	0	
Confl. Peds. (#/hr)	5					5			23	23			
Confl. Bikes (#/hr)									1				
Heavy Vehicles (%)	0%	0%	0%	1%	1%	5%	0%	1%	0%	0%	0%	0%	
Turn Type					NA			NA					
Protected Phases					4			2					
Permitted Phases													
Actuated Green, G (s)					22.2			83.8					
Effective Green, g (s)					22.2			83.8					
Actuated g/C Ratio					0.18			0.70					
Clearance Time (s)					8.8			5.2					
Lane Grp Cap (vph)					330			5578					
v/s Ratio Prot					c0.14			c0.46					
v/s Ratio Perm													
v/c Ratio					0.78			0.67					
Uniform Delay, d1					46.6			10.2					
Progression Factor					1.00			1.00					
Incremental Delay, d2					16.5			0.6					
Delay (s)					63.1			10.8					
Level of Service					E			B					
Approach Delay (s)		0.0			63.1			10.8			0.0		
Approach LOS		A			E			B			A		
Intersection Summary													
HCM 2000 Control Delay			14.2		HCM 2000 Level of Service				B				
HCM 2000 Volume to Capacity ratio			0.69										
Actuated Cycle Length (s)			120.0		Sum of lost time (s)				14.0				
Intersection Capacity Utilization			64.4%		ICU Level of Service				C				
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
 2044: SB M-1 [Woodward Ave] & Crossover

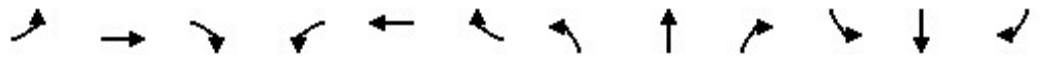
Project Panda
 2020 Existing - PM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶					↷↷↷↷
Traffic Volume (vph)	78	0	0	0	0	1513
Future Volume (vph)	78	0	0	0	0	1513
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	16	16	12	12	10	12
Total Lost time (s)	5.8					5.2
Lane Util. Factor	1.00					0.81
Frpb, ped/bikes	1.00					1.00
Flpb, ped/bikes	1.00					1.00
Fr t	1.00					1.00
Fl t Protected	0.95					1.00
Satd. Flow (prot)	2132					7941
Fl t Permitted	0.95					1.00
Satd. Flow (perm)	2132					7941
Peak-hour factor, PHF	0.95	0.95	0.92	0.92	0.50	0.95
Adj. Flow (vph)	82	0	0	0	0	1593
RTOR Reduction (vph)	37	0	0	0	0	0
Lane Group Flow (vph)	45	0	0	0	0	1593
Confl. Peds. (#/hr)	5	5		23	23	
Heavy Vehicles (%)	1%	0%	0%	0%	0%	2%
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Actuated Green, G (s)	25.2					83.8
Effective Green, g (s)	25.2					83.8
Actuated g/C Ratio	0.21					0.70
Clearance Time (s)	5.8					5.2
Lane Grp Cap (vph)	447					5545
v/s Ratio Prot	c0.02					c0.20
v/s Ratio Perm						
v/c Ratio	0.10					0.29
Uniform Delay, d1	38.3					6.8
Progression Factor	0.00					0.51
Incremental Delay, d2	0.3					0.1
Delay (s)	0.3					3.6
Level of Service	A					A
Approach Delay (s)	0.3		0.0		3.6	
Approach LOS	A		A		A	
Intersection Summary						
HCM 2000 Control Delay	3.4			HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio	0.25					
Actuated Cycle Length (s)	120.0			Sum of lost time (s)		14.0
Intersection Capacity Utilization	64.4%			ICU Level of Service		C
Analysis Period (min)	15					
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis
 9006: Ralston St/Site Driveway C & W State Fair Ave

Project Panda
 2020 Existing - PM Peak Hour























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖			↗			↕			↕	
Traffic Volume (veh/h)	0	80	0	0	222	0	18	0	11	1	1	0
Future Volume (Veh/h)	0	80	0	0	222	0	18	0	11	1	1	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	87	0	0	241	0	20	0	12	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		772										
pX, platoon unblocked												
vC, conflicting volume	241			87			328	328	87	340	328	241
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	241			87			328	328	87	340	328	241
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	99	100	100	100
cM capacity (veh/h)	1326			1509			624	591	971	606	591	798
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	87	241	32	2								
Volume Left	0	0	20	1								
Volume Right	0	0	12	0								
cSH	1326	1700	721	598								
Volume to Capacity	0.00	0.14	0.04	0.00								
Queue Length 95th (ft)	0	0	3	0								
Control Delay (s)	0.0	0.0	10.2	11.0								
Lane LOS			B	B								
Approach Delay (s)	0.0	0.0	10.2	11.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.0									
Intersection Capacity Utilization			21.1%		ICU Level of Service				A			
Analysis Period (min)			15									

Used pseudo SBL volume of 1 to generate delay for this movement.
 Used pseudo SBT volume of 1 to prevent fatal error from occurring in SimTraffic.

HCM Signalized Intersection Capacity Analysis
1059: John R St & W State Fair Ave

Project Panda
2020 Existing - PM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	14	83	10	64	227	50	43	199	58	47	139	23	
Future Volume (vph)	14	83	10	64	227	50	43	199	58	47	139	23	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	10	11	11	10	12	12	10	12	12	10	12	12	
Total Lost time (s)	5.9	5.9		5.9	5.9		5.3	5.3		5.3	5.3		
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Frt	1.00	0.98		1.00	0.97		1.00	0.97		1.00	0.98		
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1542	1886		1773	1908		1612	1894		1772	1898		
Flt Permitted	0.55	1.00		0.69	1.00		0.64	1.00		0.56	1.00		
Satd. Flow (perm)	892	1886		1289	1908		1082	1894		1053	1898		
Peak-hour factor, PHF	0.90	0.90	0.90	0.88	0.88	0.88	0.88	0.88	0.88	0.85	0.85	0.85	
Adj. Flow (vph)	16	92	11	73	258	57	49	226	66	55	164	27	
RTOR Reduction (vph)	0	7	0	0	16	0	0	21	0	0	12	0	
Lane Group Flow (vph)	16	96	0	73	299	0	49	271	0	55	179	0	
Confl. Peds. (#/hr)									1	1			
Heavy Vehicles (%)	15%	1%	0%	0%	2%	2%	10%	2%	0%	0%	2%	10%	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA		
Protected Phases		4			8			2			6		
Permitted Phases	4			8			2			6			
Actuated Green, G (s)	19.1	19.1		19.1	19.1		19.7	19.7		19.7	19.7		
Effective Green, g (s)	19.1	19.1		19.1	19.1		19.7	19.7		19.7	19.7		
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.39	0.39		0.39	0.39		
Clearance Time (s)	5.9	5.9		5.9	5.9		5.3	5.3		5.3	5.3		
Lane Grp Cap (vph)	340	720		492	728		426	746		414	747		
v/s Ratio Prot		0.05			c0.16			c0.14			0.09		
v/s Ratio Perm	0.02			0.06			0.05			0.05			
v/c Ratio	0.05	0.13		0.15	0.41		0.12	0.36		0.13	0.24		
Uniform Delay, d1	9.7	10.1		10.1	11.3		9.6	10.7		9.7	10.1		
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	0.3	0.4		0.6	1.7		0.5	1.4		0.7	0.8		
Delay (s)	10.0	10.4		10.8	13.0		10.2	12.1		10.4	10.9		
Level of Service	A	B		B	B		B	B		B	B		
Approach Delay (s)		10.4			12.6			11.8			10.8		
Approach LOS		B			B			B			B		
Intersection Summary													
HCM 2000 Control Delay			11.7									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.39										
Actuated Cycle Length (s)			50.0									Sum of lost time (s)	11.2
Intersection Capacity Utilization			49.6%									ICU Level of Service	A
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

Project Panda

1404: SB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]/WB M-102 [8 Mile Srv Rd]



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↙	↕						↕	↘
Traffic Volume (vph)	0	0	0	194	413	0	0	0	0	0	458	278
Future Volume (vph)	0	0	0	194	413	0	0	0	0	0	458	278
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	14	12	14	9	12	12	12	12	12	11	13
Total Lost time (s)				5.6	5.6						5.7	
Lane Util. Factor				0.91	0.91						0.91	
Fr _t				1.00	1.00						0.94	
Fl _t Protected				0.95	1.00						1.00	
Satd. Flow (prot)				1808	3205						4882	
Fl _t Permitted				0.95	1.00						1.00	
Satd. Flow (perm)				1808	3205						4882	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	211	449	0	0	0	0	0	498	302
RTOR Reduction (vph)	0	0	0	22	14	0	0	0	0	0	137	0
Lane Group Flow (vph)	0	0	0	168	456	0	0	0	0	0	663	0
Turn Type				Split	NA						NA	
Protected Phases				10	10						9	
Permitted Phases												
Actuated Green, G (s)				50.4	50.4						18.3	
Effective Green, g (s)				50.4	50.4						18.3	
Actuated g/C Ratio				0.63	0.63						0.23	
Clearance Time (s)				5.6	5.6						5.7	
Lane Grp Cap (vph)				1139	2019						1116	
v/s Ratio Prot				0.09	c0.14						c0.14	
v/s Ratio Perm												
v/c Ratio				0.15	0.23						0.59	
Uniform Delay, d ₁				6.0	6.4						27.5	
Progression Factor				0.82	0.81						1.00	
Incremental Delay, d ₂				0.3	0.2						2.3	
Delay (s)				5.2	5.4						29.9	
Level of Service				A	A						C	
Approach Delay (s)		0.0			5.3			0.0			29.9	
Approach LOS		A			A			A			C	
Intersection Summary												
HCM 2000 Control Delay			18.8		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.32									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)				11.3			
Intersection Capacity Utilization			34.5%		ICU Level of Service				A			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1804: NB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2020 Existing - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	382	463	0	0	0	0	0	640	152	0	0	0
Future Volume (vph)	382	463	0	0	0	0	0	640	152	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	14	9	9	12	12	12	11	11	11	12	12	12
Total Lost time (s)	5.4	5.4						5.7				
Lane Util. Factor	0.91	0.91						0.91				
Frt	1.00	1.00						0.97				
Flt Protected	0.95	0.99						1.00				
Satd. Flow (prot)	1808	3182						5026				
Flt Permitted	0.95	0.99						1.00				
Satd. Flow (perm)	1808	3182						5026				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	415	503	0	0	0	0	0	696	165	0	0	0
RTOR Reduction (vph)	14	14	0	0	0	0	0	49	0	0	0	0
Lane Group Flow (vph)	285	605	0	0	0	0	0	812	0	0	0	0
Turn Type	Split	NA						NA				
Protected Phases	2	2						1				
Permitted Phases												
Actuated Green, G (s)	50.6	50.6						18.3				
Effective Green, g (s)	50.6	50.6						18.3				
Actuated g/C Ratio	0.63	0.63						0.23				
Clearance Time (s)	5.4	5.4						5.7				
Lane Grp Cap (vph)	1143	2012						1149				
v/s Ratio Prot	0.16	c0.19						c0.16				
v/s Ratio Perm												
v/c Ratio	0.25	0.30						0.71				
Uniform Delay, d1	6.4	6.7						28.4				
Progression Factor	0.40	0.42						1.00				
Incremental Delay, d2	0.5	0.4						3.7				
Delay (s)	3.1	3.2						32.0				
Level of Service	A	A						C				
Approach Delay (s)		3.2			0.0			32.0			0.0	
Approach LOS		A			A			C			A	
Intersection Summary												
HCM 2000 Control Delay			17.1					HCM 2000 Level of Service			B	
HCM 2000 Volume to Capacity ratio			0.41									
Actuated Cycle Length (s)			80.0					Sum of lost time (s)		11.2		
Intersection Capacity Utilization			49.8%					ICU Level of Service		A		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2915: Market Place Dr/Crossover & EB M-102 [8 Mile Rd]

Project Panda
 2020 Existing - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑↑↑	↗						↖↖	↘	↑		
Traffic Volume (vph)	0	2612	119	0	0	0	0	0	210	64	115	0	
Future Volume (vph)	0	2612	119	0	0	0	0	0	210	64	115	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	12	12	14	12	12	12	12	12	11	16	16	16	
Total Lost time (s)		6.2	6.2						6.0	6.0	6.0		
Lane Util. Factor		0.81	1.00						0.88	1.00	1.00		
Frt		1.00	0.85						0.85	1.00	1.00		
Flt Protected		1.00	1.00						1.00	0.95	1.00		
Satd. Flow (prot)		7941	1778						2836	2111	2222		
Flt Permitted		1.00	1.00						1.00	0.95	1.00		
Satd. Flow (perm)		7941	1778						2836	2111	2222		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	2839	129	0	0	0	0	0	228	70	125	0	
RTOR Reduction (vph)	0	0	41	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	2839	88	0	0	0	0	0	228	70	125	0	
Turn Type		NA	Prot						Prot	Split	NA		
Protected Phases		2 10	2 10						3	12	12		
Permitted Phases													
Actuated Green, G (s)		108.8	108.8						14.0	12.8	12.8		
Effective Green, g (s)		108.8	108.8						14.0	12.8	12.8		
Actuated g/C Ratio		0.68	0.68						0.09	0.08	0.08		
Clearance Time (s)									6.0	6.0	6.0		
Vehicle Extension (s)									3.0	3.0	3.0		
Lane Grp Cap (vph)		5399	1209						248	168	177		
v/s Ratio Prot		c0.36	0.05						c0.08	0.03	c0.06		
v/s Ratio Perm													
v/c Ratio		0.53	0.07						0.92	0.42	0.71		
Uniform Delay, d1		12.8	8.6						72.4	70.0	71.8		
Progression Factor		0.97	1.14						1.00	0.96	0.96		
Incremental Delay, d2		0.1	0.0						35.7	1.3	9.9		
Delay (s)		12.4	9.9						108.1	68.7	78.6		
Level of Service		B	A						F	E	E		
Approach Delay (s)		12.3			0.0			108.1				75.0	
Approach LOS		B			A			F				E	
Intersection Summary													
HCM 2000 Control Delay			22.4									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.58										
Actuated Cycle Length (s)			160.0									Sum of lost time (s)	24.4
Intersection Capacity Utilization			84.5%									ICU Level of Service	E
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
4046: SB M-1 [Woodward Ave] & Crossover

Project Panda
2020 Existing - PM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶					↑↑↑↑
Traffic Volume (vph)	0	0	0	0	0	1513
Future Volume (vph)	0	0	0	0	0	1513
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Satd. Flow (prot)	2222	0	0	0	0	7941
Flt Permitted						
Satd. Flow (perm)	2222	0	0	0	0	7941
Link Speed (mph)	25		40			40
Link Distance (ft)	125		503			811
Travel Time (s)	3.4		8.6			13.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	1645
Sign Control	Stop		Free			Free

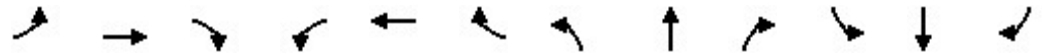
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	49.6%
ICU Level of Service	A
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Delays on the major and minor streets should be 0 seconds as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
 4946: NB M-1 [Woodward Ave] & Crossover/State Fair Gate #5

Project Panda
 2020 Existing - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↑↑↑↑↔				
Traffic Volume (vph)	0	0	0	0	0	0	0	3595	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	3595	0	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	12	12
Satd. Flow (prot)	0	0	0	0	2222	0	0	7941	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	2222	0	0	7941	0	0	0	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		125			680			473			267	
Travel Time (s)		3.4			18.5			8.1			4.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	3908	0	0	0	0
Sign Control		Free			Stop			Free			Free	
















Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	49.6%
ICU Level of Service	A
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Delays on the major and minor streets should be 0 seconds as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
 1015: Crossover/Driveway & WB M-102 [8 Mile Rd]

Project Panda
 2020 Existing - AM Peak Hour




















												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	11	12	14	14	14	11	11	11
Storage Length (ft)	0		0	325		0	0		0	0		0
Storage Lanes	0		0	0		0	2		0	0		1
Taper Length (ft)	25			100			25			25		
Right Turn on Red			Yes			Yes	Yes		Yes			No
Link Speed (mph)		40			40			25				25
Link Distance (ft)		667			2329			73				286
Travel Time (s)		11.4			39.7			2.0				7.8
Lane Group Flow (vph)	0	0	0	0	3193	0	148	0	0	0	0	4
v/c Ratio					0.69		0.18					0.03
Control Delay					8.4		1.5					34.0
Queue Delay					0.0		0.0					0.0
Total Delay					8.4		1.5					34.0
Queue Length 50th (ft)					184		1					2
Queue Length 95th (ft)					399		6					11
Internal Link Dist (ft)		587			2249			1				206
Turn Bay Length (ft)												
Base Capacity (vph)					4638		862					211
Starvation Cap Reductn					0		0					0
Spillback Cap Reductn					0		0					0
Storage Cap Reductn					0		0					0
Reduced v/c Ratio					0.69		0.17					0.02
Intersection Summary												
Area Type:	Other											



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	14	12	12	12	12	12
Storage Length (ft)	325			0	0	0
Storage Lanes	2			0	0	0
Taper Length (ft)	25				25	
Link Speed (mph)		40	40		40	
Link Distance (ft)		669	2304		73	
Travel Time (s)		11.4	39.3		1.2	
Lane Group Flow (vph)	148	2271	0	0	0	0
Intersection Summary						
Area Type:	Other					













Lanes, Volumes, Timings
 1704: NB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]

Project Panda
 2020 Existing - AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  		 	 				
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	12	12	14	12	12	12	12	12
Storage Length (ft)	0		0	875		0	90		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		174			1335			234				818
Travel Time (s)		3.0			22.8			4.0				13.9
Lane Group Flow (vph)	0	0	0	0	621	0	261	545	0	0	0	0
v/c Ratio					0.46		0.21	0.24				
Control Delay					20.2		0.5	2.6				
Queue Delay					0.0		0.5	0.4				
Total Delay					20.2		1.0	3.0				
Queue Length 50th (ft)					63		0	27				
Queue Length 95th (ft)					102		3	32				
Internal Link Dist (ft)		94			1255			154				738
Turn Bay Length (ft)							90					
Base Capacity (vph)					1357		1256	2296				
Starvation Cap Reductn					0		623	1199				
Spillback Cap Reductn					0		0	0				
Storage Cap Reductn					0		0	0				
Reduced v/c Ratio					0.46		0.41	0.50				
Intersection Summary												
Area Type:	Other											

Lanes, Volumes, Timings
 1904: SB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2020 Existing - AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑								↘	↙↑	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	11	11	11	12	12	12	12	12	12	16	14	14
Storage Length (ft)	0		900	0		0	0		0	90		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Link Speed (mph)		40			40			40			40	
Link Distance (ft)		1309			166			808			245	
Travel Time (s)		22.3			2.8			13.8			4.2	
Lane Group Flow (vph)	0	674	0	0	0	0	0	0	0	197	410	0
v/c Ratio		0.53								0.16	0.17	
Control Delay		20.3								0.3	1.2	
Queue Delay		0.0								0.5	0.3	
Total Delay		20.3								0.9	1.5	
Queue Length 50th (ft)		73								1	8	
Queue Length 95th (ft)		110								1	7	
Internal Link Dist (ft)		1229			86			728			165	
Turn Bay Length (ft)										90		
Base Capacity (vph)		1262								1252	2406	
Starvation Cap Reductn		0								723	1397	
Spillback Cap Reductn		0								0	0	
Storage Cap Reductn		0								0	0	
Reduced v/c Ratio		0.53								0.37	0.41	
Intersection Summary												
Area Type:	Other											

Lanes, Volumes, Timings
 3945: NB M-1 [Woodward Ave] & Crossover/Site Driveway B

Project Panda
 2020 Existing - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	16	16	16	12	12	12	12	12	12
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		30			25			40				40
Link Distance (ft)		98			1019			842				473
Travel Time (s)		2.2			27.8			14.4				8.1
Lane Group Flow (vph)	0	0	0	0	35	0	0	1101	0	0	0	0
v/c Ratio					0.06			0.24				
Control Delay					16.4			9.2				
Queue Delay					0.0			0.0				
Total Delay					16.4			9.2				
Queue Length 50th (ft)					7			68				
Queue Length 95th (ft)					30			83				
Internal Link Dist (ft)		18			939			762				393
Turn Bay Length (ft)												
Base Capacity (vph)					542			4597				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			0				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.06			0.24				

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 3045: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2020 Existing - AM Peak Hour



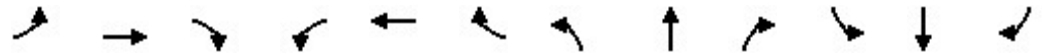
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Right Turn on Red	Yes	Yes		Yes		
Link Speed (mph)	25		40			40
Link Distance (ft)	98		813			472
Travel Time (s)	2.7		13.9			8.0
Lane Group Flow (vph)	17	0	0	0	0	4049
v/c Ratio	0.03					0.88
Control Delay	7.6					19.0
Queue Delay	0.0					0.0
Total Delay	7.6					19.0
Queue Length 50th (ft)	4					450
Queue Length 95th (ft)	5					494
Internal Link Dist (ft)	18		733			392
Turn Bay Length (ft)						
Base Capacity (vph)	609					4614
Starvation Cap Reductn	0					0
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.03					0.88

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 2944: NB M-1 [Woodward Ave] & Crossover/W State Fair Ave

Project Panda
 2020 Existing - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	16	16	13	13	13	12	12	11	12	12	12
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		25			25			40				40
Link Distance (ft)		76			772			1032				842
Travel Time (s)		2.1			21.1			17.6				14.4
Lane Group Flow (vph)	0	0	0	0	259	0	0	986	0	0	0	0
v/c Ratio					0.66			0.18				
Control Delay					41.4			6.2				
Queue Delay					0.0			0.0				
Total Delay					41.4			6.2				
Queue Length 50th (ft)					136			56				
Queue Length 95th (ft)					229			67				
Internal Link Dist (ft)		1			692			952				762
Turn Bay Length (ft)												
Base Capacity (vph)					393			5392				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			0				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.66			0.18				

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 2044: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2020 Existing - AM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	16	12	12	10	12
Storage Length (ft)	30	0		0	0	
Storage Lanes	0	0		0	0	
Taper Length (ft)	25				25	
Right Turn on Red	Yes	Yes		Yes		
Link Speed (mph)	25		40			40
Link Distance (ft)	76		1017			813
Travel Time (s)	2.1		17.3			13.9
Lane Group Flow (vph)	88	0	0	0	0	3938
v/c Ratio	0.19					0.70
Control Delay	10.5					11.6
Queue Delay	0.0					0.2
Total Delay	10.5					11.8
Queue Length 50th (ft)	16					401
Queue Length 95th (ft)	m16					424
Internal Link Dist (ft)	1		937			733
Turn Bay Length (ft)	30					
Base Capacity (vph)	452					5600
Starvation Cap Reductn	0					613
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.19					0.79

Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.

Intersection												
Int Delay, s/veh	0.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	48	0	0	220	0	13	0	10	1	1	0
Future Vol, veh/h	0	48	0	0	220	0	13	0	10	1	1	0
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	52	0	0	239	0	14	0	11	1	1	0

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	239	0	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	-
Pot Cap-1 Maneuver	1328	-	0	0
Stage 1	-	-	0	0
Stage 2	-	-	0	0
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1328	-	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-





















Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	9.8	10.7
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	778	1328	-	-	-	633
HCM Lane V/C Ratio	0.032	-	-	-	-	0.003
HCM Control Delay (s)	9.8	0	-	-	-	10.7
HCM Lane LOS	A	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	-	0

Used pseudo SBL volume of 1 to display delay for that turning movement.
 Used pseudo SBT volume of 1 to prevent fatal error from occurring in SimTraffic.

Lanes, Volumes, Timings
1059: John R St & W State Fair Ave

Project Panda
2020 Existing - AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	10	11	11	10	12	12	10	12	12	10	12	12
Storage Length (ft)	50		0	50		0	70		0	70		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1146			1401			1021			1264	
Travel Time (s)		26.0			31.8			23.2			28.7	
Lane Group Flow (vph)	10	47	0	33	183	0	13	102	0	14	127	0
v/c Ratio	0.03	0.07		0.06	0.25		0.03	0.14		0.03	0.18	
Control Delay	10.0	9.4		10.3	10.4		9.6	8.7		9.6	9.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.0	9.4		10.3	10.4		9.6	8.7		9.6	9.9	
Queue Length 50th (ft)	2	7		6	31		2	14		2	21	
Queue Length 95th (ft)	8	21		16	53		10	37		10	45	
Internal Link Dist (ft)		1066			1321			941			1184	
Turn Bay Length (ft)	50			50			70			70		
Base Capacity (vph)	352	692		517	731		455	747		466	705	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.03	0.07		0.06	0.25		0.03	0.14		0.03	0.18	
Intersection Summary												
Area Type:	Other											

Lanes, Volumes, Timings

1404: SB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]/WB M-102 [8 Mile Srv Rd]



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	14	12	14	9	12	12	12	12	12	11	13
Storage Length (ft)	0		0	110		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		1243			174			245				469
Travel Time (s)		21.2			3.0			4.2				8.0
Lane Group Flow (vph)	0	0	0	177	373	0	0	0	0	0	648	0
v/c Ratio				0.15	0.18							0.51
Control Delay				3.5	6.3							20.3
Queue Delay				1.2	0.9							0.0
Total Delay				4.8	7.2							20.3
Queue Length 50th (ft)				0	35							71
Queue Length 95th (ft)				24	56							106
Internal Link Dist (ft)		1163			94			165				389
Turn Bay Length (ft)				110								
Base Capacity (vph)				1181	2027							1261
Starvation Cap Reductn				808	1344							0
Spillback Cap Reductn				0	0							0
Storage Cap Reductn				0	0							0
Reduced v/c Ratio				0.47	0.55							0.51

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 1804: NB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2020 Existing - AM Peak Hour















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	14	9	9	12	12	12	11	11	11	12	12	12
Storage Length (ft)	110		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		166			1056			1294				234
Travel Time (s)		2.8			18.0			22.1				4.0
Lane Group Flow (vph)	235	483	0	0	0	0	0	630	0	0	0	0
v/c Ratio	0.20	0.24						0.51				
Control Delay	1.5	2.4						22.9				
Queue Delay	1.0	0.6						0.0				
Total Delay	2.5	3.0						22.9				
Queue Length 50th (ft)	6	18						79				
Queue Length 95th (ft)	20	25						114				
Internal Link Dist (ft)		86			976			1214				154
Turn Bay Length (ft)	110											
Base Capacity (vph)	1174	2036						1229				
Starvation Cap Reductn	702	1135						0				
Spillback Cap Reductn	0	0						0				
Storage Cap Reductn	0	0						0				
Reduced v/c Ratio	0.50	0.54						0.51				

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 2915: Market Place Dr/Crossover & EB M-102 [8 Mile Rd]

Project Panda
 2020 Existing - AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑	↗						↖↖	↘	↑	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	14	12	12	12	12	12	11	16	16	16
Storage Length (ft)	0		280	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		2	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			No	No		Yes
Link Speed (mph)		40			40			25				40
Link Distance (ft)		385			669			327				71
Travel Time (s)		6.6			11.4			8.9				1.2
Lane Group Flow (vph)	0	2282	60	0	0	0	0	0	61	76	73	0
v/c Ratio		0.38	0.04						0.38	0.53	0.48	
Control Delay		4.4	0.8						79.4	74.4	72.1	
Queue Delay		0.0	0.0						0.0	0.0	0.0	
Total Delay		4.4	0.8						79.4	74.4	72.1	
Queue Length 50th (ft)		83	0						35	78	75	
Queue Length 95th (ft)		124	6						64	m107	m101	
Internal Link Dist (ft)		305			589			247				1
Turn Bay Length (ft)			280									
Base Capacity (vph)		6400	1444						248	184	194	
Starvation Cap Reductn		0	0						0	0	0	
Spillback Cap Reductn		0	0						0	0	0	
Storage Cap Reductn		0	0						0	0	0	
Reduced v/c Ratio		0.36	0.04						0.25	0.41	0.38	

Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	16	12	12	12
Storage Length (ft)		0	230		0	0
Storage Lanes		0	2		0	0
Taper Length (ft)			25		25	
Link Speed (mph)	40			40	40	
Link Distance (ft)	330			667	71	
Travel Time (s)	5.6			11.4	1.2	
Lane Group Flow (vph)	0	0	149	3184	0	0

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 4046: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2020 Existing - AM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶					↑↑↑↑
Traffic Volume (vph)	0	0	0	0	0	3725
Future Volume (vph)	0	0	0	0	0	3725
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Satd. Flow (prot)	2222	0	0	0	0	7941
Flt Permitted						
Satd. Flow (perm)	2222	0	0	0	0	7941
Link Speed (mph)	25		40			40
Link Distance (ft)	107		472			842
Travel Time (s)	2.9		8.0			14.4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	4049
Sign Control	Stop		Free			Free

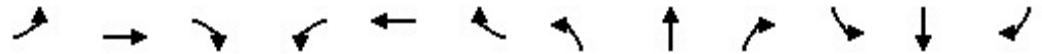
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.0%
ICU Level of Service	A
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Queues on the major and minor streets should be 0 FT as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
 4946: NB M-1 [Woodward Ave] & Crossover/State Fair Gate #5

Project Panda
 2020 Existing - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↑↑↑↑↔				
Traffic Volume (vph)	0	0	0	0	0	0	0	997	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	997	0	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	12	12
Satd. Flow (prot)	0	0	0	0	2222	0	0	7941	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	2222	0	0	7941	0	0	0	0
Link Speed (mph)		25			25			40				40
Link Distance (ft)		107			730			473				267
Travel Time (s)		2.9			19.9			8.1				4.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	1084	0	0	0	0
Sign Control		Free			Stop			Free			Free	
















Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.0%
ICU Level of Service	A
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Queues on the major and minor streets should be 0 FT as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
1015: Crossover/Driveway & WB M-102 [8 Mile Rd]

Project Panda
2020 Existing - PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	11	12	14	14	14	11	11	11
Storage Length (ft)	0		0	325		0	0		0	0		0
Storage Lanes	0		0	0		0	2		0	0		1
Taper Length (ft)	25			100			25			25		
Right Turn on Red			Yes			Yes	Yes		Yes			No
Link Speed (mph)		40			40			25				25
Link Distance (ft)		693			2329			96				286
Travel Time (s)		11.8			39.7			2.6				7.8
Lane Group Flow (vph)	0	0	0	0	2887	0	332	0	0	0	0	12
v/c Ratio					0.62		0.41					0.08
Control Delay					7.5		7.1					34.9
Queue Delay					0.0		0.0					0.0
Total Delay					7.5		7.1					34.9
Queue Length 50th (ft)					151		2					6
Queue Length 95th (ft)					336		m22					21
Internal Link Dist (ft)		613			2249			16				206
Turn Bay Length (ft)												
Base Capacity (vph)					4635		837					211
Starvation Cap Reductn					0		0					0
Spillback Cap Reductn					0		0					0
Storage Cap Reductn					0		0					0
Reduced v/c Ratio					0.62		0.40					0.06

Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
 1915: EB M-102 [8 Mile Rd] & Crossover




















Project Panda
 2020 Existing - PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	14	12	12	12	12	12
Storage Length (ft)	325			0	0	0
Storage Lanes	2			0	0	0
Taper Length (ft)	25				25	
Link Speed (mph)		40	40		40	
Link Distance (ft)		692	2304		96	
Travel Time (s)		11.8	39.3		1.6	
Lane Group Flow (vph)	332	2805	0	0	0	0
Intersection Summary						
Area Type:	Other					

Lanes, Volumes, Timings
 1704: NB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]

Project Panda
 2020 Existing - PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  		 	 				
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	12	12	14	12	12	12	12	12
Storage Length (ft)	0		0	875		0	90		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		174			1335			234				818
Travel Time (s)		3.0			22.8			4.0				13.9
Lane Group Flow (vph)	0	0	0	0	652	0	361	750	0	0	0	0
v/c Ratio					0.51		0.28	0.33				
Control Delay					23.9		0.5	1.9				
Queue Delay					0.0		0.7	0.7				
Total Delay					23.9		1.1	2.6				
Queue Length 50th (ft)					81		1	25				
Queue Length 95th (ft)					112		m0	28				
Internal Link Dist (ft)		94			1255			154				738
Turn Bay Length (ft)							90					
Base Capacity (vph)					1271		1292	2297				
Starvation Cap Reductn					0		590	1125				
Spillback Cap Reductn					0		0	0				
Storage Cap Reductn					0		0	0				
Reduced v/c Ratio					0.51		0.51	0.64				













Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
 1904: SB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2020 Existing - PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑								↘	↙↑	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	11	11	11	12	12	12	12	12	12	16	14	14
Storage Length (ft)	0		900	0		0	0		0	90		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		1292			166			808				245
Travel Time (s)		22.0			2.8			13.8				4.2
Lane Group Flow (vph)	0	672	0	0	0	0	0	0	0	230	479	0
v/c Ratio		0.55								0.19	0.20	
Control Delay		24.5								0.6	1.3	
Queue Delay		0.0								0.8	0.4	
Total Delay		24.5								1.4	1.8	
Queue Length 50th (ft)		90								1	9	
Queue Length 95th (ft)		127								2	9	
Internal Link Dist (ft)		1212			86			728				165
Turn Bay Length (ft)										90		
Base Capacity (vph)		1214								1235	2375	
Starvation Cap Reductn		0								721	1377	
Spillback Cap Reductn		0								0	0	
Storage Cap Reductn		0								0	0	
Reduced v/c Ratio		0.55								0.45	0.48	
Intersection Summary												
Area Type:	Other											

Lanes, Volumes, Timings
 3945: NB M-1 [Woodward Ave] & Crossover/Site Driveway B

Project Panda
 2020 Existing - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	16	16	16	12	12	12	12	12	12
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		30			25			40				40
Link Distance (ft)		98			1019			842				473
Travel Time (s)		2.2			27.8			14.4				8.1
Lane Group Flow (vph)	0	0	0	0	35	0	0	3925	0	0	0	0
v/c Ratio					0.07			0.79				
Control Delay					30.8			15.6				
Queue Delay					0.0			0.0				
Total Delay					30.8			15.6				
Queue Length 50th (ft)					18			421				
Queue Length 95th (ft)					43			458				
Internal Link Dist (ft)		18			939			762				393
Turn Bay Length (ft)												
Base Capacity (vph)					475			4943				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			0				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.07			0.79				

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 3045: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2020 Existing - PM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Right Turn on Red	Yes	Yes		Yes		
Link Speed (mph)	25		40			40
Link Distance (ft)	98		813			503
Travel Time (s)	2.7		13.9			8.6
Lane Group Flow (vph)	17	0	0	0	0	1645
v/c Ratio	0.03					0.33
Control Delay	0.1					9.2
Queue Delay	0.0					0.0
Total Delay	0.1					9.2
Queue Length 50th (ft)	0					112
Queue Length 95th (ft)	0					130
Internal Link Dist (ft)	18		733			423
Turn Bay Length (ft)						
Base Capacity (vph)	571					4947
Starvation Cap Reductn	0					0
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.03					0.33

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 2944: NB M-1 [Woodward Ave] & Crossover/W State Fair Ave

Project Panda
 2020 Existing - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	16	16	13	13	13	12	12	11	12	12	12
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		25			25			40				40
Link Distance (ft)		76			772			1032				842
Travel Time (s)		2.1			21.1			17.6				14.4
Lane Group Flow (vph)	0	0	0	0	258	0	0	3715	0	0	0	0
v/c Ratio					0.78			0.67				
Control Delay					63.6			10.9				
Queue Delay					0.0			0.0				
Total Delay					63.6			10.9				
Queue Length 50th (ft)					191			359				
Queue Length 95th (ft)					#318			381				
Internal Link Dist (ft)		1			692			952				762
Turn Bay Length (ft)												
Base Capacity (vph)					331			5583				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			0				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.78			0.67				

Intersection Summary

Area Type: Other
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
 2044: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2020 Existing - PM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	16	12	12	10	12
Storage Length (ft)	30	0		0	0	
Storage Lanes	0	0		0	0	
Taper Length (ft)	25				25	
Right Turn on Red	Yes	Yes		Yes		
Link Speed (mph)	25		40			40
Link Distance (ft)	76		1017			813
Travel Time (s)	2.1		17.3			13.9
Lane Group Flow (vph)	82	0	0	0	0	1609
v/c Ratio	0.17					0.29
Control Delay	0.5					7.0
Queue Delay	0.0					0.0
Total Delay	0.5					7.0
Queue Length 50th (ft)	0					104
Queue Length 95th (ft)	m0					118
Internal Link Dist (ft)	1		937			733
Turn Bay Length (ft)	30					
Base Capacity (vph)	483					5545
Starvation Cap Reductn	0					0
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.17					0.29

Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↗			↕			↕	
Traffic Vol, veh/h	0	80	0	0	222	0	18	0	11	1	1	0
Future Vol, veh/h	0	80	0	0	222	0	18	0	11	1	1	0
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	87	0	0	241	0	20	0	12	1	1	0

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	241	0	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	-
Pot Cap-1 Maneuver	1326	-	0	0
Stage 1	-	-	0	0
Stage 2	-	-	0	0
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1326	-	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-





















Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	10.2	11
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	721	1326	-	-	-	602
HCM Lane V/C Ratio	0.044	-	-	-	-	0.004
HCM Control Delay (s)	10.2	0	-	-	-	11
HCM Lane LOS	B	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	-	0

Used pseudo SBL volume of 1 to display delay for that turning movement.
 Used pseudo SBT volume of 1 to prevent fatal error from occurring in SimTraffic.

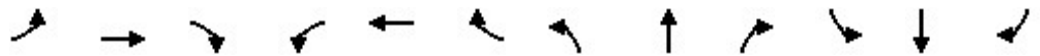
Lanes, Volumes, Timings
1059: John R St & W State Fair Ave

Project Panda
2020 Existing - PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	10	11	11	10	12	12	10	12	12	10	12	12
Storage Length (ft)	50		0	50		0	70		0	70		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1144			1401			1021			1264	
Travel Time (s)		26.0			31.8			23.2			28.7	
Lane Group Flow (vph)	16	103	0	73	315	0	49	292	0	55	191	0
v/c Ratio	0.05	0.14		0.15	0.42		0.12	0.38		0.13	0.25	
Control Delay	10.3	9.9		11.2	12.6		10.6	11.2		10.8	10.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.3	9.9		11.2	12.6		10.6	11.2		10.8	10.2	
Queue Length 50th (ft)	3	17		13	59		9	50		10	32	
Queue Length 95th (ft)	12	41		34	108		25	95		26	62	
Internal Link Dist (ft)		1064			1321			941			1184	
Turn Bay Length (ft)	50			50			70			70		
Base Capacity (vph)	341	727		492	744		425	767		415	760	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.05	0.14		0.15	0.42		0.12	0.38		0.13	0.25	
Intersection Summary												
Area Type:	Other											

Lanes, Volumes, Timings

1404: SB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]/WB M-102 [8 Mile Srv Rd]



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	14	12	14	9	12	12	12	12	12	11	13
Storage Length (ft)	0		0	110		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Link Speed (mph)		40			40			40			40	
Link Distance (ft)		1243			174			245			473	
Travel Time (s)		21.2			3.0			4.2			8.1	
Lane Group Flow (vph)	0	0	0	190	470	0	0	0	0	0	800	0
v/c Ratio				0.16	0.23						0.64	
Control Delay				3.6	4.9						24.1	
Queue Delay				1.1	0.7						0.0	
Total Delay				4.7	5.6						24.1	
Queue Length 50th (ft)				19	34						102	
Queue Length 95th (ft)				40	53						143	
Internal Link Dist (ft)		1163			94			165			393	
Turn Bay Length (ft)				110								
Base Capacity (vph)				1160	2032						1253	
Starvation Cap Reductn				760	1181						0	
Spillback Cap Reductn				0	0						0	
Storage Cap Reductn				0	0						0	
Reduced v/c Ratio				0.47	0.55						0.64	

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 1804: NB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2020 Existing - PM Peak Hour















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	14	9	9	12	12	12	11	11	11	12	12	12
Storage Length (ft)	110		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		166			1022			1294				234
Travel Time (s)		2.8			17.4			22.1				4.0
Lane Group Flow (vph)	299	619	0	0	0	0	0	861	0	0	0	0
v/c Ratio	0.26	0.31						0.72				
Control Delay	2.8	3.1						30.2				
Queue Delay	1.2	0.7						0.0				
Total Delay	4.0	3.7						30.2				
Queue Length 50th (ft)	18	23						135				
Queue Length 95th (ft)	42	42						179				
Internal Link Dist (ft)		86			942			1214				154
Turn Bay Length (ft)	110											
Base Capacity (vph)	1157	2026						1198				
Starvation Cap Reductn	636	1003						0				
Spillback Cap Reductn	0	0						0				
Storage Cap Reductn	0	0						0				
Reduced v/c Ratio	0.57	0.61						0.72				

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 2915: Market Place Dr/Crossover & EB M-102 [8 Mile Rd]

Project Panda
 2020 Existing - PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑	↗						↖↖	↘	↑	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	14	12	12	12	12	12	11	16	16	16
Storage Length (ft)	0		280	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		2	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			No	No		Yes
Link Speed (mph)		40			40			25				40
Link Distance (ft)		263			692			440				110
Travel Time (s)		4.5			11.8			12.0				1.9
Lane Group Flow (vph)	0	2839	129	0	0	0	0	0	228	70	125	0
v/c Ratio		0.53	0.10						0.92	0.42	0.71	
Control Delay		6.6	0.9						110.8	73.2	86.3	
Queue Delay		0.0	0.0						0.0	0.0	0.0	
Total Delay		6.6	0.9						110.8	73.2	86.3	
Queue Length 50th (ft)		151	1						136	70	128	
Queue Length 95th (ft)		161	m9						#230	m107	196	
Internal Link Dist (ft)		183			612			360				30
Turn Bay Length (ft)			280									
Base Capacity (vph)		5401	1250						248	184	194	
Starvation Cap Reductn		0	0						0	0	0	
Spillback Cap Reductn		0	0						0	0	0	
Storage Cap Reductn		0	0						0	0	0	
Reduced v/c Ratio		0.53	0.10						0.92	0.38	0.64	

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	16	12	12	12
Storage Length (ft)		0	230		0	0
Storage Lanes		0	2		0	0
Taper Length (ft)			25		25	
Link Speed (mph)	40			40	40	
Link Distance (ft)	300			693	110	
Travel Time (s)	5.1			11.8	1.9	
Lane Group Flow (vph)	0	0	195	3032	0	0

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
4046: SB M-1 [Woodward Ave] & Crossover

Project Panda
2020 Existing - PM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶					↑↑↑↑
Traffic Volume (vph)	0	0	0	0	0	1513
Future Volume (vph)	0	0	0	0	0	1513
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Satd. Flow (prot)	2222	0	0	0	0	7941
Flt Permitted						
Satd. Flow (perm)	2222	0	0	0	0	7941
Link Speed (mph)	25		40			40
Link Distance (ft)	125		503			811
Travel Time (s)	3.4		8.6			13.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	1645
Sign Control	Stop		Free			Free

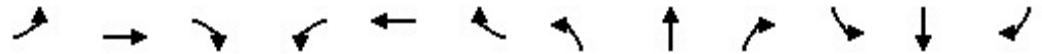
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	49.6%
ICU Level of Service	A
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Queues on the major and minor streets should be 0 FT as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
 4946: NB M-1 [Woodward Ave] & Crossover/State Fair Gate #5

Project Panda
 2020 Existing - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↑↑↑↑↔				
Traffic Volume (vph)	0	0	0	0	0	0	0	3595	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	3595	0	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	12	12
Satd. Flow (prot)	0	0	0	0	2222	0	0	7941	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	2222	0	0	7941	0	0	0	0
Link Speed (mph)		25			25			40				40
Link Distance (ft)		125			680			473				267
Travel Time (s)		3.4			18.5			8.1				4.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	3908	0	0	0	0
Sign Control		Free			Stop			Free				Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	49.6%
ICU Level of Service	A
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Queues on the major and minor streets should be 0 FT as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

APPENDIX – G

2022 No Build Capacity Analysis

HCM Signalized Intersection Capacity Analysis
 1015: Crossover/Driveway & WB M-102 [8 Mile Rd]

Project Panda
 2022 No Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					TTTB		TTT					T
Traffic Volume (vph)	0	0	0	0	2983	12	137	0	0	0	0	4
Future Volume (vph)	0	0	0	0	2983	12	137	0	0	0	0	4
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	11	12	14	14	14	11	11	11
Total Lost time (s)					5.3		5.2					5.7
Lane Util. Factor					0.86		0.97					1.00
Frt					1.00		1.00					0.86
Flt Protected					1.00		0.95					1.00
Satd. Flow (prot)					6516		3855					1640
Flt Permitted					1.00		0.95					1.00
Satd. Flow (perm)					6516		3855					1640
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	3242	13	149	0	0	0	0	4
RTOR Reduction (vph)	0	0	0	0	0	0	130	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	3255	0	19	0	0	0	0	4
Turn Type					NA		Prot					Prot
Protected Phases					6		3					4
Permitted Phases												
Actuated Green, G (s)					52.4		10.0					1.4
Effective Green, g (s)					52.4		10.0					1.4
Actuated g/C Ratio					0.65		0.12					0.02
Clearance Time (s)					5.3		5.2					5.7
Vehicle Extension (s)					3.0		3.0					3.0
Lane Grp Cap (vph)					4267		481					28
v/s Ratio Prot					c0.50		c0.00					c0.00
v/s Ratio Perm												
v/c Ratio					0.76		0.04					0.14
Uniform Delay, d1					9.5		30.8					38.7
Progression Factor					1.00		1.00					1.00
Incremental Delay, d2					1.3		0.0					2.3
Delay (s)					10.9		30.8					41.1
Level of Service					B		C					D
Approach Delay (s)		0.0			10.9			30.8				41.1
Approach LOS		A			B			C				D
Intersection Summary												
HCM 2000 Control Delay			11.8		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)					16.2		
Intersection Capacity Utilization			78.7%		ICU Level of Service					D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 1704: NB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]

Project Panda
 2022 No Build - AM Peak Hour

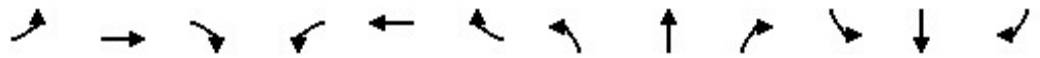


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↑	↑↑				
Traffic Volume (vph)	0	0	0	0	209	372	305	451	0	0	0	0
Future Volume (vph)	0	0	0	0	209	372	305	451	0	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	12	12	14	12	12	12	12	12
Total Lost time (s)					5.7		5.5	5.5				
Lane Util. Factor					0.91		0.91	0.91				
Flt					0.90		1.00	1.00				
Flt Protected					1.00		0.95	0.99				
Satd. Flow (prot)					4839		1808	3548				
Flt Permitted					1.00		0.95	0.99				
Satd. Flow (perm)					4839		1808	3548				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	227	404	332	490	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	317	0	95	13	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	314	0	171	543	0	0	0	0
Turn Type					NA		Split	NA				
Protected Phases					6		5	5				
Permitted Phases												
Actuated Green, G (s)					17.3		51.5	51.5				
Effective Green, g (s)					17.3		51.5	51.5				
Actuated g/C Ratio					0.22		0.64	0.64				
Clearance Time (s)					5.7		5.5	5.5				
Lane Grp Cap (vph)					1046		1163	2284				
v/s Ratio Prot					c0.06		0.09	c0.15				
v/s Ratio Perm												
v/c Ratio					0.30		0.15	0.24				
Uniform Delay, d1					26.3		5.6	6.0				
Progression Factor					1.98		0.15	0.42				
Incremental Delay, d2					0.5		0.3	0.2				
Delay (s)					52.7		1.1	2.8				
Level of Service					D		A	A				
Approach Delay (s)		0.0			52.7			2.2			0.0	
Approach LOS		A			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			24.1		HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio			0.25									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)			11.2				
Intersection Capacity Utilization			49.3%		ICU Level of Service			A				
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1904: SB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2022 No Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑↑								↘	↙↑		
Traffic Volume (vph)	0	371	261	0	0	0	0	0	0	302	265	0	
Future Volume (vph)	0	371	261	0	0	0	0	0	0	302	265	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	11	11	11	12	12	12	12	12	12	16	14	14	
Total Lost time (s)		5.8								5.5	5.5		
Lane Util. Factor		0.91								0.91	0.91		
Frt		0.94								1.00	1.00		
Flt Protected		1.00								0.95	0.98		
Satd. Flow (prot)		4854								1921	3749		
Flt Permitted		1.00								0.95	0.98		
Satd. Flow (perm)		4854								1921	3749		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	403	284	0	0	0	0	0	0	328	288	0	
RTOR Reduction (vph)	0	160	0	0	0	0	0	0	0	38	38	0	
Lane Group Flow (vph)	0	527	0	0	0	0	0	0	0	162	378	0	
Turn Type		NA								Split	NA		
Protected Phases		12								11	11		
Permitted Phases													
Actuated Green, G (s)		18.2								50.5	50.5		
Effective Green, g (s)		18.2								50.5	50.5		
Actuated g/C Ratio		0.23								0.63	0.63		
Clearance Time (s)		5.8								5.5	5.5		
Lane Grp Cap (vph)		1104								1212	2366		
v/s Ratio Prot		c0.11								0.08	c0.10		
v/s Ratio Perm													
v/c Ratio		0.48								0.13	0.16		
Uniform Delay, d1		26.8								5.9	6.0		
Progression Factor		1.00								0.06	0.24		
Incremental Delay, d2		1.5								0.2	0.1		
Delay (s)		28.3								0.5	1.6		
Level of Service		C								A	A		
Approach Delay (s)		28.3			0.0			0.0			1.3		
Approach LOS		C			A			A			A		
Intersection Summary													
HCM 2000 Control Delay			15.5		HCM 2000 Level of Service						B		
HCM 2000 Volume to Capacity ratio			0.24										
Actuated Cycle Length (s)			80.0		Sum of lost time (s)					11.3			
Intersection Capacity Utilization			32.0%		ICU Level of Service					A			
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3945: NB M-1 [Woodward Ave] & Crossover/Site Driveway B

Project Panda
 2022 No Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					←			↑↑↑↑				
Traffic Volume (vph)	0	0	0	0	16	17	0	999	34	0	0	0
Future Volume (vph)	0	0	0	0	16	17	0	999	34	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	16	16	16	12	12	12	12	12	12
Total Lost time (s)					9.0			5.7				
Lane Util. Factor					1.00			0.81				
Flt					0.93			1.00				
Flt Protected					1.00			1.00				
Satd. Flow (prot)					2068			7902				
Flt Permitted					1.00			1.00				
Satd. Flow (perm)					2068			7902				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	17	18	0	1086	37	0	0	0
RTOR Reduction (vph)	0	0	0	0	13	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	22	0	0	1117	0	0	0	0
Turn Type					NA			NA				
Protected Phases					4			2				
Permitted Phases												
Actuated Green, G (s)					23.0			52.3				
Effective Green, g (s)					23.0			52.3				
Actuated g/C Ratio					0.26			0.58				
Clearance Time (s)					9.0			5.7				
Lane Grp Cap (vph)					528			4591				
v/s Ratio Prot					c0.01			c0.14				
v/s Ratio Perm												
v/c Ratio					0.04			0.24				
Uniform Delay, d1					25.2			9.2				
Progression Factor					1.00			1.00				
Incremental Delay, d2					0.1			0.1				
Delay (s)					25.3			9.3				
Level of Service					C			A				
Approach Delay (s)		0.0			25.3			9.3			0.0	
Approach LOS		A			C			A			A	

Intersection Summary

HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.18		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.7
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3045: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2022 No Build - AM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔					↑↑↑↑
Traffic Volume (vph)	16	0	0	0	0	3800
Future Volume (vph)	16	0	0	0	0	3800
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	16	12	12	12	12	12
Total Lost time (s)	6.0					5.7
Lane Util. Factor	1.00					0.81
Fr _t	1.00					1.00
Fl _t Protected	0.95					1.00
Satd. Flow (prot)	2111					7941
Fl _t Permitted	0.95					1.00
Satd. Flow (perm)	2111					7941
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	0	0	0	0	4130
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	17	0	0	0	0	4130
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Actuated Green, G (s)	26.0					52.3
Effective Green, g (s)	26.0					52.3
Actuated g/C Ratio	0.29					0.58
Clearance Time (s)	6.0					5.7
Lane Grp Cap (vph)	609					4614
v/s Ratio Prot	c0.01					c0.52
v/s Ratio Perm						
v/c Ratio	0.03					0.90
Uniform Delay, d ₁	22.9					16.5
Progression Factor	0.32					1.00
Incremental Delay, d ₂	0.1					3.1
Delay (s)	7.5					19.6
Level of Service	A					B
Approach Delay (s)	7.5		0.0		19.6	
Approach LOS	A		A		B	

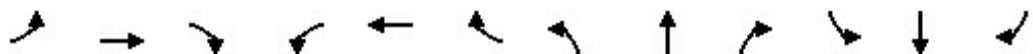
Intersection Summary

HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.7
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2944: NB M-1 [Woodward Ave] & Crossover/W State Fair Ave

Project Panda
 2022 No Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					←			↑↑↑↑				
Traffic Volume (vph)	0	0	0	0	81	157	0	876	49	0	0	0
Future Volume (vph)	0	0	0	0	81	157	0	876	49	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	16	16	16	13	13	13	12	12	11	12	12	12
Total Lost time (s)					8.8			5.2				
Lane Util. Factor					1.00			0.81				
Frbp, ped/bikes					0.99			1.00				
Flpb, ped/bikes					1.00			1.00				
Frt					0.91			0.99				
Flt Protected					1.00			1.00				
Satd. Flow (prot)					1810			7712				
Flt Permitted					1.00			1.00				
Satd. Flow (perm)					1810			7712				
Peak-hour factor, PHF	0.63	0.63	0.63	0.90	0.90	0.90	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	0	90	174	0	952	53	0	0	0
RTOR Reduction (vph)	0	0	0	0	58	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	206	0	0	997	0	0	0	0
Confl. Peds. (#/hr)	5						5		23	23		
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	4%	0%	4%	4%	0%	0%	0%
Turn Type					NA			NA				
Protected Phases					4			2				
Permitted Phases												
Actuated Green, G (s)					22.2			83.8				
Effective Green, g (s)					22.2			83.8				
Actuated g/C Ratio					0.18			0.70				
Clearance Time (s)					8.8			5.2				
Lane Grp Cap (vph)					334			5385				
v/s Ratio Prot					c0.11			c0.13				
v/s Ratio Perm												
v/c Ratio					0.62			0.19				
Uniform Delay, d1					45.0			6.3				
Progression Factor					1.00			1.00				
Incremental Delay, d2					8.3			0.1				
Delay (s)					53.3			6.3				
Level of Service					D			A				
Approach Delay (s)		0.0			53.3			6.3			0.0	
Approach LOS		A			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			16.1					HCM 2000 Level of Service		B		
HCM 2000 Volume to Capacity ratio			0.28									
Actuated Cycle Length (s)			120.0					Sum of lost time (s)		14.0		
Intersection Capacity Utilization			59.5%					ICU Level of Service		B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 2044: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2022 No Build - AM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶					↑↑↑↑
Traffic Volume (vph)	81	0	0	0	0	3816
Future Volume (vph)	81	0	0	0	0	3816
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	16	16	12	12	10	12
Total Lost time (s)	5.8					5.2
Lane Util. Factor	1.00					0.81
Frpb, ped/bikes	1.00					1.00
Flpb, ped/bikes	1.00					1.00
Fr _t	1.00					1.00
Fl _t Protected	0.95					1.00
Satd. Flow (prot)	2153					8020
Fl _t Permitted	0.95					1.00
Satd. Flow (perm)	2153					8020
Peak-hour factor, PHF	0.90	0.90	0.92	0.92	0.63	0.95
Adj. Flow (vph)	90	0	0	0	0	4017
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	90	0	0	0	0	4017
Confl. Peds. (#/hr)	5	5		23	23	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Actuated Green, G (s)	25.2					83.8
Effective Green, g (s)	25.2					83.8
Actuated g/C Ratio	0.21					0.70
Clearance Time (s)	5.8					5.2
Lane Grp Cap (vph)	452					5600
v/s Ratio Prot	c0.04					c0.50
v/s Ratio Perm						
v/c Ratio	0.20					0.72
Uniform Delay, d1	39.1					10.9
Progression Factor	0.24					0.33
Incremental Delay, d2	0.7					0.5
Delay (s)	10.1					4.1
Level of Service	B					A
Approach Delay (s)	10.1		0.0		4.1	
Approach LOS	B		A		A	
Intersection Summary						
HCM 2000 Control Delay			4.2		HCM 2000 Level of Service A	
HCM 2000 Volume to Capacity ratio			0.61			
Actuated Cycle Length (s)			120.0		Sum of lost time (s) 14.0	
Intersection Capacity Utilization			59.5%		ICU Level of Service B	
Analysis Period (min)			15			
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis
 9006: Ralston St/Site Driveway C & W State Fair Ave

Project Panda
 2022 No Build - AM Peak Hour

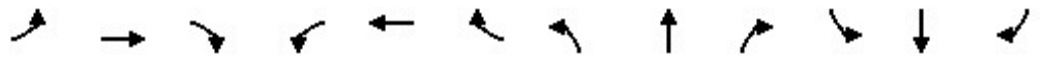


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖			↗			↕			↕	
Traffic Volume (veh/h)	0	50	0	0	225	0	13	0	10	1	1	0
Future Volume (Veh/h)	0	50	0	0	225	0	13	0	10	1	1	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	54	0	0	245	0	14	0	11	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		772										
pX, platoon unblocked												
vC, conflicting volume	245			54			300	299	54	310	299	245
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	245			54			300	299	54	310	299	245
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	100	99	100	100	100
cM capacity (veh/h)	1321			1551			652	613	1013	636	613	794
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	54	245	25	2								
Volume Left	0	0	14	1								
Volume Right	0	0	11	0								
cSH	1321	1700	773	624								
Volume to Capacity	0.00	0.14	0.03	0.00								
Queue Length 95th (ft)	0	0	3	0								
Control Delay (s)	0.0	0.0	9.8	10.8								
Lane LOS			A	B								
Approach Delay (s)	0.0	0.0	9.8	10.8								
Approach LOS			A	B								
Intersection Summary												
Average Delay			0.8									
Intersection Capacity Utilization			21.3%		ICU Level of Service				A			
Analysis Period (min)			15									

Used pseudo SBL volume of 1 to generate delay for this movement.
 Used pseudo SBT volume of 1 to prevent fatal error from occurring in SimTraffic.

HCM Signalized Intersection Capacity Analysis
1059: John R St & W State Fair Ave

Project Panda
2022 No Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	39	4	28	131	23	13	80	21	13	110	11
Future Volume (vph)	9	39	4	28	131	23	13	80	21	13	110	11
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	10	11	11	10	12	12	10	12	12	10	12	12
Total Lost time (s)	5.9	5.9		5.9	5.9		5.3	5.3		5.3	5.3	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1365	1807		1773	1883		1624	1863		1627	1772	
Flt Permitted	0.63	1.00		0.72	1.00		0.67	1.00		0.68	1.00	
Satd. Flow (perm)	907	1807		1350	1883		1140	1863		1171	1772	
Peak-hour factor, PHF	0.83	0.83	0.83	0.76	0.76	0.76	0.89	0.89	0.89	0.86	0.86	0.86
Adj. Flow (vph)	11	47	5	37	172	30	15	90	24	15	128	13
RTOR Reduction (vph)	0	3	0	0	12	0	0	15	0	0	7	0
Lane Group Flow (vph)	11	49	0	37	190	0	15	99	0	15	134	0
Confl. Peds. (#/hr)	7					7	2					2
Heavy Vehicles (%)	29%	6%	0%	0%	4%	0%	9%	5%	0%	9%	10%	22%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	19.1	19.1		19.1	19.1		19.7	19.7		19.7	19.7	
Effective Green, g (s)	19.1	19.1		19.1	19.1		19.7	19.7		19.7	19.7	
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.39	0.39		0.39	0.39	
Clearance Time (s)	5.9	5.9		5.9	5.9		5.3	5.3		5.3	5.3	
Lane Grp Cap (vph)	346	690		515	719		449	734		461	698	
v/s Ratio Prot		0.03			c0.10			0.05			c0.08	
v/s Ratio Perm	0.01			0.03			0.01			0.01		
v/c Ratio	0.03	0.07		0.07	0.26		0.03	0.14		0.03	0.19	
Uniform Delay, d1	9.7	9.8		9.8	10.6		9.3	9.7		9.3	9.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.2		0.3	0.9		0.1	0.4		0.1	0.6	
Delay (s)	9.8	10.0		10.1	11.5		9.4	10.1		9.4	10.5	
Level of Service	A	B		B	B		A	B		A	B	
Approach Delay (s)		10.0			11.3			10.0			10.4	
Approach LOS		A			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			10.6				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.23									
Actuated Cycle Length (s)			50.0			Sum of lost time (s)				11.2		
Intersection Capacity Utilization			27.7%			ICU Level of Service				A		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

Project Panda

1404: SB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]/WB M-202 [8 Mile Srv Rd]



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↙	↕						↕	↘
Traffic Volume (vph)	0	0	0	197	317	0	0	0	0	0	366	241
Future Volume (vph)	0	0	0	197	317	0	0	0	0	0	366	241
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	14	12	14	9	12	12	12	12	12	11	13
Total Lost time (s)				5.6	5.6						5.7	
Lane Util. Factor				0.91	0.91						0.91	
Flt				1.00	1.00						0.94	
Flt Protected				0.95	1.00						1.00	
Satd. Flow (prot)				1808	3198						4866	
Flt Permitted				0.95	1.00						1.00	
Satd. Flow (perm)				1808	3198						4866	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	214	345	0	0	0	0	0	398	262
RTOR Reduction (vph)	0	0	0	40	14	0	0	0	0	0	150	0
Lane Group Flow (vph)	0	0	0	142	363	0	0	0	0	0	510	0
Turn Type				Split	NA						NA	
Protected Phases				10	10						9	
Permitted Phases												
Actuated Green, G (s)				50.4	50.4						18.3	
Effective Green, g (s)				50.4	50.4						18.3	
Actuated g/C Ratio				0.63	0.63						0.23	
Clearance Time (s)				5.6	5.6						5.7	
Lane Grp Cap (vph)				1139	2014						1113	
v/s Ratio Prot				0.08	c0.11						c0.10	
v/s Ratio Perm												
v/c Ratio				0.12	0.18						0.46	
Uniform Delay, d1				5.9	6.2						26.6	
Progression Factor				1.38	1.11						1.00	
Incremental Delay, d2				0.2	0.2						1.4	
Delay (s)				8.4	7.1						27.9	
Level of Service				A	A						C	
Approach Delay (s)		0.0			7.5			0.0			27.9	
Approach LOS		A			A			A			C	
Intersection Summary												
HCM 2000 Control Delay			18.6	HCM 2000 Level of Service				B				
HCM 2000 Volume to Capacity ratio			0.25									
Actuated Cycle Length (s)			80.0	Sum of lost time (s)				11.3				
Intersection Capacity Utilization			32.0%	ICU Level of Service				A				
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1804: NB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2022 No Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	345	328	0	0	0	0	0	411	180	0	0	0
Future Volume (vph)	345	328	0	0	0	0	0	411	180	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	14	9	9	12	12	12	11	11	11	12	12	12
Total Lost time (s)	5.4	5.4						5.7				
Lane Util. Factor	0.91	0.91						0.91				
Frt	1.00	1.00						0.95				
Flt Protected	0.95	0.99						1.00				
Satd. Flow (prot)	1808	3168						4938				
Flt Permitted	0.95	0.99						1.00				
Satd. Flow (perm)	1808	3168						4938				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	375	357	0	0	0	0	0	447	196	0	0	0
RTOR Reduction (vph)	30	30	0	0	0	0	0	99	0	0	0	0
Lane Group Flow (vph)	210	462	0	0	0	0	0	544	0	0	0	0
Turn Type	Split	NA						NA				
Protected Phases	2	2						1				
Permitted Phases												
Actuated Green, G (s)	50.6	50.6						18.3				
Effective Green, g (s)	50.6	50.6						18.3				
Actuated g/C Ratio	0.63	0.63						0.23				
Clearance Time (s)	5.4	5.4						5.7				
Lane Grp Cap (vph)	1143	2003						1129				
v/s Ratio Prot	0.12	c0.15						c0.11				
v/s Ratio Perm												
v/c Ratio	0.18	0.23						0.48				
Uniform Delay, d1	6.1	6.3						26.7				
Progression Factor	0.30	0.41						1.00				
Incremental Delay, d2	0.3	0.3						1.5				
Delay (s)	2.1	2.9						28.2				
Level of Service	A	A						C				
Approach Delay (s)		2.6			0.0			28.2			0.0	
Approach LOS		A			A			C			A	
Intersection Summary												
HCM 2000 Control Delay			14.6					HCM 2000 Level of Service			B	
HCM 2000 Volume to Capacity ratio			0.30									
Actuated Cycle Length (s)			80.0					Sum of lost time (s)		11.2		
Intersection Capacity Utilization			42.6%					ICU Level of Service		A		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2915: Market Place Dr/Crossover & EB M-102 [8 Mile Rd]

Project Panda
 2022 No Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑↑↑	↗						↖↖	↘	↑		
Traffic Volume (vph)	0	2140	55	0	0	0	0	0	56	71	67	0	
Future Volume (vph)	0	2140	55	0	0	0	0	0	56	71	67	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	12	12	14	12	12	12	12	12	11	16	16	16	
Total Lost time (s)		6.2	6.2						6.0	6.0	6.0		
Lane Util. Factor		0.81	1.00						0.88	1.00	1.00		
Fr _t		1.00	0.85						0.85	1.00	1.00		
Fl _t Protected		1.00	1.00						1.00	0.95	1.00		
Satd. Flow (prot)		7941	1778						2836	2111	2222		
Fl _t Permitted		1.00	1.00						1.00	0.95	1.00		
Satd. Flow (perm)		7941	1778						2836	2111	2222		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	2326	60	0	0	0	0	0	61	77	73	0	
RTOR Reduction (vph)	0	0	16	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	2326	44	0	0	0	0	0	61	77	73	0	
Turn Type		NA	Prot						Prot	Split	NA		
Protected Phases		2 10	2 10						3	12	12		
Permitted Phases													
Actuated Green, G (s)		117.1	117.1						7.6	10.9	10.9		
Effective Green, g (s)		117.1	117.1						7.6	10.9	10.9		
Actuated g/C Ratio		0.73	0.73						0.05	0.07	0.07		
Clearance Time (s)									6.0	6.0	6.0		
Vehicle Extension (s)									3.0	3.0	3.0		
Lane Grp Cap (vph)		5811	1301						134	143	151		
v/s Ratio Prot		c0.29	0.02						c0.02	c0.04	0.03		
v/s Ratio Perm													
v/c Ratio		0.40	0.03						0.46	0.54	0.48		
Uniform Delay, d ₁		8.1	5.9						74.2	72.1	71.8		
Progression Factor		0.98	0.91						1.00	1.02	1.01		
Incremental Delay, d ₂		0.0	0.0						2.4	2.8	1.8		
Delay (s)		8.0	5.4						76.6	76.6	74.6		
Level of Service		A	A						E	E	E		
Approach Delay (s)		7.9			0.0			76.6			75.6		
Approach LOS		A			A			E			E		
Intersection Summary													
HCM 2000 Control Delay			13.5									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.41										
Actuated Cycle Length (s)			160.0									Sum of lost time (s)	24.4
Intersection Capacity Utilization			81.5%									ICU Level of Service	D
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
 4046: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2022 No Build - AM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	3800
Future Volume (vph)	0	0	0	0	0	3800
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Satd. Flow (prot)	2222	0	0	0	0	7941
Flt Permitted						
Satd. Flow (perm)	2222	0	0	0	0	7941
Link Speed (mph)	25		40			40
Link Distance (ft)	112		548			766
Travel Time (s)	3.1		9.3			13.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	4130
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.9%
ICU Level of Service	A
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Delays on the major and minor streets should be 0 seconds as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
 4946: NB M-1 [Woodward Ave] & Crossover/State Fair Gate #5

Project Panda
 2022 No Build - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↑↑↑↑↔				
Traffic Volume (vph)	0	0	0	0	0	0	0	1016	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	1016	0	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	12	12
Satd. Flow (prot)	0	0	0	0	2222	0	0	7941	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	2222	0	0	7941	0	0	0	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		112			789			530			211	
Travel Time (s)		3.1			21.5			9.0			3.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	1104	0	0	0	0
Sign Control		Free			Stop			Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.9%
ICU Level of Service	A
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Delays on the major and minor streets should be 0 seconds as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

HCM Signalized Intersection Capacity Analysis
 1015: Crossover/Driveway & WB M-102 [8 Mile Rd]

Project Panda
 2022 No Build - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↑↑↑		↖↗					↖↗	
Traffic Volume (vph)	0	0	0	0	2699	4	305	0	0	0	0	11	
Future Volume (vph)	0	0	0	0	2699	4	305	0	0	0	0	11	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	12	12	12	12	11	12	14	14	14	11	11	11	
Total Lost time (s)					5.3		5.2					5.7	
Lane Util. Factor					0.86		0.97					1.00	
Frt					1.00		1.00					0.86	
Flt Protected					1.00		0.95					1.00	
Satd. Flow (prot)					6519		3855					1640	
Flt Permitted					1.00		0.95					1.00	
Satd. Flow (perm)					6519		3855					1640	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	0	2934	4	332	0	0	0	0	12	
RTOR Reduction (vph)	0	0	0	0	0	0	291	0	0	0	0	0	
Lane Group Flow (vph)	0	0	0	0	2938	0	42	0	0	0	0	12	
Turn Type					NA		Prot					Prot	
Protected Phases					6		3					4	
Permitted Phases													
Actuated Green, G (s)					52.3		10.0					1.5	
Effective Green, g (s)					52.3		10.0					1.5	
Actuated g/C Ratio					0.65		0.12					0.02	
Clearance Time (s)					5.3		5.2					5.7	
Vehicle Extension (s)					3.0		3.0					3.0	
Lane Grp Cap (vph)					4261		481					30	
v/s Ratio Prot					c0.45		c0.01					c0.01	
v/s Ratio Perm													
v/c Ratio					0.69		0.09					0.40	
Uniform Delay, d1					8.7		31.0					38.8	
Progression Factor					1.00		1.00					1.00	
Incremental Delay, d2					0.9		0.1					8.5	
Delay (s)					9.7		30.9					47.3	
Level of Service					A		C					D	
Approach Delay (s)		0.0			9.7		30.9				47.3		
Approach LOS		A			A		C				D		
Intersection Summary													
HCM 2000 Control Delay			12.0		HCM 2000 Level of Service						B		
HCM 2000 Volume to Capacity ratio			0.59										
Actuated Cycle Length (s)			80.0		Sum of lost time (s)					16.2			
Intersection Capacity Utilization			79.6%		ICU Level of Service					D			
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
 1704: NB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]

Project Panda
 2022 No Build - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↑↑↑		↖	↕					
Traffic Volume (vph)	0	0	0	0	166	444	450	588	0	0	0	0	
Future Volume (vph)	0	0	0	0	166	444	450	588	0	0	0	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	12	12	12	12	12	12	14	12	12	12	12	12	
Total Lost time (s)					5.7		5.5	5.5					
Lane Util. Factor					0.91		0.91	0.91					
Fr _t					0.89		1.00	1.00					
Fl _t Protected					1.00		0.95	0.99					
Satd. Flow (prot)					4768		1808	3540					
Fl _t Permitted					1.00		0.95	0.99					
Satd. Flow (perm)					4768		1808	3540					
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	0	180	483	489	639	0	0	0	0	
RTOR Reduction (vph)	0	0	0	0	235	0	131	19	0	0	0	0	
Lane Group Flow (vph)	0	0	0	0	428	0	236	742	0	0	0	0	
Turn Type					NA		Split	NA					
Protected Phases					6		5	5					
Permitted Phases													
Actuated Green, G (s)					17.3		51.5	51.5					
Effective Green, g (s)					17.3		51.5	51.5					
Actuated g/C Ratio					0.22		0.64	0.64					
Clearance Time (s)					5.7		5.5	5.5					
Lane Grp Cap (vph)					1031		1163	2278					
v/s Ratio Prot					c0.09		0.13	c0.21					
v/s Ratio Perm													
v/c Ratio					0.42		0.20	0.33					
Uniform Delay, d ₁					27.0		5.8	6.4					
Progression Factor					1.55		0.00	0.26					
Incremental Delay, d ₂					1.0		0.3	0.3					
Delay (s)					42.9		0.4	2.0					
Level of Service					D		A	A					
Approach Delay (s)		0.0			42.9			1.5			0.0		
Approach LOS		A			D			A			A		
Intersection Summary													
HCM 2000 Control Delay			16.8		HCM 2000 Level of Service				B				
HCM 2000 Volume to Capacity ratio			0.35										
Actuated Cycle Length (s)			80.0		Sum of lost time (s)				11.2				
Intersection Capacity Utilization			57.1%		ICU Level of Service				B				
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1904: SB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2022 No Build - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑↑								↘	↙↑		
Traffic Volume (vph)	0	454	175	0	0	0	0	0	0	404	257	0	
Future Volume (vph)	0	454	175	0	0	0	0	0	0	404	257	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	11	11	11	12	12	12	12	12	12	16	14	14	
Total Lost time (s)		5.8								5.5	5.5		
Lane Util. Factor		0.91								0.91	0.91		
Frt		0.96								1.00	1.00		
Flt Protected		1.00								0.95	0.98		
Satd. Flow (prot)		4959								1921	3728		
Flt Permitted		1.00								0.95	0.98		
Satd. Flow (perm)		4959								1921	3728		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	493	190	0	0	0	0	0	0	439	279	0	
RTOR Reduction (vph)	0	87	0	0	0	0	0	0	0	22	22	0	
Lane Group Flow (vph)	0	596	0	0	0	0	0	0	0	215	459	0	
Turn Type		NA								Split	NA		
Protected Phases		12								11	11		
Permitted Phases													
Actuated Green, G (s)		18.2								50.5	50.5		
Effective Green, g (s)		18.2								50.5	50.5		
Actuated g/C Ratio		0.23								0.63	0.63		
Clearance Time (s)		5.8								5.5	5.5		
Lane Grp Cap (vph)		1128								1212	2353		
v/s Ratio Prot		c0.12								0.11	c0.12		
v/s Ratio Perm													
v/c Ratio		0.53								0.18	0.20		
Uniform Delay, d1		27.1								6.1	6.2		
Progression Factor		1.00								0.10	0.21		
Incremental Delay, d2		1.8								0.3	0.2		
Delay (s)		28.9								0.9	1.5		
Level of Service		C								A	A		
Approach Delay (s)		28.9			0.0			0.0			1.3		
Approach LOS		C			A			A			A		
Intersection Summary													
HCM 2000 Control Delay			14.7		HCM 2000 Level of Service						B		
HCM 2000 Volume to Capacity ratio			0.28										
Actuated Cycle Length (s)			80.0		Sum of lost time (s)						11.3		
Intersection Capacity Utilization			34.9%		ICU Level of Service						A		
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3945: NB M-1 [Woodward Ave] & Crossover/Site Driveway B

Project Panda
 2022 No Build - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↑↑↑↑				
Traffic Volume (vph)	0	0	0	0	16	17	0	3649	34	0	0	0
Future Volume (vph)	0	0	0	0	16	17	0	3649	34	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	16	16	16	12	12	12	12	12	12
Total Lost time (s)					9.0			5.7				
Lane Util. Factor					1.00			0.81				
Fr _t					0.93			1.00				
Fl _t Protected					1.00			1.00				
Satd. Flow (prot)					2068			7930				
Fl _t Permitted					1.00			1.00				
Satd. Flow (perm)					2068			7930				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	17	18	0	3966	37	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	35	0	0	4001	0	0	0	0
Turn Type					NA			NA				
Protected Phases					4			2				
Permitted Phases												
Actuated Green, G (s)					23.0			62.3				
Effective Green, g (s)					23.0			62.3				
Actuated g/C Ratio					0.23			0.62				
Clearance Time (s)					9.0			5.7				
Lane Grp Cap (vph)					475			4940				
v/s Ratio Prot					c0.02			c0.50				
v/s Ratio Perm												
v/c Ratio					0.07			0.81				
Uniform Delay, d ₁					30.2			14.3				
Progression Factor					1.00			1.00				
Incremental Delay, d ₂					0.3			1.5				
Delay (s)					30.5			15.9				
Level of Service					C			B				
Approach Delay (s)		0.0			30.5			15.9			0.0	
Approach LOS		A			C			B			A	

Intersection Summary

HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.7
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3045: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2022 No Build - PM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶					↑↑↑↑
Traffic Volume (vph)	16	0	0	0	0	1543
Future Volume (vph)	16	0	0	0	0	1543
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	16	12	12	12	12	12
Total Lost time (s)	6.0					5.7
Lane Util. Factor	1.00					0.81
Fr _t	1.00					1.00
Fl _t Protected	0.95					1.00
Satd. Flow (prot)	2111					7941
Fl _t Permitted	0.95					1.00
Satd. Flow (perm)	2111					7941
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	0	0	0	0	1677
RTOR Reduction (vph)	13	0	0	0	0	0
Lane Group Flow (vph)	4	0	0	0	0	1677
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Actuated Green, G (s)	26.0					62.3
Effective Green, g (s)	26.0					62.3
Actuated g/C Ratio	0.26					0.62
Clearance Time (s)	6.0					5.7
Lane Grp Cap (vph)	548					4947
v/s Ratio Prot	c0.00					c0.21
v/s Ratio Perm						
v/c Ratio	0.01					0.34
Uniform Delay, d ₁	27.4					9.0
Progression Factor	0.00					1.00
Incremental Delay, d ₂	0.0					0.2
Delay (s)	0.0					9.2
Level of Service	A					A
Approach Delay (s)	0.0		0.0		9.2	
Approach LOS	A		A		A	

Intersection Summary			
HCM 2000 Control Delay	9.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.7
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2944: NB M-1 [Woodward Ave] & Crossover/W State Fair Ave

Project Panda
 2022 No Build - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					←			↑↑↑↑				
Traffic Volume (vph)	0	0	0	0	80	165	0	3518	82	0	0	0
Future Volume (vph)	0	0	0	0	80	165	0	3518	82	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	16	16	16	13	13	13	12	12	11	12	12	12
Total Lost time (s)					8.8			5.2				
Lane Util. Factor					1.00			0.81				
Frbp, ped/bikes					0.99			1.00				
Flpb, ped/bikes					1.00			1.00				
Frt					0.91			1.00				
Flt Protected					1.00			1.00				
Satd. Flow (prot)					1788			7988				
Flt Permitted					1.00			1.00				
Satd. Flow (perm)					1788			7988				
Peak-hour factor, PHF	0.50	0.50	0.50	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	0	86	177	0	3703	86	0	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	262	0	0	3786	0	0	0	0
Confl. Peds. (#/hr)	5					5			23	23		
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	1%	1%	5%	0%	1%	0%	0%	0%	0%
Turn Type					NA			NA				
Protected Phases					4			2				
Permitted Phases												
Actuated Green, G (s)					22.2			83.8				
Effective Green, g (s)					22.2			83.8				
Actuated g/C Ratio					0.18			0.70				
Clearance Time (s)					8.8			5.2				
Lane Grp Cap (vph)					330			5578				
v/s Ratio Prot					c0.15			c0.47				
v/s Ratio Perm												
v/c Ratio					0.79			0.68				
Uniform Delay, d1					46.7			10.4				
Progression Factor					1.00			1.00				
Incremental Delay, d2					17.7			0.7				
Delay (s)					64.4			11.1				
Level of Service					E			B				
Approach Delay (s)		0.0			64.4			11.1			0.0	
Approach LOS		A			E			B			A	
Intersection Summary												
HCM 2000 Control Delay			14.5					HCM 2000 Level of Service		B		
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			120.0					Sum of lost time (s)		14.0		
Intersection Capacity Utilization			65.5%					ICU Level of Service		C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 2044: SB M-1 [Woodward Ave] & Crossover

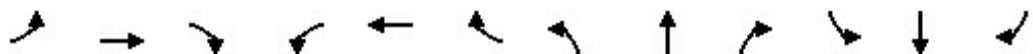
Project Panda
 2022 No Build - PM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶					↑↑↑↑
Traffic Volume (vph)	80	0	0	0	0	1560
Future Volume (vph)	80	0	0	0	0	1560
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	16	16	12	12	10	12
Total Lost time (s)	5.8					5.2
Lane Util. Factor	1.00					0.81
Frpb, ped/bikes	1.00					1.00
Flpb, ped/bikes	1.00					1.00
Fr _t	1.00					1.00
Fl _t Protected	0.95					1.00
Satd. Flow (prot)	2132					7941
Fl _t Permitted	0.95					1.00
Satd. Flow (perm)	2132					7941
Peak-hour factor, PHF	0.95	0.95	0.92	0.92	0.50	0.95
Adj. Flow (vph)	84	0	0	0	0	1642
RTOR Reduction (vph)	33	0	0	0	0	0
Lane Group Flow (vph)	51	0	0	0	0	1642
Confl. Peds. (#/hr)	5	5		23	23	
Heavy Vehicles (%)	1%	0%	0%	0%	0%	2%
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Actuated Green, G (s)	25.2					83.8
Effective Green, g (s)	25.2					83.8
Actuated g/C Ratio	0.21					0.70
Clearance Time (s)	5.8					5.2
Lane Grp Cap (vph)	447					5545
v/s Ratio Prot	c0.02					c0.21
v/s Ratio Perm						
v/c Ratio	0.11					0.30
Uniform Delay, d1	38.4					6.9
Progression Factor	0.00					0.49
Incremental Delay, d2	0.3					0.1
Delay (s)	0.3					3.5
Level of Service	A					A
Approach Delay (s)	0.3		0.0		3.5	
Approach LOS	A		A		A	
Intersection Summary						
HCM 2000 Control Delay			3.4		HCM 2000 Level of Service A	
HCM 2000 Volume to Capacity ratio			0.26			
Actuated Cycle Length (s)			120.0		Sum of lost time (s) 14.0	
Intersection Capacity Utilization			65.5%		ICU Level of Service C	
Analysis Period (min)			15			
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis
 9006: Ralston St/Site Driveway C & W State Fair Ave

Project Panda
 2022 No Build - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖			↗			↕			↕	
Traffic Volume (veh/h)	0	82	0	0	227	0	18	0	11	1	1	0
Future Volume (Veh/h)	0	82	0	0	227	0	18	0	11	1	1	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	89	0	0	247	0	20	0	12	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		772										
pX, platoon unblocked												
vC, conflicting volume	247			89			336	336	89	348	336	247
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	247			89			336	336	89	348	336	247
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	99	100	100	100
cM capacity (veh/h)	1319			1506			616	585	969	599	585	792
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	89	247	32	2								
Volume Left	0	0	20	1								
Volume Right	0	0	12	0								
cSH	1319	1700	714	592								
Volume to Capacity	0.00	0.15	0.04	0.00								
Queue Length 95th (ft)	0	0	4	0								
Control Delay (s)	0.0	0.0	10.3	11.1								
Lane LOS			B	B								
Approach Delay (s)	0.0	0.0	10.3	11.1								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			21.3%		ICU Level of Service				A			
Analysis Period (min)			15									

Used pseudo SBL volume of 1 to generate delay for this movement.
 Used pseudo SBT volume of 1 to prevent fatal error from occurring in SimTraffic.

HCM Signalized Intersection Capacity Analysis
1059: John R St & W State Fair Ave

Project Panda
2022 No Build - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	15	93	11	71	253	56	48	221	64	52	155	25	
Future Volume (vph)	15	93	11	71	253	56	48	221	64	52	155	25	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	10	11	11	10	12	12	10	12	12	10	12	12	
Total Lost time (s)	5.9	5.9		5.9	5.9		5.3	5.3		5.3	5.3		
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Frt	1.00	0.98		1.00	0.97		1.00	0.97		1.00	0.98		
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1542	1886		1773	1907		1612	1894		1772	1900		
Flt Permitted	0.50	1.00		0.68	1.00		0.63	1.00		0.53	1.00		
Satd. Flow (perm)	818	1886		1275	1907		1062	1894		981	1900		
Peak-hour factor, PHF	0.90	0.90	0.90	0.88	0.88	0.88	0.88	0.88	0.88	0.85	0.85	0.85	
Adj. Flow (vph)	17	103	12	81	288	64	55	251	73	61	182	29	
RTOR Reduction (vph)	0	7	0	0	16	0	0	21	0	0	12	0	
Lane Group Flow (vph)	17	108	0	81	336	0	55	303	0	61	199	0	
Confl. Peds. (#/hr)									1	1			
Heavy Vehicles (%)	15%	1%	0%	0%	2%	2%	10%	2%	0%	0%	2%	10%	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA		
Protected Phases		4			8			2			6		
Permitted Phases	4			8			2			6			
Actuated Green, G (s)	19.1	19.1		19.1	19.1		19.7	19.7		19.7	19.7		
Effective Green, g (s)	19.1	19.1		19.1	19.1		19.7	19.7		19.7	19.7		
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.39	0.39		0.39	0.39		
Clearance Time (s)	5.9	5.9		5.9	5.9		5.3	5.3		5.3	5.3		
Lane Grp Cap (vph)	312	720		487	728		418	746		386	748		
v/s Ratio Prot		0.06			c0.18			c0.16			0.10		
v/s Ratio Perm	0.02			0.06			0.05			0.06			
v/c Ratio	0.05	0.15		0.17	0.46		0.13	0.41		0.16	0.27		
Uniform Delay, d1	9.8	10.1		10.2	11.6		9.7	10.9		9.8	10.3		
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	0.3	0.4		0.7	2.1		0.7	1.6		0.9	0.9		
Delay (s)	10.1	10.6		10.9	13.7		10.3	12.6		10.7	11.1		
Level of Service	B	B		B	B		B	B		B	B		
Approach Delay (s)		10.5			13.2			12.2			11.0		
Approach LOS		B			B			B			B		
Intersection Summary													
HCM 2000 Control Delay			12.1									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.43										
Actuated Cycle Length (s)			50.0									Sum of lost time (s)	11.2
Intersection Capacity Utilization			52.7%									ICU Level of Service	A
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

Project Panda

1404: SB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]/WB M-202 [8 Mile Srv Rd]



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations				↙	↕						↕	↘	
Traffic Volume (vph)	0	0	0	196	420	0	0	0	0	0	464	284	
Future Volume (vph)	0	0	0	196	420	0	0	0	0	0	464	284	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	12	14	12	14	9	12	12	12	12	12	11	13	
Total Lost time (s)				5.6	5.6							5.7	
Lane Util. Factor				0.91	0.91							0.91	
Fr _t				1.00	1.00							0.94	
Fl _t Protected				0.95	1.00							1.00	
Satd. Flow (prot)				1808	3205							4880	
Fl _t Permitted				0.95	1.00							1.00	
Satd. Flow (perm)				1808	3205							4880	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	213	457	0	0	0	0	0	504	309	
RTOR Reduction (vph)	0	0	0	21	14	0	0	0	0	0	139	0	
Lane Group Flow (vph)	0	0	0	171	464	0	0	0	0	0	674	0	
Turn Type				Split	NA							NA	
Protected Phases				10	10							9	
Permitted Phases													
Actuated Green, G (s)				50.4	50.4							18.3	
Effective Green, g (s)				50.4	50.4							18.3	
Actuated g/C Ratio				0.63	0.63							0.23	
Clearance Time (s)				5.6	5.6							5.7	
Lane Grp Cap (vph)				1139	2019							1116	
v/s Ratio Prot				0.09	c0.14							c0.14	
v/s Ratio Perm													
v/c Ratio				0.15	0.23							0.60	
Uniform Delay, d ₁				6.0	6.4							27.6	
Progression Factor				0.83	0.82							1.00	
Incremental Delay, d ₂				0.3	0.3							2.4	
Delay (s)				5.3	5.5							30.0	
Level of Service				A	A							C	
Approach Delay (s)		0.0			5.4			0.0				30.0	
Approach LOS		A			A			A				C	
Intersection Summary													
HCM 2000 Control Delay			18.9		HCM 2000 Level of Service						B		
HCM 2000 Volume to Capacity ratio			0.33										
Actuated Cycle Length (s)			80.0		Sum of lost time (s)					11.3			
Intersection Capacity Utilization			34.9%		ICU Level of Service					A			
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1804: NB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2022 No Build - PM Peak Hour















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↖↗						↖↗↘				
Traffic Volume (vph)	390	468	0	0	0	0	0	649	155	0	0	0
Future Volume (vph)	390	468	0	0	0	0	0	649	155	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	14	9	9	12	12	12	11	11	11	12	12	12
Total Lost time (s)	5.4	5.4						5.7				
Lane Util. Factor	0.91	0.91						0.91				
Frt	1.00	1.00						0.97				
Flt Protected	0.95	0.99						1.00				
Satd. Flow (prot)	1808	3181						5025				
Flt Permitted	0.95	0.99						1.00				
Satd. Flow (perm)	1808	3181						5025				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	424	509	0	0	0	0	0	705	168	0	0	0
RTOR Reduction (vph)	14	14	0	0	0	0	0	49	0	0	0	0
Lane Group Flow (vph)	287	618	0	0	0	0	0	824	0	0	0	0
Turn Type	Split	NA						NA				
Protected Phases	2	2						1				
Permitted Phases												
Actuated Green, G (s)	50.6	50.6						18.3				
Effective Green, g (s)	50.6	50.6						18.3				
Actuated g/C Ratio	0.63	0.63						0.23				
Clearance Time (s)	5.4	5.4						5.7				
Lane Grp Cap (vph)	1143	2011						1149				
v/s Ratio Prot	0.16	c0.19						c0.16				
v/s Ratio Perm												
v/c Ratio	0.25	0.31						0.72				
Uniform Delay, d1	6.4	6.7						28.5				
Progression Factor	0.41	0.43						1.00				
Incremental Delay, d2	0.5	0.4						3.8				
Delay (s)	3.2	3.3						32.3				
Level of Service	A	A						C				
Approach Delay (s)		3.2			0.0			32.3			0.0	
Approach LOS		A			A			C			A	
Intersection Summary												
HCM 2000 Control Delay			17.3					HCM 2000 Level of Service			B	
HCM 2000 Volume to Capacity ratio			0.42									
Actuated Cycle Length (s)			80.0					Sum of lost time (s)		11.2		
Intersection Capacity Utilization			50.5%					ICU Level of Service		A		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2915: Market Place Dr/Crossover & EB M-102 [8 Mile Rd]

Project Panda
 2022 No Build - PM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑↑↑	↗						↖↖	↘	↑		
Traffic Volume (vph)	0	2611	119	0	0	0	0	0	210	65	115	0	
Future Volume (vph)	0	2611	119	0	0	0	0	0	210	65	115	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	12	12	14	12	12	12	12	12	11	16	16	16	
Total Lost time (s)		6.2	6.2						6.0	6.0	6.0		
Lane Util. Factor		0.81	1.00						0.88	1.00	1.00		
Fr _t		1.00	0.85						0.85	1.00	1.00		
Fl _t Protected		1.00	1.00						1.00	0.95	1.00		
Satd. Flow (prot)		7941	1778						2836	2111	2222		
Fl _t Permitted		1.00	1.00						1.00	0.95	1.00		
Satd. Flow (perm)		7941	1778						2836	2111	2222		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	2838	129	0	0	0	0	0	228	71	125	0	
RTOR Reduction (vph)	0	0	41	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	2838	88	0	0	0	0	0	228	71	125	0	
Turn Type		NA	Prot						Prot	Split	NA		
Protected Phases		2 10	2 10						3	12	12		
Permitted Phases													
Actuated Green, G (s)		108.8	108.8						14.0	12.8	12.8		
Effective Green, g (s)		108.8	108.8						14.0	12.8	12.8		
Actuated g/C Ratio		0.68	0.68						0.09	0.08	0.08		
Clearance Time (s)									6.0	6.0	6.0		
Vehicle Extension (s)									3.0	3.0	3.0		
Lane Grp Cap (vph)		5399	1209						248	168	177		
v/s Ratio Prot		c0.36	0.05						c0.08	0.03	c0.06		
v/s Ratio Perm													
v/c Ratio		0.53	0.07						0.92	0.42	0.71		
Uniform Delay, d ₁		12.7	8.6						72.4	70.1	71.8		
Progression Factor		0.97	1.17						1.00	0.96	0.96		
Incremental Delay, d ₂		0.1	0.0						35.7	1.4	9.8		
Delay (s)		12.5	10.1						108.1	68.6	78.4		
Level of Service		B	B						F	E	E		
Approach Delay (s)		12.4			0.0			108.1			74.9		
Approach LOS		B			A			F			E		
Intersection Summary													
HCM 2000 Control Delay			22.4									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.58										
Actuated Cycle Length (s)			160.0									Sum of lost time (s)	24.4
Intersection Capacity Utilization			85.8%									ICU Level of Service	E
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
4046: SB M-1 [Woodward Ave] & Crossover

Project Panda
2022 No Build - PM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	1543
Future Volume (vph)	0	0	0	0	0	1543
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Satd. Flow (prot)	2222	0	0	0	0	7941
Flt Permitted						
Satd. Flow (perm)	2222	0	0	0	0	7941
Link Speed (mph)	25		40			40
Link Distance (ft)	102		507			808
Travel Time (s)	2.8		8.6			13.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	1677
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	50.4%
ICU Level of Service	A
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Delays on the major and minor streets should be 0 seconds as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
 4946: NB M-1 [Woodward Ave] & Crossover/State Fair Gate #5

Project Panda
 2022 No Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↑↑↑↑				
Traffic Volume (vph)	0	0	0	0	0	0	0	3666	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	3666	0	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	12	12
Satd. Flow (prot)	0	0	0	0	2222	0	0	7941	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	2222	0	0	7941	0	0	0	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		102			913			485			256	
Travel Time (s)		2.8			24.9			8.3			4.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	3985	0	0	0	0
Sign Control		Free			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	50.4%
	ICU Level of Service A
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Delays on the major and minor streets should be 0 seconds as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
 1015: Crossover/Driveway & WB M-102 [8 Mile Rd]

Project Panda
 2022 No Build - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↖↗					↖
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	11	12	14	14	14	11	11	11
Storage Length (ft)	0		0	325		0	0		0	0		0
Storage Lanes	0		0	0		0	2		0	0		1
Taper Length (ft)	25			100			25			25		
Right Turn on Red			Yes			Yes	Yes		Yes			No
Link Speed (mph)		40			40			25				25
Link Distance (ft)		675			2329			96				286
Travel Time (s)		11.5			39.7			2.6				7.8
Lane Group Flow (vph)	0	0	0	0	3255	0	149	0	0	0	0	4
v/c Ratio					0.70		0.18					0.03
Control Delay					8.6		1.5					34.0
Queue Delay					0.0		0.0					0.0
Total Delay					8.6		1.5					34.0
Queue Length 50th (ft)					190		1					2
Queue Length 95th (ft)					415		6					11
Internal Link Dist (ft)		595			2249			16				206
Turn Bay Length (ft)												
Base Capacity (vph)					4638		862					211
Starvation Cap Reductn					0		0					0
Spillback Cap Reductn					0		0					0
Storage Cap Reductn					0		0					0
Reduced v/c Ratio					0.70		0.17					0.02
Intersection Summary												
Area Type:	Other											

Lanes, Volumes, Timings
 1915: EB M-102 [8 Mile Rd] & Crossover

Project Panda
 2022 No Build - AM Peak Hour






















Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	14	12	12	12	12	12
Storage Length (ft)	325			0	0	0
Storage Lanes	2			0	0	0
Taper Length (ft)	25				25	
Link Speed (mph)		40	40		40	
Link Distance (ft)		674	2304		96	
Travel Time (s)		11.5	39.3		1.6	
Lane Group Flow (vph)	149	2315	0	0	0	0

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 1704: NB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]

Project Panda
 2022 No Build - AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  		 	 				
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	12	12	14	12	12	12	12	12
Storage Length (ft)	0		0	875		0	90		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		174			1335			234				818
Travel Time (s)		3.0			22.8			4.0				13.9
Lane Group Flow (vph)	0	0	0	0	631	0	266	556	0	0	0	0
v/c Ratio					0.46		0.21	0.24				
Control Delay					11.7		0.5	2.6				
Queue Delay					0.0		0.5	0.4				
Total Delay					11.7		1.0	3.0				
Queue Length 50th (ft)					23		0	28				
Queue Length 95th (ft)					86		3	32				
Internal Link Dist (ft)		94			1255			154				738
Turn Bay Length (ft)							90					
Base Capacity (vph)					1363		1258	2296				
Starvation Cap Reductn					0		622	1195				
Spillback Cap Reductn					0		0	0				
Storage Cap Reductn					0		0	0				
Reduced v/c Ratio					0.46		0.42	0.50				
Intersection Summary												
Area Type:	Other											

Lanes, Volumes, Timings
 1904: SB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2022 No Build - AM Peak Hour



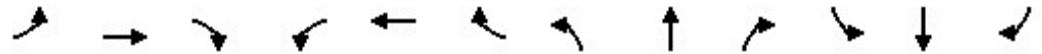
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑								↘	↙↑	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	11	11	11	12	12	12	12	12	12	16	14	14
Storage Length (ft)	0		900	0		0	0		0	90		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		1309			166			808				245
Travel Time (s)		22.3			2.8			13.8				4.2
Lane Group Flow (vph)	0	687	0	0	0	0	0	0	0	200	416	0
v/c Ratio		0.54								0.16	0.17	
Control Delay		20.5								0.4	1.2	
Queue Delay		0.0								0.5	0.3	
Total Delay		20.5								0.9	1.6	
Queue Length 50th (ft)		75								1	8	
Queue Length 95th (ft)		112								1	8	
Internal Link Dist (ft)		1229			86			728				165
Turn Bay Length (ft)										90		
Base Capacity (vph)		1264								1250	2404	
Starvation Cap Reductn		0								724	1395	
Spillback Cap Reductn		0								0	0	
Storage Cap Reductn		0								0	0	
Reduced v/c Ratio		0.54								0.38	0.41	

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 3945: NB M-1 [Woodward Ave] & Crossover/Site Driveway B

Project Panda
 2022 No Build - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	16	16	16	12	12	12	12	12	12
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		30			25			40				40
Link Distance (ft)		98			1019			842				530
Travel Time (s)		2.2			27.8			14.4				9.0
Lane Group Flow (vph)	0	0	0	0	35	0	0	1123	0	0	0	0
v/c Ratio					0.06			0.24				
Control Delay					16.4			9.2				
Queue Delay					0.0			0.0				
Total Delay					16.4			9.2				
Queue Length 50th (ft)					7			70				
Queue Length 95th (ft)					30			85				
Internal Link Dist (ft)		18			939			762				450
Turn Bay Length (ft)												
Base Capacity (vph)					542			4597				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			0				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.06			0.24				

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 3045: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2022 No Build - AM Peak Hour



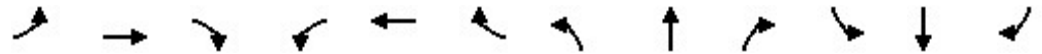
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Right Turn on Red	Yes	Yes		Yes		
Link Speed (mph)	25		40			40
Link Distance (ft)	98		813			548
Travel Time (s)	2.7		13.9			9.3
Lane Group Flow (vph)	17	0	0	0	0	4130
v/c Ratio	0.03					0.90
Control Delay	7.6					19.9
Queue Delay	0.0					0.0
Total Delay	7.6					19.9
Queue Length 50th (ft)	4					468
Queue Length 95th (ft)	5					515
Internal Link Dist (ft)	18		733			468
Turn Bay Length (ft)						
Base Capacity (vph)	609					4614
Starvation Cap Reductn	0					0
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.03					0.90

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 2944: NB M-1 [Woodward Ave] & Crossover/W State Fair Ave

Project Panda
 2022 No Build - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	16	16	13	13	13	12	12	11	12	12	12
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		25			25			40				40
Link Distance (ft)		76			457			1032				842
Travel Time (s)		2.1			12.5			17.6				14.4
Lane Group Flow (vph)	0	0	0	0	264	0	0	1005	0	0	0	0
v/c Ratio					0.67			0.19				
Control Delay					42.4			6.2				
Queue Delay					0.0			0.0				
Total Delay					42.4			6.2				
Queue Length 50th (ft)					141			58				
Queue Length 95th (ft)					235			68				
Internal Link Dist (ft)		1			377			952				762
Turn Bay Length (ft)												
Base Capacity (vph)					392			5392				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			0				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.67			0.19				

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 2044: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2022 No Build - AM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	16	12	12	10	12
Storage Length (ft)	30	0		0	0	
Storage Lanes	0	0		0	0	
Taper Length (ft)	25				25	
Right Turn on Red	Yes	Yes		Yes		
Link Speed (mph)	25		40			40
Link Distance (ft)	76		1017			813
Travel Time (s)	2.1		17.3			13.9
Lane Group Flow (vph)	90	0	0	0	0	4017
v/c Ratio	0.20					0.72
Control Delay	10.3					11.9
Queue Delay	0.0					0.2
Total Delay	10.3					12.1
Queue Length 50th (ft)	15					417
Queue Length 95th (ft)	m16					441
Internal Link Dist (ft)	1		937			733
Turn Bay Length (ft)	30					
Base Capacity (vph)	452					5600
Starvation Cap Reductn	0					600
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.20					0.80

Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.

Intersection												
Int Delay, s/veh	0.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	50	0	0	225	0	13	0	10	1	1	0
Future Vol, veh/h	0	50	0	0	225	0	13	0	10	1	1	0
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	54	0	0	245	0	14	0	11	1	1	0

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	245	0	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	-
Pot Cap-1 Maneuver	1321	-	0	0
Stage 1	-	-	0	0
Stage 2	-	-	0	0
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1321	-	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-





















Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	9.8	10.8
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	771	1321	-	-	-	626
HCM Lane V/C Ratio	0.032	-	-	-	-	0.003
HCM Control Delay (s)	9.8	0	-	-	-	10.8
HCM Lane LOS	A	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	-	0

Used pseudo SBL volume of 1 to display delay for that turning movement.
 Used pseudo SBT volume of 1 to prevent fatal error from occurring in SimTraffic.

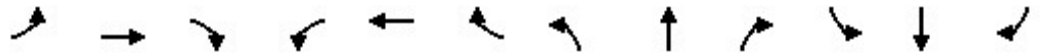
Lanes, Volumes, Timings
1059: John R St & W State Fair Ave

Project Panda
2022 No Build - AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	10	11	11	10	12	12	10	12	12	10	12	12
Storage Length (ft)	50		0	50		0	70		0	70		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1146			1401			1021			1264	
Travel Time (s)		26.0			31.8			23.2			28.7	
Lane Group Flow (vph)	11	52	0	37	202	0	15	114	0	15	141	0
v/c Ratio	0.03	0.08		0.07	0.28		0.03	0.15		0.03	0.20	
Control Delay	10.1	9.6		10.4	10.9		9.7	8.8		9.6	10.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.1	9.6		10.4	10.9		9.7	8.8		9.6	10.0	
Queue Length 50th (ft)	2	8		7	35		3	16		3	23	
Queue Length 95th (ft)	9	23		17	58		11	40		11	50	
Internal Link Dist (ft)		1066			1321			941			1184	
Turn Bay Length (ft)	50			50			70			70		
Base Capacity (vph)	346	693		515	731		449	748		461	705	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.03	0.08		0.07	0.28		0.03	0.15		0.03	0.20	
Intersection Summary												
Area Type:	Other											

Lanes, Volumes, Timings

1404: SB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]/WB M-202 [8 Mile Srv Rd]



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	14	12	14	9	12	12	12	12	12	11	13
Storage Length (ft)	0		0	110		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Link Speed (mph)		40			40			40			40	
Link Distance (ft)		1243			174			245			469	
Travel Time (s)		21.2			3.0			4.2			8.0	
Lane Group Flow (vph)	0	0	0	182	377	0	0	0	0	0	660	0
v/c Ratio				0.15	0.19						0.52	
Control Delay				2.8	5.3						20.4	
Queue Delay				1.2	0.9						0.0	
Total Delay				4.0	6.2						20.4	
Queue Length 50th (ft)				13	33						73	
Queue Length 95th (ft)				36	51						108	
Internal Link Dist (ft)		1163			94			165			389	
Turn Bay Length (ft)				110								
Base Capacity (vph)				1179	2029						1262	
Starvation Cap Reductn				800	1340						0	
Spillback Cap Reductn				0	0						0	
Storage Cap Reductn				0	0						0	
Reduced v/c Ratio				0.48	0.55						0.52	

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 1804: NB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2022 No Build - AM Peak Hour















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	14	9	9	12	12	12	11	11	11	12	12	12
Storage Length (ft)	110		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		166			994			1294				234
Travel Time (s)		2.8			16.9			22.1				4.0
Lane Group Flow (vph)	240	492	0	0	0	0	0	643	0	0	0	0
v/c Ratio	0.20	0.24						0.52				
Control Delay	1.6	2.4						23.2				
Queue Delay	1.0	0.6						0.0				
Total Delay	2.6	3.1						23.2				
Queue Length 50th (ft)	10	19						81				
Queue Length 95th (ft)	21	25						117				
Internal Link Dist (ft)		86			914			1214				154
Turn Bay Length (ft)	110											
Base Capacity (vph)	1173	2032						1227				
Starvation Cap Reductn	700	1132						0				
Spillback Cap Reductn	0	0						0				
Storage Cap Reductn	0	0						0				
Reduced v/c Ratio	0.51	0.55						0.52				

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 2915: Market Place Dr/Crossover & EB M-102 [8 Mile Rd]

Project Panda
 2022 No Build - AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑	↗						↖↖	↘	↑	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	14	12	12	12	12	12	11	16	16	16
Storage Length (ft)	0		280	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		2	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			No	No		Yes
Link Speed (mph)		40			40			25				40
Link Distance (ft)		261			674			411				87
Travel Time (s)		4.4			11.5			11.2				1.5
Lane Group Flow (vph)	0	2326	60	0	0	0	0	0	61	77	73	0
v/c Ratio		0.39	0.04						0.38	0.53	0.48	
Control Delay		4.3	0.8						79.4	83.2	80.0	
Queue Delay		0.0	0.0						0.0	0.0	0.0	
Total Delay		4.3	0.8						79.4	83.2	80.0	
Queue Length 50th (ft)		90	0						35	81	76	
Queue Length 95th (ft)		128	6						64	m123	m116	
Internal Link Dist (ft)		181			594			331				7
Turn Bay Length (ft)			280									
Base Capacity (vph)		6337	1431						248	184	194	
Starvation Cap Reductn		0	0						0	0	0	
Spillback Cap Reductn		0	0						0	0	0	
Storage Cap Reductn		0	0						0	0	0	
Reduced v/c Ratio		0.37	0.04						0.25	0.42	0.38	

Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	16	12	12	12
Storage Length (ft)		0	230		0	0
Storage Lanes		0	2		0	0
Taper Length (ft)			25		25	
Link Speed (mph)	40			40	40	
Link Distance (ft)	318			675	87	
Travel Time (s)	5.4			11.5	1.5	
Lane Group Flow (vph)	0	0	150	3246	0	0

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 4046: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2022 No Build - AM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶					↑↑↑↑
Traffic Volume (vph)	0	0	0	0	0	3800
Future Volume (vph)	0	0	0	0	0	3800
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Satd. Flow (prot)	2222	0	0	0	0	7941
Flt Permitted						
Satd. Flow (perm)	2222	0	0	0	0	7941
Link Speed (mph)	25		40			40
Link Distance (ft)	112		548			766
Travel Time (s)	3.1		9.3			13.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	4130
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.9%
ICU Level of Service	A
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Queues on the major and minor streets should be 0 FT as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
 4946: NB M-1 [Woodward Ave] & Crossover/State Fair Gate #5

Project Panda
 2022 No Build - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↑↑↑↑				
Traffic Volume (vph)	0	0	0	0	0	0	0	1016	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	1016	0	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	12	12
Satd. Flow (prot)	0	0	0	0	2222	0	0	7941	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	2222	0	0	7941	0	0	0	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		112			789			530			211	
Travel Time (s)		3.1			21.5			9.0			3.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	1104	0	0	0	0
Sign Control		Free			Stop			Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.9%
ICU Level of Service	A
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Queues on the major and minor streets should be 0 FT as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
1015: Crossover/Driveway & WB M-102 [8 Mile Rd]

Project Panda
2022 No Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↘↘					↗
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	11	12	14	14	14	11	11	11
Storage Length (ft)	0		0	325		0	0		0	0		0
Storage Lanes	0		0	0		0	2		0	0		1
Taper Length (ft)	25			100			25			25		
Right Turn on Red			Yes			Yes	Yes		Yes			No
Link Speed (mph)		40			40			25				25
Link Distance (ft)		680			2329			96				286
Travel Time (s)		11.6			39.7			2.6				7.8
Lane Group Flow (vph)	0	0	0	0	2938	0	332	0	0	0	0	12
v/c Ratio					0.63		0.41					0.08
Control Delay					7.7		7.0					34.9
Queue Delay					0.0		0.0					0.0
Total Delay					7.7		7.0					34.9
Queue Length 50th (ft)					157		2					6
Queue Length 95th (ft)					347		m22					21
Internal Link Dist (ft)		600			2249			16				206
Turn Bay Length (ft)												
Base Capacity (vph)					4635		837					211
Starvation Cap Reductn					0		0					0
Spillback Cap Reductn					0		0					0
Storage Cap Reductn					0		0					0
Reduced v/c Ratio					0.63		0.40					0.06

Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
 1915: EB M-102 [8 Mile Rd] & Crossover

Project Panda
 2022 No Build - PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	14	12	12	12	12	12
Storage Length (ft)	325			0	0	0
Storage Lanes	2			0	0	0
Taper Length (ft)	25				25	
Link Speed (mph)		40	40		40	
Link Distance (ft)		679	2304		96	
Travel Time (s)		11.6	39.3		1.6	
Lane Group Flow (vph)	332	2805	0	0	0	0

Intersection Summary	
Area Type:	Other

Lanes, Volumes, Timings
 1704: NB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]

Project Panda
 2022 No Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↑	↑↑				
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	12	12	14	12	12	12	12	12
Storage Length (ft)	0		0	875		0	90		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		174			1335			234				818
Travel Time (s)		3.0			22.8			4.0				13.9
Lane Group Flow (vph)	0	0	0	0	663	0	367	761	0	0	0	0
v/c Ratio					0.52		0.28	0.33				
Control Delay					24.4		0.5	1.9				
Queue Delay					0.0		0.7	0.7				
Total Delay					24.4		1.1	2.6				
Queue Length 50th (ft)					85		1	26				
Queue Length 95th (ft)					115		m1	29				
Internal Link Dist (ft)		94			1255			154				738
Turn Bay Length (ft)							90					
Base Capacity (vph)					1266		1294	2297				
Starvation Cap Reductn					0		587	1121				
Spillback Cap Reductn					0		0	0				
Storage Cap Reductn					0		0	0				
Reduced v/c Ratio					0.52		0.52	0.65				

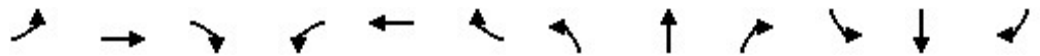
Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
 1904: SB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2022 No Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑								↘	↙↑	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	11	11	11	12	12	12	12	12	12	16	14	14
Storage Length (ft)	0		900	0		0	0		0	90		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		1292			166			808				245
Travel Time (s)		22.0			2.8			13.8				4.2
Lane Group Flow (vph)	0	683	0	0	0	0	0	0	0	237	481	0
v/c Ratio		0.56								0.19	0.20	
Control Delay		24.7								0.7	1.3	
Queue Delay		0.0								0.8	0.5	
Total Delay		24.7								1.5	1.8	
Queue Length 50th (ft)		91								2	9	
Queue Length 95th (ft)		128								2	9	
Internal Link Dist (ft)		1212			86			728				165
Turn Bay Length (ft)										90		
Base Capacity (vph)		1215								1234	2374	
Starvation Cap Reductn		0								717	1381	
Spillback Cap Reductn		0								0	0	
Storage Cap Reductn		0								0	0	
Reduced v/c Ratio		0.56								0.46	0.48	

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 3945: NB M-1 [Woodward Ave] & Crossover/Site Driveway B

Project Panda
 2022 No Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	16	16	16	12	12	12	12	12	12
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		30			25			40				40
Link Distance (ft)		98			1019			842				485
Travel Time (s)		2.2			27.8			14.4				8.3
Lane Group Flow (vph)	0	0	0	0	35	0	0	4003	0	0	0	0
v/c Ratio					0.07			0.81				
Control Delay					30.8			16.0				
Queue Delay					0.0			0.0				
Total Delay					30.8			16.0				
Queue Length 50th (ft)					18			439				
Queue Length 95th (ft)					43			476				
Internal Link Dist (ft)		18			939			762				405
Turn Bay Length (ft)												
Base Capacity (vph)					475			4943				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			0				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.07			0.81				

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 3045: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2022 No Build - PM Peak Hour



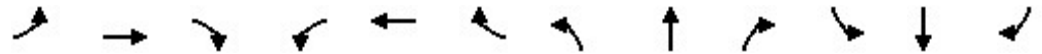
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Right Turn on Red	Yes	Yes		Yes		
Link Speed (mph)	25		40			40
Link Distance (ft)	98		411			507
Travel Time (s)	2.7		7.0			8.6
Lane Group Flow (vph)	17	0	0	0	0	1677
v/c Ratio	0.03					0.34
Control Delay	0.1					9.2
Queue Delay	0.0					0.0
Total Delay	0.1					9.2
Queue Length 50th (ft)	0					115
Queue Length 95th (ft)	0					133
Internal Link Dist (ft)	18		331			427
Turn Bay Length (ft)						
Base Capacity (vph)	570					4947
Starvation Cap Reductn	0					0
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.03					0.34

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 2944: NB M-1 [Woodward Ave] & Crossover/W State Fair Ave

Project Panda
 2022 No Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	16	16	13	13	13	12	12	11	12	12	12
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		25			25			40				40
Link Distance (ft)		76			772			1032				842
Travel Time (s)		2.1			21.1			17.6				14.4
Lane Group Flow (vph)	0	0	0	0	263	0	0	3789	0	0	0	0
v/c Ratio					0.79			0.68				
Control Delay					64.9			11.1				
Queue Delay					0.0			0.0				
Total Delay					64.9			11.1				
Queue Length 50th (ft)					196			372				
Queue Length 95th (ft)					#326			396				
Internal Link Dist (ft)		1			692			952				762
Turn Bay Length (ft)												
Base Capacity (vph)					331			5583				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			0				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.79			0.68				

Intersection Summary

Area Type: Other
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
 2044: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2022 No Build - PM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	16	12	12	10	12
Storage Length (ft)	30	0		0	0	
Storage Lanes	0	0		0	0	
Taper Length (ft)	25				25	
Right Turn on Red	Yes	Yes		Yes		
Link Speed (mph)	25		40			40
Link Distance (ft)	76		1017			403
Travel Time (s)	2.1		17.3			6.9
Lane Group Flow (vph)	84	0	0	0	0	1642
v/c Ratio	0.17					0.30
Control Delay	0.5					7.0
Queue Delay	0.0					0.0
Total Delay	0.5					7.0
Queue Length 50th (ft)	0					107
Queue Length 95th (ft)	m0					121
Internal Link Dist (ft)	1		937			323
Turn Bay Length (ft)	30					
Base Capacity (vph)	480					5545
Starvation Cap Reductn	0					0
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.17					0.30

Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↗			↕			↕	
Traffic Vol, veh/h	0	82	0	0	227	0	18	0	11	1	1	0
Future Vol, veh/h	0	82	0	0	227	0	18	0	11	1	1	0
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	89	0	0	247	0	20	0	12	1	1	0

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	247	0	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	-
Pot Cap-1 Maneuver	1319	-	0	0
Stage 1	-	-	0	0
Stage 2	-	-	0	0
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1319	-	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-






















Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	10.3	11.1
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	715	1319	-	-	-	595
HCM Lane V/C Ratio	0.044	-	-	-	-	0.004
HCM Control Delay (s)	10.3	0	-	-	-	11.1
HCM Lane LOS	B	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	-	0

Used pseudo SBL volume of 1 to display delay for that turning movement.
 Used pseudo SBT volume of 1 to prevent fatal error from occurring in SimTraffic.

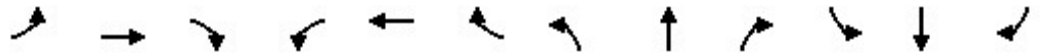
Lanes, Volumes, Timings
1059: John R St & W State Fair Ave

Project Panda
2022 No Build - PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	10	11	11	10	12	12	10	12	12	10	12	12
Storage Length (ft)	50		0	50		0	70		0	70		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1144			1401			1021			1264	
Travel Time (s)		26.0			31.8			23.2			28.7	
Lane Group Flow (vph)	17	115	0	81	352	0	55	324	0	61	211	0
v/c Ratio	0.05	0.16		0.17	0.47		0.13	0.42		0.16	0.28	
Control Delay	10.5	10.0		11.4	13.3		10.8	11.9		11.2	10.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.5	10.0		11.4	13.3		10.8	11.9		11.2	10.6	
Queue Length 50th (ft)	3	19		15	68		10	58		11	36	
Queue Length 95th (ft)	13	45		37	123		27	106		29	68	
Internal Link Dist (ft)		1064			1321			941			1184	
Turn Bay Length (ft)	50			50			70			70		
Base Capacity (vph)	312	727		487	744		418	767		386	759	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.05	0.16		0.17	0.47		0.13	0.42		0.16	0.28	
Intersection Summary												
Area Type:	Other											

Lanes, Volumes, Timings

1404: SB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]/WB M-202 [8 Mile Srv Rd]



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↙	↕						↕	↘
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	14	12	14	9	12	12	12	12	12	11	13
Storage Length (ft)	0		0	110		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Link Speed (mph)		40			40			40			40	
Link Distance (ft)		1243			174			245			473	
Travel Time (s)		21.2			3.0			4.2			8.1	
Lane Group Flow (vph)	0	0	0	192	478	0	0	0	0	0	813	0
v/c Ratio				0.17	0.24						0.65	
Control Delay				3.7	5.0						24.3	
Queue Delay				1.1	0.7						0.0	
Total Delay				4.8	5.7						24.3	
Queue Length 50th (ft)				9	36						104	
Queue Length 95th (ft)				41	54						145	
Internal Link Dist (ft)		1163			94			165			393	
Turn Bay Length (ft)				110								
Base Capacity (vph)				1160	2032						1255	
Starvation Cap Reductn				758	1173						0	
Spillback Cap Reductn				0	0						0	
Storage Cap Reductn				0	0						0	
Reduced v/c Ratio				0.48	0.56						0.65	

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 1804: NB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2022 No Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	14	9	9	12	12	12	11	11	11	12	12	12
Storage Length (ft)	110		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		166			1046			1294				234
Travel Time (s)		2.8			17.8			22.1				4.0
Lane Group Flow (vph)	301	632	0	0	0	0	0	873	0	0	0	0
v/c Ratio	0.26	0.31						0.73				
Control Delay	2.9	3.1						30.5				
Queue Delay	1.3	0.7						0.0				
Total Delay	4.1	3.8						30.5				
Queue Length 50th (ft)	18	24						137				
Queue Length 95th (ft)	43	44						182				
Internal Link Dist (ft)		86			966			1214				154
Turn Bay Length (ft)	110											
Base Capacity (vph)	1157	2024						1198				
Starvation Cap Reductn	637	994						0				
Spillback Cap Reductn	0	0						0				
Storage Cap Reductn	0	0						0				
Reduced v/c Ratio	0.58	0.61						0.73				

Intersection Summary

Area Type:	Other
------------	-------

Lanes, Volumes, Timings
 2915: Market Place Dr/Crossover & EB M-102 [8 Mile Rd]

Project Panda
 2022 No Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑	↗						↖↖	↘	↑	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	14	12	12	12	12	12	11	16	16	16
Storage Length (ft)	0		280	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		2	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			No	No		Yes
Link Speed (mph)		40			40			25				40
Link Distance (ft)		272			679			413				88
Travel Time (s)		4.6			11.6			11.3				1.5
Lane Group Flow (vph)	0	2838	129	0	0	0	0	0	228	71	125	0
v/c Ratio		0.53	0.10						0.92	0.42	0.71	
Control Delay		6.6	0.9						110.8	73.3	86.0	
Queue Delay		0.0	0.0						0.0	0.0	0.0	
Total Delay		6.6	0.9						110.8	73.3	86.0	
Queue Length 50th (ft)		152	1						136	71	128	
Queue Length 95th (ft)		161	m10						#230	m107	196	
Internal Link Dist (ft)		192			599			333				8
Turn Bay Length (ft)			280									
Base Capacity (vph)		5401	1250						248	184	194	
Starvation Cap Reductn		0	0						0	0	0	
Spillback Cap Reductn		0	0						0	0	0	
Storage Cap Reductn		0	0						0	0	0	
Reduced v/c Ratio		0.53	0.10						0.92	0.39	0.64	

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	16	12	12	12
Storage Length (ft)		0	230		0	0
Storage Lanes		0	2		0	0
Taper Length (ft)			25		25	
Link Speed (mph)	40			40	40	
Link Distance (ft)	313			680	88	
Travel Time (s)	5.3			11.6	1.5	
Lane Group Flow (vph)	0	0	196	3082	0	0

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 4046: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2022 No Build - PM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	1543
Future Volume (vph)	0	0	0	0	0	1543
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Satd. Flow (prot)	2222	0	0	0	0	7941
Flt Permitted						
Satd. Flow (perm)	2222	0	0	0	0	7941
Link Speed (mph)	25		40			40
Link Distance (ft)	102		507			808
Travel Time (s)	2.8		8.6			13.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	1677
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	50.4%
ICU Level of Service	A
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Queues on the major and minor streets should be 0 FT as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
 4946: NB M-1 [Woodward Ave] & Crossover/State Fair Gate #5

Project Panda
 2022 No Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↑↑↑↑↔				
Traffic Volume (vph)	0	0	0	0	0	0	0	3666	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	3666	0	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	12	12
Satd. Flow (prot)	0	0	0	0	2222	0	0	7941	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	2222	0	0	7941	0	0	0	0
Link Speed (mph)		25			25			40				40
Link Distance (ft)		102			913			485				256
Travel Time (s)		2.8			24.9			8.3				4.4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	3985	0	0	0	0
Sign Control		Free			Stop			Free				Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	50.4%
ICU Level of Service	A
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Queues on the major and minor streets should be 0 FT as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

APPENDIX – H

2032 No Build Capacity Analysis

HCM Signalized Intersection Capacity Analysis
 1015: Crossover/Driveway & WB M-102 [8 Mile Rd]













Project Panda
 2032 No Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↖↗					↖↗
Traffic Volume (vph)	0	0	0	0	3269	13	145	0	0	0	0	4
Future Volume (vph)	0	0	0	0	3269	13	145	0	0	0	0	4
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	11	12	14	14	14	11	11	11
Total Lost time (s)					5.3		5.2					5.7
Lane Util. Factor					0.86		0.97					1.00
Frt					1.00		1.00					0.86
Flt Protected					1.00		0.95					1.00
Satd. Flow (prot)					6516		3855					1640
Flt Permitted					1.00		0.95					1.00
Satd. Flow (perm)					6516		3855					1640
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	3553	14	158	0	0	0	0	4
RTOR Reduction (vph)	0	0	0	0	0	0	138	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	3567	0	20	0	0	0	0	4
Turn Type					NA		Prot					Prot
Protected Phases					6		3					4
Permitted Phases												
Actuated Green, G (s)					52.4		10.0					1.4
Effective Green, g (s)					52.4		10.0					1.4
Actuated g/C Ratio					0.65		0.12					0.02
Clearance Time (s)					5.3		5.2					5.7
Vehicle Extension (s)					3.0		3.0					3.0
Lane Grp Cap (vph)					4267		481					28
v/s Ratio Prot					c0.55		c0.01					c0.00
v/s Ratio Perm												
v/c Ratio					0.84		0.04					0.14
Uniform Delay, d1					10.5		30.8					38.7
Progression Factor					1.00		1.00					1.00
Incremental Delay, d2					2.1		0.0					2.3
Delay (s)					12.6		30.8					41.1
Level of Service					B		C					D
Approach Delay (s)		0.0			12.6			30.8			41.1	
Approach LOS		A			B			C			D	
Intersection Summary												
HCM 2000 Control Delay			13.4		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)				16.2			
Intersection Capacity Utilization			84.9%		ICU Level of Service				E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 1704: NB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]

Project Panda
 2032 No Build - AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↘	↙				
Traffic Volume (vph)	0	0	0	0	224	408	332	493	0	0	0	0
Future Volume (vph)	0	0	0	0	224	408	332	493	0	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	12	12	14	12	12	12	12	12
Total Lost time (s)					5.7		5.5	5.5				
Lane Util. Factor					0.91		0.91	0.91				
Flt					0.90		1.00	1.00				
Flt Protected					1.00		0.95	0.99				
Satd. Flow (prot)					4834		1808	3548				
Flt Permitted					1.00		0.95	0.99				
Satd. Flow (perm)					4834		1808	3548				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	243	443	361	536	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	292	0	90	13	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	394	0	199	595	0	0	0	0
Turn Type					NA		Split	NA				
Protected Phases					6		5	5				
Permitted Phases												
Actuated Green, G (s)					17.3		51.5	51.5				
Effective Green, g (s)					17.3		51.5	51.5				
Actuated g/C Ratio					0.22		0.64	0.64				
Clearance Time (s)					5.7		5.5	5.5				
Lane Grp Cap (vph)					1045		1163	2284				
v/s Ratio Prot					c0.08		0.11	c0.17				
v/s Ratio Perm												
v/c Ratio					0.38		0.17	0.26				
Uniform Delay, d1					26.8		5.7	6.1				
Progression Factor					1.70		0.13	0.42				
Incremental Delay, d2					0.7		0.3	0.3				
Delay (s)					46.0		1.0	2.8				
Level of Service					D		A	A				
Approach Delay (s)		0.0			46.0			2.2			0.0	
Approach LOS		A			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			21.2		HCM 2000 Level of Service				C			
HCM 2000 Volume to Capacity ratio			0.29									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)				11.2			
Intersection Capacity Utilization			52.3%		ICU Level of Service				A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 1904: SB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2032 No Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑↑								↘	↙↑		
Traffic Volume (vph)	0	405	287	0	0	0	0	0	0	324	287	0	
Future Volume (vph)	0	405	287	0	0	0	0	0	0	324	287	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	11	11	11	12	12	12	12	12	12	16	14	14	
Total Lost time (s)		5.8								5.5	5.5		
Lane Util. Factor		0.91								0.91	0.91		
Frt		0.94								1.00	1.00		
Flt Protected		1.00								0.95	0.98		
Satd. Flow (prot)		4852								1921	3749		
Flt Permitted		1.00								0.95	0.98		
Satd. Flow (perm)		4852								1921	3749		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	440	312	0	0	0	0	0	0	352	312	0	
RTOR Reduction (vph)	0	160	0	0	0	0	0	0	0	31	31	0	
Lane Group Flow (vph)	0	592	0	0	0	0	0	0	0	184	418	0	
Turn Type		NA								Split	NA		
Protected Phases		12								11	11		
Permitted Phases													
Actuated Green, G (s)		18.2								50.5	50.5		
Effective Green, g (s)		18.2								50.5	50.5		
Actuated g/C Ratio		0.23								0.63	0.63		
Clearance Time (s)		5.8								5.5	5.5		
Lane Grp Cap (vph)		1103								1212	2366		
v/s Ratio Prot		c0.12								0.10	c0.11		
v/s Ratio Perm													
v/c Ratio		0.54								0.15	0.18		
Uniform Delay, d1		27.2								6.0	6.1		
Progression Factor		1.00								0.10	0.27		
Incremental Delay, d2		1.9								0.2	0.2		
Delay (s)		29.1								0.8	1.8		
Level of Service		C								A	A		
Approach Delay (s)		29.1			0.0			0.0			1.5		
Approach LOS		C			A			A			A		
Intersection Summary													
HCM 2000 Control Delay			16.1		HCM 2000 Level of Service						B		
HCM 2000 Volume to Capacity ratio			0.27										
Actuated Cycle Length (s)			80.0		Sum of lost time (s)						11.3		
Intersection Capacity Utilization			33.9%		ICU Level of Service						A		
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3945: NB M-1 [Woodward Ave] & Crossover/Site Driveway B

Project Panda
 2032 No Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↑↑↑↑				
Traffic Volume (vph)	0	0	0	0	18	19	0	1096	37	0	0	0
Future Volume (vph)	0	0	0	0	18	19	0	1096	37	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	16	16	16	12	12	12	12	12	12
Total Lost time (s)					9.0			6.0				
Lane Util. Factor					1.00			0.81				
Fr _t					0.93			1.00				
Fl _t Protected					1.00			1.00				
Satd. Flow (prot)					2069			7902				
Fl _t Permitted					1.00			1.00				
Satd. Flow (perm)					2069			7902				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	20	21	0	1191	40	0	0	0
RTOR Reduction (vph)	0	0	0	0	17	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	24	0	0	1226	0	0	0	0
Turn Type					NA			NA				
Protected Phases					4			2				
Permitted Phases												
Actuated Green, G (s)					22.0			83.0				
Effective Green, g (s)					22.0			83.0				
Actuated g/C Ratio					0.18			0.69				
Clearance Time (s)					9.0			6.0				
Lane Grp Cap (vph)					379			5465				
v/s Ratio Prot					c0.01			c0.16				
v/s Ratio Perm												
v/c Ratio					0.06			0.22				
Uniform Delay, d ₁					40.5			6.8				
Progression Factor					1.00			0.72				
Incremental Delay, d ₂					0.3			0.1				
Delay (s)					40.8			5.0				
Level of Service					D			A				
Approach Delay (s)		0.0			40.8			5.0			0.0	
Approach LOS		A			D			A			A	

Intersection Summary

HCM 2000 Control Delay	6.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3045: SB M-1 [Woodward Ave] & Crossover

Project Panda
2032 No Build - AM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↵					↑↑↑↑
Traffic Volume (vph)	18	0	0	0	0	4172
Future Volume (vph)	18	0	0	0	0	4172
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	16	12	12	12	12	12
Total Lost time (s)	6.0					6.0
Lane Util. Factor	1.00					0.81
Fr _t	1.00					1.00
Fl _t Protected	0.95					1.00
Satd. Flow (prot)	2111					7941
Fl _t Permitted	0.95					1.00
Satd. Flow (perm)	2111					7941
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	0	0	0	0	4535
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	20	0	0	0	0	4535
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Actuated Green, G (s)	25.0					83.0
Effective Green, g (s)	25.0					83.0
Actuated g/C Ratio	0.21					0.69
Clearance Time (s)	6.0					6.0
Lane Grp Cap (vph)	439					5492
v/s Ratio Prot	c0.01					c0.57
v/s Ratio Perm						
v/c Ratio	0.05					0.83
Uniform Delay, d ₁	38.0					13.3
Progression Factor	0.38					1.00
Incremental Delay, d ₂	0.2					1.5
Delay (s)	14.7					14.8
Level of Service	B					B
Approach Delay (s)	14.7		0.0		14.8	
Approach LOS	B		A		B	
Intersection Summary						
HCM 2000 Control Delay	14.8			HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio	0.66					
Actuated Cycle Length (s)	120.0			Sum of lost time (s)		15.0
Intersection Capacity Utilization	60.1%			ICU Level of Service		B
Analysis Period (min)	15					

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2944: NB M-1 [Woodward Ave] & Crossover/W State Fair Ave

Project Panda
 2032 No Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					←			↑↑↑↑				
Traffic Volume (vph)	0	0	0	0	88	172	0	962	54	0	0	0
Future Volume (vph)	0	0	0	0	88	172	0	962	54	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	16	16	16	13	13	13	12	12	11	12	12	12
Total Lost time (s)					8.8			5.2				
Lane Util. Factor					1.00			0.81				
Frbp, ped/bikes					0.99			1.00				
Flpb, ped/bikes					1.00			1.00				
Frt					0.91			0.99				
Flt Protected					1.00			1.00				
Satd. Flow (prot)					1810			7711				
Flt Permitted					1.00			1.00				
Satd. Flow (perm)					1810			7711				
Peak-hour factor, PHF	0.63	0.63	0.63	0.90	0.90	0.90	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	0	98	191	0	1046	59	0	0	0
RTOR Reduction (vph)	0	0	0	0	59	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	230	0	0	1097	0	0	0	0
Confl. Peds. (#/hr)	5						5		23	23		
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	4%	0%	4%	4%	0%	0%	0%
Turn Type					NA			NA				
Protected Phases					4			2				
Permitted Phases												
Actuated Green, G (s)					22.2			83.8				
Effective Green, g (s)					22.2			83.8				
Actuated g/C Ratio					0.18			0.70				
Clearance Time (s)					8.8			5.2				
Lane Grp Cap (vph)					334			5384				
v/s Ratio Prot					c0.13			c0.14				
v/s Ratio Perm												
v/c Ratio					0.69			0.20				
Uniform Delay, d1					45.7			6.4				
Progression Factor					1.00			1.00				
Incremental Delay, d2					11.1			0.1				
Delay (s)					56.8			6.5				
Level of Service					E			A				
Approach Delay (s)		0.0			56.8			6.5			0.0	
Approach LOS		A			E			A			A	
Intersection Summary												
HCM 2000 Control Delay			16.9					HCM 2000 Level of Service		B		
HCM 2000 Volume to Capacity ratio			0.31									
Actuated Cycle Length (s)			120.0					Sum of lost time (s)		14.0		
Intersection Capacity Utilization			63.6%					ICU Level of Service		B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 2044: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 No Build - AM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶					↑↑↑↑
Traffic Volume (vph)	88	0	0	0	0	4190
Future Volume (vph)	88	0	0	0	0	4190
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	16	16	12	12	10	12
Total Lost time (s)	5.8					5.2
Lane Util. Factor	1.00					0.81
Frpb, ped/bikes	1.00					1.00
Flpb, ped/bikes	1.00					1.00
Fr _t	1.00					1.00
Fl _t Protected	0.95					1.00
Satd. Flow (prot)	2153					8020
Fl _t Permitted	0.95					1.00
Satd. Flow (perm)	2153					8020
Peak-hour factor, PHF	0.90	0.90	0.92	0.92	0.63	0.95
Adj. Flow (vph)	98	0	0	0	0	4411
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	98	0	0	0	0	4411
Confl. Peds. (#/hr)	5	5		23	23	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Actuated Green, G (s)	25.2					83.8
Effective Green, g (s)	25.2					83.8
Actuated g/C Ratio	0.21					0.70
Clearance Time (s)	5.8					5.2
Lane Grp Cap (vph)	452					5600
v/s Ratio Prot	c0.05					c0.55
v/s Ratio Perm						
v/c Ratio	0.22					0.79
Uniform Delay, d ₁	39.2					12.1
Progression Factor	0.23					0.30
Incremental Delay, d ₂	0.7					0.6
Delay (s)	9.6					4.2
Level of Service	A					A
Approach Delay (s)	9.6		0.0		4.2	
Approach LOS	A		A		A	
Intersection Summary						
HCM 2000 Control Delay			4.4		HCM 2000 Level of Service A	
HCM 2000 Volume to Capacity ratio			0.67			
Actuated Cycle Length (s)			120.0		Sum of lost time (s) 14.0	
Intersection Capacity Utilization			63.6%		ICU Level of Service B	
Analysis Period (min)			15			
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis
 9006: Ralston St/Site Driveway C & W State Fair Ave

Project Panda
 2032 No Build - AM Peak Hour

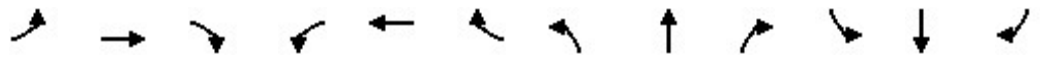


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	0	55	0	0	245	0	15	0	11	1	1	0
Future Volume (Veh/h)	0	55	0	0	245	0	15	0	11	1	1	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	60	0	0	266	0	16	0	12	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		772										
pX, platoon unblocked												
vC, conflicting volume	266			60			326	326	60	338	326	266
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	266			60			326	326	60	338	326	266
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	99	100	100	100
cM capacity (veh/h)	1298			1544			626	592	1005	608	592	773
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	60	266	28	2								
Volume Left	0	0	16	1								
Volume Right	0	0	12	0								
cSH	1298	1700	747	600								
Volume to Capacity	0.00	0.16	0.04	0.00								
Queue Length 95th (ft)	0	0	3	0								
Control Delay (s)	0.0	0.0	10.0	11.0								
Lane LOS			B	B								
Approach Delay (s)	0.0	0.0	10.0	11.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.8									
Intersection Capacity Utilization			22.3%		ICU Level of Service				A			
Analysis Period (min)			15									

Used pseudo SBL volume of 1 to generate delay for this movement.
 Used pseudo SBT volume of 1 to prevent fatal error from occurring in SimTraffic.

HCM Signalized Intersection Capacity Analysis
1059: John R St & W State Fair Ave

Project Panda
2032 No Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	39	4	28	132	24	13	81	21	13	111	11
Future Volume (vph)	9	39	4	28	132	24	13	81	21	13	111	11
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	10	11	11	10	12	12	10	12	12	10	12	12
Total Lost time (s)	5.9	5.9		5.9	5.9		5.3	5.3		5.3	5.3	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1365	1807		1773	1881		1624	1864		1627	1772	
Flt Permitted	0.63	1.00		0.72	1.00		0.67	1.00		0.68	1.00	
Satd. Flow (perm)	904	1807		1350	1881		1139	1864		1170	1772	
Peak-hour factor, PHF	0.83	0.83	0.83	0.76	0.76	0.76	0.89	0.89	0.89	0.86	0.86	0.86
Adj. Flow (vph)	11	47	5	37	174	32	15	91	24	15	129	13
RTOR Reduction (vph)	0	3	0	0	13	0	0	15	0	0	7	0
Lane Group Flow (vph)	11	49	0	37	193	0	15	100	0	15	135	0
Confl. Peds. (#/hr)	7					7	2					2
Heavy Vehicles (%)	29%	6%	0%	0%	4%	0%	9%	5%	0%	9%	10%	22%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	19.1	19.1		19.1	19.1		19.7	19.7		19.7	19.7	
Effective Green, g (s)	19.1	19.1		19.1	19.1		19.7	19.7		19.7	19.7	
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.39	0.39		0.39	0.39	
Clearance Time (s)	5.9	5.9		5.9	5.9		5.3	5.3		5.3	5.3	
Lane Grp Cap (vph)	345	690		515	718		448	734		460	698	
v/s Ratio Prot		0.03			c0.10			0.05			c0.08	
v/s Ratio Perm	0.01			0.03			0.01			0.01		
v/c Ratio	0.03	0.07		0.07	0.27		0.03	0.14		0.03	0.19	
Uniform Delay, d1	9.7	9.8		9.8	10.6		9.3	9.7		9.3	9.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.2		0.3	0.9		0.1	0.4		0.1	0.6	
Delay (s)	9.8	10.0		10.1	11.6		9.4	10.1		9.4	10.6	
Level of Service	A	B		B	B		A	B		A	B	
Approach Delay (s)		10.0			11.3			10.0			10.4	
Approach LOS		A			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			10.7				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.23									
Actuated Cycle Length (s)			50.0			Sum of lost time (s)				11.2		
Intersection Capacity Utilization			27.7%			ICU Level of Service				A		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

Project Panda

1404: SB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]/WB M-102 [8 Mile Srv Rd]



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↙	↕						↕	↘
Traffic Volume (vph)	0	0	0	212	344	0	0	0	0	0	395	264
Future Volume (vph)	0	0	0	212	344	0	0	0	0	0	395	264
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	14	12	14	9	12	12	12	12	12	11	13
Total Lost time (s)				5.6	5.6						5.7	
Lane Util. Factor				0.91	0.91						0.91	
Fr _t				1.00	1.00						0.94	
Fl _t Protected				0.95	1.00						1.00	
Satd. Flow (prot)				1808	3198						4863	
Fl _t Permitted				0.95	1.00						1.00	
Satd. Flow (perm)				1808	3198						4863	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	230	374	0	0	0	0	0	429	287
RTOR Reduction (vph)	0	0	0	33	14	0	0	0	0	0	152	0
Lane Group Flow (vph)	0	0	0	162	395	0	0	0	0	0	564	0
Turn Type				Split	NA						NA	
Protected Phases				10	10						9	
Permitted Phases												
Actuated Green, G (s)				50.4	50.4						18.3	
Effective Green, g (s)				50.4	50.4						18.3	
Actuated g/C Ratio				0.63	0.63						0.23	
Clearance Time (s)				5.6	5.6						5.7	
Lane Grp Cap (vph)				1139	2014						1112	
v/s Ratio Prot				0.09	c0.12						c0.12	
v/s Ratio Perm												
v/c Ratio				0.14	0.20						0.51	
Uniform Delay, d ₁				6.0	6.2						26.9	
Progression Factor				1.35	1.17						1.00	
Incremental Delay, d ₂				0.2	0.2						1.7	
Delay (s)				8.4	7.5						28.6	
Level of Service				A	A						C	
Approach Delay (s)		0.0			7.8			0.0			28.6	
Approach LOS		A			A			A			C	

Intersection Summary

HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	11.3
Intersection Capacity Utilization	33.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1804: NB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2032 No Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↖↗						↖↗↘				
Traffic Volume (vph)	379	350	0	0	0	0	0	447	197	0	0	0
Future Volume (vph)	379	350	0	0	0	0	0	447	197	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	14	9	9	12	12	12	11	11	11	12	12	12
Total Lost time (s)	5.4	5.4						5.7				
Lane Util. Factor	0.91	0.91						0.91				
Frt	1.00	1.00						0.95				
Flt Protected	0.95	0.99						1.00				
Satd. Flow (prot)	1808	3167						4937				
Flt Permitted	0.95	0.99						1.00				
Satd. Flow (perm)	1808	3167						4937				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	412	380	0	0	0	0	0	486	214	0	0	0
RTOR Reduction (vph)	24	24	0	0	0	0	0	99	0	0	0	0
Lane Group Flow (vph)	236	508	0	0	0	0	0	601	0	0	0	0
Turn Type	Split	NA						NA				
Protected Phases	2	2						1				
Permitted Phases												
Actuated Green, G (s)	50.6	50.6						18.3				
Effective Green, g (s)	50.6	50.6						18.3				
Actuated g/C Ratio	0.63	0.63						0.23				
Clearance Time (s)	5.4	5.4						5.7				
Lane Grp Cap (vph)	1143	2003						1129				
v/s Ratio Prot	0.13	c0.16						c0.12				
v/s Ratio Perm												
v/c Ratio	0.21	0.25						0.53				
Uniform Delay, d1	6.2	6.4						27.1				
Progression Factor	0.36	0.44						1.00				
Incremental Delay, d2	0.4	0.3						1.8				
Delay (s)	2.6	3.1						28.9				
Level of Service	A	A						C				
Approach Delay (s)		2.9			0.0			28.9			0.0	
Approach LOS		A			A			C			A	
Intersection Summary												
HCM 2000 Control Delay			15.1					HCM 2000 Level of Service			B	
HCM 2000 Volume to Capacity ratio			0.33									
Actuated Cycle Length (s)			80.0					Sum of lost time (s)		11.2		
Intersection Capacity Utilization			45.7%					ICU Level of Service		A		
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings
 4046: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 No Build - AM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	4172
Future Volume (vph)	0	0	0	0	0	4172
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Satd. Flow (prot)	2222	0	0	0	0	7941
Flt Permitted						
Satd. Flow (perm)	2222	0	0	0	0	7941
Link Speed (mph)	25		40			40
Link Distance (ft)	104		557			758
Travel Time (s)	2.8		9.5			12.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	4535
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.9%
ICU Level of Service	B
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Delays on the major and minor streets should be 0 seconds as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
 4946: NB M-1 [Woodward Ave] & Crossover/State Fair Gate #5

Project Panda
 2032 No Build - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↑↑↑↑↔				
Traffic Volume (vph)	0	0	0	0	0	0	0	1115	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	1115	0	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	12	12
Satd. Flow (prot)	0	0	0	0	2222	0	0	7941	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	2222	0	0	7941	0	0	0	0
Link Speed (mph)		25			25			40				40
Link Distance (ft)		104			979			523				218
Travel Time (s)		2.8			26.7			8.9				3.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	1212	0	0	0	0
Sign Control		Free			Stop			Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.9%
ICU Level of Service	B
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Delays on the major and minor streets should be 0 seconds as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

HCM Signalized Intersection Capacity Analysis
 1015: Crossover/Driveway & WB M-102 [8 Mile Rd]

Project Panda
 2032 No Build - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					TTTB		TTT					T
Traffic Volume (vph)	0	0	0	0	2931	4	314	0	0	0	0	11
Future Volume (vph)	0	0	0	0	2931	4	314	0	0	0	0	11
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	11	12	14	14	14	11	11	11
Total Lost time (s)					5.3		5.2					5.7
Lane Util. Factor					0.86		0.97					1.00
Frt					1.00		1.00					0.86
Flt Protected					1.00		0.95					1.00
Satd. Flow (prot)					6519		3855					1640
Flt Permitted					1.00		0.95					1.00
Satd. Flow (perm)					6519		3855					1640
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	3186	4	341	0	0	0	0	12
RTOR Reduction (vph)	0	0	0	0	0	0	298	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	3190	0	43	0	0	0	0	12
Turn Type					NA		Prot					Prot
Protected Phases					6		3					4
Permitted Phases												
Actuated Green, G (s)					52.3		10.0					1.5
Effective Green, g (s)					52.3		10.0					1.5
Actuated g/C Ratio					0.65		0.12					0.02
Clearance Time (s)					5.3		5.2					5.7
Vehicle Extension (s)					3.0		3.0					3.0
Lane Grp Cap (vph)					4261		481					30
v/s Ratio Prot					c0.49		c0.01					c0.01
v/s Ratio Perm												
v/c Ratio					0.75		0.09					0.40
Uniform Delay, d1					9.4		31.0					38.8
Progression Factor					1.00		1.01					1.00
Incremental Delay, d2					1.2		0.1					8.5
Delay (s)					10.6		31.2					47.3
Level of Service					B		C					D
Approach Delay (s)		0.0			10.6			31.2				47.3
Approach LOS		A			B			C				D
Intersection Summary												
HCM 2000 Control Delay			12.7		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)				16.2			
Intersection Capacity Utilization			85.5%		ICU Level of Service				E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 1704: NB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]

Project Panda
 2032 No Build - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↑↑↑		↑	↑↑					
Traffic Volume (vph)	0	0	0	0	178	482	484	638	0	0	0	0	
Future Volume (vph)	0	0	0	0	178	482	484	638	0	0	0	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	12	12	12	12	12	12	14	12	12	12	12	12	
Total Lost time (s)					5.7		5.5	5.5					
Lane Util. Factor					0.91		0.91	0.91					
Frt					0.89		1.00	1.00					
Flt Protected					1.00		0.95	0.99					
Satd. Flow (prot)					4766		1808	3540					
Flt Permitted					1.00		0.95	0.99					
Satd. Flow (perm)					4766		1808	3540					
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	0	193	524	526	693	0	0	0	0	
RTOR Reduction (vph)	0	0	0	0	211	0	122	19	0	0	0	0	
Lane Group Flow (vph)	0	0	0	0	506	0	272	806	0	0	0	0	
Turn Type					NA		Split	NA					
Protected Phases					6		5	5					
Permitted Phases													
Actuated Green, G (s)					17.3		51.5	51.5					
Effective Green, g (s)					17.3		51.5	51.5					
Actuated g/C Ratio					0.22		0.64	0.64					
Clearance Time (s)					5.7		5.5	5.5					
Lane Grp Cap (vph)					1030		1163	2278					
v/s Ratio Prot					c0.11		0.15	c0.23					
v/s Ratio Perm													
v/c Ratio					0.91dr		0.23	0.35					
Uniform Delay, d1					27.5		6.0	6.6					
Progression Factor					1.43		0.01	0.27					
Incremental Delay, d2					1.3		0.4	0.3					
Delay (s)					40.5		0.4	2.1					
Level of Service					D		A	A					
Approach Delay (s)		0.0			40.5			1.6			0.0		
Approach LOS		A			D			A			A		
Intersection Summary													
HCM 2000 Control Delay			16.0		HCM 2000 Level of Service				B				
HCM 2000 Volume to Capacity ratio			0.39										
Actuated Cycle Length (s)			80.0		Sum of lost time (s)				11.2				
Intersection Capacity Utilization			60.5%		ICU Level of Service				B				
Analysis Period (min)			15										
dr Defacto Right Lane. Recode with 1 though lane as a right lane.													
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
 1904: SB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2032 No Build - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑↑								↘	↙↑		
Traffic Volume (vph)	0	492	193	0	0	0	0	0	0	428	274	0	
Future Volume (vph)	0	492	193	0	0	0	0	0	0	428	274	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	11	11	11	12	12	12	12	12	12	16	14	14	
Total Lost time (s)		5.8								5.5	5.5		
Lane Util. Factor		0.91								0.91	0.91		
Frt		0.96								1.00	1.00		
Flt Protected		1.00								0.95	0.98		
Satd. Flow (prot)		4956								1921	3729		
Flt Permitted		1.00								0.95	0.98		
Satd. Flow (perm)		4956								1921	3729		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	535	210	0	0	0	0	0	0	465	298	0	
RTOR Reduction (vph)	0	88	0	0	0	0	0	0	0	17	17	0	
Lane Group Flow (vph)	0	657	0	0	0	0	0	0	0	234	495	0	
Turn Type		NA								Split	NA		
Protected Phases		12								11	11		
Permitted Phases													
Actuated Green, G (s)		18.2								50.5	50.5		
Effective Green, g (s)		18.2								50.5	50.5		
Actuated g/C Ratio		0.23								0.63	0.63		
Clearance Time (s)		5.8								5.5	5.5		
Lane Grp Cap (vph)		1127								1212	2353		
v/s Ratio Prot		c0.13								0.12	c0.13		
v/s Ratio Perm													
v/c Ratio		0.58								0.19	0.21		
Uniform Delay, d1		27.5								6.2	6.3		
Progression Factor		1.00								0.15	0.23		
Incremental Delay, d2		2.2								0.3	0.2		
Delay (s)		29.7								1.2	1.6		
Level of Service		C								A	A		
Approach Delay (s)		29.7			0.0			0.0			1.5		
Approach LOS		C			A			A			A		
Intersection Summary													
HCM 2000 Control Delay			15.4		HCM 2000 Level of Service						B		
HCM 2000 Volume to Capacity ratio			0.31										
Actuated Cycle Length (s)			80.0		Sum of lost time (s)					11.3			
Intersection Capacity Utilization			36.9%		ICU Level of Service					A			
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3945: NB M-1 [Woodward Ave] & Crossover/Site Driveway B

Project Panda
 2032 No Build - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↑↑↑↑				
Traffic Volume (vph)	0	0	0	0	18	19	0	4006	37	0	0	0
Future Volume (vph)	0	0	0	0	18	19	0	4006	37	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	16	16	16	12	12	12	12	12	12
Total Lost time (s)					9.0			5.7				
Lane Util. Factor					1.00			0.81				
Fr _t					0.93			1.00				
Fl _t Protected					1.00			1.00				
Satd. Flow (prot)					2069			7930				
Fl _t Permitted					1.00			1.00				
Satd. Flow (perm)					2069			7930				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	20	21	0	4354	40	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	41	0	0	4392	0	0	0	0
Turn Type					NA			NA				
Protected Phases					4			2				
Permitted Phases												
Actuated Green, G (s)					23.0			62.3				
Effective Green, g (s)					23.0			62.3				
Actuated g/C Ratio					0.23			0.62				
Clearance Time (s)					9.0			5.7				
Lane Grp Cap (vph)					475			4940				
v/s Ratio Prot					c0.02			c0.55				
v/s Ratio Perm												
v/c Ratio					0.09			0.89				
Uniform Delay, d ₁					30.2			15.9				
Progression Factor					1.00			1.00				
Incremental Delay, d ₂					0.4			2.8				
Delay (s)					30.6			18.7				
Level of Service					C			B				
Approach Delay (s)		0.0			30.6			18.7			0.0	
Approach LOS		A			C			B			A	

Intersection Summary

HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.7
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3045: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 No Build - PM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶					↑↑↑↑
Traffic Volume (vph)	18	0	0	0	0	1695
Future Volume (vph)	18	0	0	0	0	1695
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	16	12	12	12	12	12
Total Lost time (s)	6.0					5.7
Lane Util. Factor	1.00					0.81
Frt	1.00					1.00
Flt Protected	0.95					1.00
Satd. Flow (prot)	2111					7941
Flt Permitted	0.95					1.00
Satd. Flow (perm)	2111					7941
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	0	0	0	0	1842
RTOR Reduction (vph)	14	0	0	0	0	0
Lane Group Flow (vph)	6	0	0	0	0	1842
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Actuated Green, G (s)	26.0					62.3
Effective Green, g (s)	26.0					62.3
Actuated g/C Ratio	0.26					0.62
Clearance Time (s)	6.0					5.7
Lane Grp Cap (vph)	548					4947
v/s Ratio Prot	c0.00					c0.23
v/s Ratio Perm						
v/c Ratio	0.01					0.37
Uniform Delay, d1	27.5					9.3
Progression Factor	0.00					1.00
Incremental Delay, d2	0.0					0.2
Delay (s)	0.0					9.5
Level of Service	A					A
Approach Delay (s)	0.0		0.0		9.5	
Approach LOS	A		A		A	

Intersection Summary

HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.7
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2944: NB M-1 [Woodward Ave] & Crossover/W State Fair Ave

Project Panda
 2032 No Build - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					←			↑↑↑↑					
Traffic Volume (vph)	0	0	0	0	87	181	0	3863	90	0	0	0	
Future Volume (vph)	0	0	0	0	87	181	0	3863	90	0	0	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	16	16	16	13	13	13	12	12	11	12	12	12	
Total Lost time (s)					8.8			5.2					
Lane Util. Factor					1.00			0.81					
Frbp, ped/bikes					0.99			1.00					
Flpb, ped/bikes					1.00			1.00					
Frt					0.91			1.00					
Flt Protected					1.00			1.00					
Satd. Flow (prot)					1787			7987					
Flt Permitted					1.00			1.00					
Satd. Flow (perm)					1787			7987					
Peak-hour factor, PHF	0.50	0.50	0.50	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	0	0	0	0	94	195	0	4066	95	0	0	0	
RTOR Reduction (vph)	0	0	0	0	0	0	0	3	0	0	0	0	
Lane Group Flow (vph)	0	0	0	0	289	0	0	4158	0	0	0	0	
Confl. Peds. (#/hr)	5						5		23	23			
Confl. Bikes (#/hr)									1				
Heavy Vehicles (%)	0%	0%	0%	1%	1%	5%	0%	1%	0%	0%	0%	0%	
Turn Type					NA			NA					
Protected Phases					4			2					
Permitted Phases													
Actuated Green, G (s)					22.2			83.8					
Effective Green, g (s)					22.2			83.8					
Actuated g/C Ratio					0.18			0.70					
Clearance Time (s)					8.8			5.2					
Lane Grp Cap (vph)					330			5577					
v/s Ratio Prot					c0.16			c0.52					
v/s Ratio Perm													
v/c Ratio					0.88			0.75					
Uniform Delay, d1					47.6			11.4					
Progression Factor					1.00			1.00					
Incremental Delay, d2					26.2			0.9					
Delay (s)					73.7			12.3					
Level of Service					E			B					
Approach Delay (s)		0.0			73.7			12.3			0.0		
Approach LOS		A			E			B			A		
Intersection Summary													
HCM 2000 Control Delay			16.3		HCM 2000 Level of Service				B				
HCM 2000 Volume to Capacity ratio			0.77										
Actuated Cycle Length (s)			120.0		Sum of lost time (s)				14.0				
Intersection Capacity Utilization			70.7%		ICU Level of Service				C				
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
 2044: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 No Build - PM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶					↑↑↑↑
Traffic Volume (vph)	87	0	0	0	0	1712
Future Volume (vph)	87	0	0	0	0	1712
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	16	16	12	12	10	12
Total Lost time (s)	5.8					5.2
Lane Util. Factor	1.00					0.81
Frpb, ped/bikes	1.00					1.00
Flpb, ped/bikes	1.00					1.00
Fr _t	1.00					1.00
Fl _t Protected	0.95					1.00
Satd. Flow (prot)	2132					7941
Fl _t Permitted	0.95					1.00
Satd. Flow (perm)	2132					7941
Peak-hour factor, PHF	0.95	0.95	0.92	0.92	0.50	0.95
Adj. Flow (vph)	92	0	0	0	0	1802
RTOR Reduction (vph)	24	0	0	0	0	0
Lane Group Flow (vph)	68	0	0	0	0	1802
Confl. Peds. (#/hr)	5	5		23	23	
Heavy Vehicles (%)	1%	0%	0%	0%	0%	2%
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Actuated Green, G (s)	25.2					83.8
Effective Green, g (s)	25.2					83.8
Actuated g/C Ratio	0.21					0.70
Clearance Time (s)	5.8					5.2
Lane Grp Cap (vph)	447					5545
v/s Ratio Prot	c0.03					c0.23
v/s Ratio Perm						
v/c Ratio	0.15					0.32
Uniform Delay, d ₁	38.7					7.1
Progression Factor	0.00					0.49
Incremental Delay, d ₂	0.3					0.1
Delay (s)	0.3					3.6
Level of Service	A					A
Approach Delay (s)	0.3		0.0		3.6	
Approach LOS	A		A		A	
Intersection Summary						
HCM 2000 Control Delay			3.5		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.29			
Actuated Cycle Length (s)			120.0		Sum of lost time (s)	14.0
Intersection Capacity Utilization			70.7%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis
 9006: Ralston St/Site Driveway C & W State Fair Ave

Project Panda
 2032 No Build - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	0	90	0	0	248	0	20	0	12	1	1	0
Future Volume (Veh/h)	0	90	0	0	248	0	20	0	12	1	1	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	98	0	0	270	0	22	0	13	1	1	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		772										
pX, platoon unblocked												
vC, conflicting volume	270			98			368	368	98	381	368	270
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	270			98			368	368	98	381	368	270
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			96	100	99	100	100	100
cM capacity (veh/h)	1293			1495			587	561	958	569	561	769
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	98	270	35	2								
Volume Left	0	0	22	1								
Volume Right	0	0	13	0								
cSH	1293	1700	686	565								
Volume to Capacity	0.00	0.16	0.05	0.00								
Queue Length 95th (ft)	0	0	4	0								
Control Delay (s)	0.0	0.0	10.5	11.4								
Lane LOS			B	B								
Approach Delay (s)	0.0	0.0	10.5	11.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.0									
Intersection Capacity Utilization			22.4%		ICU Level of Service				A			
Analysis Period (min)			15									

Used pseudo SBL volume of 1 to generate delay for this movement.
 Used pseudo SBT volume of 1 to prevent fatal error from occurring in SimTraffic.

HCM Signalized Intersection Capacity Analysis
1059: John R St & W State Fair Ave

Project Panda
2032 No Build - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	18	112	13	86	304	68	58	266	77	62	187	30	
Future Volume (vph)	18	112	13	86	304	68	58	266	77	62	187	30	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	10	11	11	10	12	12	10	12	12	10	12	12	
Total Lost time (s)	5.9	5.9		5.9	5.9		5.3	5.3		5.3	5.3		
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Frt	1.00	0.98		1.00	0.97		1.00	0.97		1.00	0.98		
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1542	1887		1773	1907		1612	1894		1772	1900		
Flt Permitted	0.42	1.00		0.67	1.00		0.60	1.00		0.45	1.00		
Satd. Flow (perm)	681	1887		1249	1907		1020	1894		836	1900		
Peak-hour factor, PHF	0.90	0.90	0.90	0.88	0.88	0.88	0.88	0.88	0.88	0.85	0.85	0.85	
Adj. Flow (vph)	20	124	14	98	345	77	66	302	88	73	220	35	
RTOR Reduction (vph)	0	8	0	0	16	0	0	21	0	0	12	0	
Lane Group Flow (vph)	20	130	0	98	406	0	66	369	0	73	243	0	
Confl. Peds. (#/hr)									1	1			
Heavy Vehicles (%)	15%	1%	0%	0%	2%	2%	10%	2%	0%	0%	2%	10%	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA		
Protected Phases		4			8			2			6		
Permitted Phases	4			8			2			6			
Actuated Green, G (s)	19.1	19.1		19.1	19.1		19.7	19.7		19.7	19.7		
Effective Green, g (s)	19.1	19.1		19.1	19.1		19.7	19.7		19.7	19.7		
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.39	0.39		0.39	0.39		
Clearance Time (s)	5.9	5.9		5.9	5.9		5.3	5.3		5.3	5.3		
Lane Grp Cap (vph)	260	720		477	728		401	746		329	748		
v/s Ratio Prot		0.07			c0.21			c0.19				0.13	
v/s Ratio Perm	0.03			0.08			0.06			0.09			
v/c Ratio	0.08	0.18		0.21	0.56		0.16	0.49		0.22	0.33		
Uniform Delay, d1	9.8	10.3		10.4	12.1		9.8	11.4		10.1	10.5		
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	0.6	0.5		1.0	3.1		0.9	2.3		1.6	1.2		
Delay (s)	10.4	10.8		11.3	15.2		10.7	13.7		11.6	11.7		
Level of Service	B	B		B	B		B	B		B	B		
Approach Delay (s)		10.8			14.5			13.3			11.7		
Approach LOS		B			B			B			B		
Intersection Summary													
HCM 2000 Control Delay			13.1									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.53										
Actuated Cycle Length (s)			50.0									Sum of lost time (s)	11.2
Intersection Capacity Utilization			69.7%									ICU Level of Service	C
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

Project Panda

1404: SB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]/WB M-102 [8 Mile Srv Rd]



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations				↙	↕						↕	↘		
Traffic Volume (vph)	0	0	0	208	454	0	0	0	0	0	494	311		
Future Volume (vph)	0	0	0	208	454	0	0	0	0	0	494	311		
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000		
Lane Width	12	14	12	14	9	12	12	12	12	12	11	13		
Total Lost time (s)				5.6	5.6						5.7			
Lane Util. Factor				0.91	0.91						0.91			
Fr _t				1.00	1.00						0.94			
Fl _t Protected				0.95	1.00						1.00			
Satd. Flow (prot)				1808	3205						4875			
Fl _t Permitted				0.95	1.00						1.00			
Satd. Flow (perm)				1808	3205						4875			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Adj. Flow (vph)	0	0	0	226	493	0	0	0	0	0	537	338		
RTOR Reduction (vph)	0	0	0	17	14	0	0	0	0	0	142	0		
Lane Group Flow (vph)	0	0	0	186	502	0	0	0	0	0	733	0		
Turn Type				Split	NA						NA			
Protected Phases				10	10						9			
Permitted Phases														
Actuated Green, G (s)				50.4	50.4						18.3			
Effective Green, g (s)				50.4	50.4						18.3			
Actuated g/C Ratio				0.63	0.63						0.23			
Clearance Time (s)				5.6	5.6						5.7			
Lane Grp Cap (vph)				1139	2019						1115			
v/s Ratio Prot				0.10	c0.16						c0.15			
v/s Ratio Perm														
v/c Ratio				0.16	0.25						0.66			
Uniform Delay, d ₁				6.1	6.5						28.0			
Progression Factor				0.87	0.85						1.00			
Incremental Delay, d ₂				0.3	0.3						3.0			
Delay (s)				5.6	5.8						31.0			
Level of Service				A	A						C			
Approach Delay (s)		0.0			5.7			0.0			31.0			
Approach LOS		A			A			A			C			
Intersection Summary														
HCM 2000 Control Delay			19.6									HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio			0.36											
Actuated Cycle Length (s)			80.0								11.3		Sum of lost time (s)	
Intersection Capacity Utilization			36.9%										ICU Level of Service	A
Analysis Period (min)			15											

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1804: NB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2032 No Build - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	428	492	0	0	0	0	0	695	170	0	0	0
Future Volume (vph)	428	492	0	0	0	0	0	695	170	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	14	9	9	12	12	12	11	11	11	12	12	12
Total Lost time (s)	5.4	5.4						5.7				
Lane Util. Factor	0.91	0.91						0.91				
Frt	1.00	1.00						0.97				
Flt Protected	0.95	0.99						1.00				
Satd. Flow (prot)	1808	3179						5022				
Flt Permitted	0.95	0.99						1.00				
Satd. Flow (perm)	1808	3179						5022				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	465	535	0	0	0	0	0	755	185	0	0	0
RTOR Reduction (vph)	14	14	0	0	0	0	0	52	0	0	0	0
Lane Group Flow (vph)	311	661	0	0	0	0	0	888	0	0	0	0
Turn Type	Split	NA						NA				
Protected Phases	2	2						1				
Permitted Phases												
Actuated Green, G (s)	50.6	50.6						18.3				
Effective Green, g (s)	50.6	50.6						18.3				
Actuated g/C Ratio	0.63	0.63						0.23				
Clearance Time (s)	5.4	5.4						5.7				
Lane Grp Cap (vph)	1143	2010						1148				
v/s Ratio Prot	0.17	c0.21						c0.18				
v/s Ratio Perm												
v/c Ratio	0.27	0.33						0.77				
Uniform Delay, d1	6.5	6.8						28.9				
Progression Factor	0.45	0.46						1.00				
Incremental Delay, d2	0.5	0.4						5.1				
Delay (s)	3.5	3.5						34.0				
Level of Service	A	A						C				
Approach Delay (s)		3.5			0.0			34.0			0.0	
Approach LOS		A			A			C			A	
Intersection Summary												
HCM 2000 Control Delay			18.3					HCM 2000 Level of Service			B	
HCM 2000 Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			80.0					Sum of lost time (s)		11.2		
Intersection Capacity Utilization			53.8%					ICU Level of Service		A		
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings
 4046: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 No Build - PM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	1695
Future Volume (vph)	0	0	0	0	0	1695
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Satd. Flow (prot)	2222	0	0	0	0	7941
Flt Permitted						
Satd. Flow (perm)	2222	0	0	0	0	7941
Link Speed (mph)	25		40			40
Link Distance (ft)	108		549			765
Travel Time (s)	2.9		9.4			13.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	1842
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	54.3%
ICU Level of Service	A
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Delays on the major and minor streets should be 0 seconds as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
 4946: NB M-1 [Woodward Ave] & Crossover/State Fair Gate #5

Project Panda
 2032 No Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↑↑↑↑				
Traffic Volume (vph)	0	0	0	0	0	0	0	4025	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	4025	0	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	12	12
Satd. Flow (prot)	0	0	0	0	2222	0	0	7941	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	2222	0	0	7941	0	0	0	0
Link Speed (mph)		25			25			40				40
Link Distance (ft)		108			968			539				202
Travel Time (s)		2.9			26.4			9.2				3.4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	4375	0	0	0	0
Sign Control		Free			Stop			Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	54.3%
ICU Level of Service	A
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Delays on the major and minor streets should be 0 seconds as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
1015: Crossover/Driveway & WB M-102 [8 Mile Rd]

Project Panda
2032 No Build - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↖↗					↖
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	11	12	14	14	14	11	11	11
Storage Length (ft)	0		0	325		0	0		0	0		0
Storage Lanes	0		0	0		0	2		0	0		1
Taper Length (ft)	25			100			25			25		
Right Turn on Red			Yes			Yes	Yes		Yes			No
Link Speed (mph)		40			40			25				25
Link Distance (ft)		683			2329			96				286
Travel Time (s)		11.6			39.7			2.6				7.8
Lane Group Flow (vph)	0	0	0	0	3567	0	158	0	0	0	0	4
v/c Ratio					0.77		0.19					0.03
Control Delay					10.1		1.6					34.0
Queue Delay					0.0		0.0					0.0
Total Delay					10.1		1.6					34.0
Queue Length 50th (ft)					231		1					2
Queue Length 95th (ft)					502		7					11
Internal Link Dist (ft)		603			2249			16				206
Turn Bay Length (ft)												
Base Capacity (vph)					4638		862					211
Starvation Cap Reductn					0		0					0
Spillback Cap Reductn					0		0					0
Storage Cap Reductn					0		0					0
Reduced v/c Ratio					0.77		0.18					0.02
Intersection Summary												
Area Type:	Other											

Lanes, Volumes, Timings
 1915: EB M-102 [8 Mile Rd] & Crossover

Project Panda
 2032 No Build - AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	14	12	12	12	12	12
Storage Length (ft)	325			0	0	0
Storage Lanes	2			0	0	0
Taper Length (ft)	25				25	
Link Speed (mph)		40	40		40	
Link Distance (ft)		682	2304		96	
Travel Time (s)		11.6	39.3		1.6	
Lane Group Flow (vph)	158	2539	0	0	0	0

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 1704: NB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]

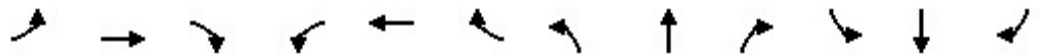
Project Panda
 2032 No Build - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↑	↑↑				
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	12	12	14	12	12	12	12	12
Storage Length (ft)	0		0	875		0	90		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		174			1335			234				818
Travel Time (s)		3.0			22.8			4.0				13.9
Lane Group Flow (vph)	0	0	0	0	686	0	289	608	0	0	0	0
v/c Ratio					0.51		0.23	0.26				
Control Delay					22.2		0.6	2.7				
Queue Delay					0.0		0.6	0.5				
Total Delay					22.2		1.1	3.1				
Queue Length 50th (ft)					82		1	30				
Queue Length 95th (ft)					119		4	36				
Internal Link Dist (ft)		94			1255			154				738
Turn Bay Length (ft)							90					
Base Capacity (vph)					1336		1253	2296				
Starvation Cap Reductn					0		613	1172				
Spillback Cap Reductn					0		0	0				
Storage Cap Reductn					0		0	0				
Reduced v/c Ratio					0.51		0.45	0.54				
Intersection Summary												
Area Type:	Other											

Lanes, Volumes, Timings
 1904: SB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2032 No Build - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑								↘	↙↑	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	11	11	11	12	12	12	12	12	12	16	14	14
Storage Length (ft)	0		900	0		0	0		0	90		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		1309			166			808				245
Travel Time (s)		22.3			2.8			13.8				4.2
Lane Group Flow (vph)	0	752	0	0	0	0	0	0	0	215	449	0
v/c Ratio		0.59								0.17	0.19	
Control Delay		21.9								0.6	1.5	
Queue Delay		0.0								0.6	0.4	
Total Delay		21.9								1.2	1.9	
Queue Length 50th (ft)		87								1	10	
Queue Length 95th (ft)		127								2	10	
Internal Link Dist (ft)		1229			86			728				165
Turn Bay Length (ft)										90		
Base Capacity (vph)		1264								1243	2397	
Starvation Cap Reductn		0								720	1387	
Spillback Cap Reductn		0								0	0	
Storage Cap Reductn		0								0	0	
Reduced v/c Ratio		0.59								0.41	0.44	
Intersection Summary												
Area Type:	Other											

Lanes, Volumes, Timings
 3945: NB M-1 [Woodward Ave] & Crossover/Site Driveway B

Project Panda
 2032 No Build - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	16	16	16	12	12	12	12	12	12
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		30			25			40				40
Link Distance (ft)		98			1019			456				523
Travel Time (s)		2.2			27.8			7.8				8.9
Lane Group Flow (vph)	0	0	0	0	41	0	0	1231	0	0	0	0
v/c Ratio					0.10			0.23				
Control Delay					25.0			4.9				
Queue Delay					0.0			0.0				
Total Delay					25.0			4.9				
Queue Length 50th (ft)					13			57				
Queue Length 95th (ft)					45			57				
Internal Link Dist (ft)		18			939			376				443
Turn Bay Length (ft)												
Base Capacity (vph)					396			5469				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			0				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.10			0.23				

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 3045: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 No Build - AM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Right Turn on Red	Yes	Yes		Yes		
Link Speed (mph)	25		40			40
Link Distance (ft)	98		813			557
Travel Time (s)	2.7		13.9			9.5
Lane Group Flow (vph)	20	0	0	0	0	4535
v/c Ratio	0.05					0.83
Control Delay	14.8					15.0
Queue Delay	0.0					0.0
Total Delay	14.8					15.0
Queue Length 50th (ft)	7					562
Queue Length 95th (ft)	8					590
Internal Link Dist (ft)	18		733			477
Turn Bay Length (ft)						
Base Capacity (vph)	439					5492
Starvation Cap Reductn	0					0
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.05					0.83

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 2944: NB M-1 [Woodward Ave] & Crossover/W State Fair Ave

Project Panda
 2032 No Build - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	16	16	13	13	13	12	12	11	12	12	12
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		25			25			40				40
Link Distance (ft)		76			457			1032				386
Travel Time (s)		2.1			12.5			17.6				6.6
Lane Group Flow (vph)	0	0	0	0	289	0	0	1105	0	0	0	0
v/c Ratio					0.74			0.20				
Control Delay					46.6			6.3				
Queue Delay					0.0			0.0				
Total Delay					46.6			6.3				
Queue Length 50th (ft)					161			64				
Queue Length 95th (ft)					#268			76				
Internal Link Dist (ft)		1			377			952				306
Turn Bay Length (ft)												
Base Capacity (vph)					393			5392				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			0				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.74			0.20				

Intersection Summary

Area Type: Other
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
 2044: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 No Build - AM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	16	12	12	10	12
Storage Length (ft)	30	0		0	0	
Storage Lanes	0	0		0	0	
Taper Length (ft)	25				25	
Right Turn on Red	Yes	Yes		Yes		
Link Speed (mph)	25		40			40
Link Distance (ft)	76		1017			813
Travel Time (s)	2.1		17.3			13.9
Lane Group Flow (vph)	98	0	0	0	0	4411
v/c Ratio	0.22					0.79
Control Delay	9.7					4.3
Queue Delay	0.0					0.0
Total Delay	9.7					4.3
Queue Length 50th (ft)	16					100
Queue Length 95th (ft)	m16					102
Internal Link Dist (ft)	1		937			733
Turn Bay Length (ft)	30					
Base Capacity (vph)	452					5600
Starvation Cap Reductn	0					47
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.22					0.79

Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↗			↕			↕	
Traffic Vol, veh/h	0	55	0	0	245	0	15	0	11	1	1	0
Future Vol, veh/h	0	55	0	0	245	0	15	0	11	1	1	0
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	60	0	0	266	0	16	0	12	1	1	0

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	266	0	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	-
Pot Cap-1 Maneuver	1298	-	0	0
Stage 1	-	-	0	0
Stage 2	-	-	0	0
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1298	-	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-





















Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	10	11
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	744	1298	-	-	-	603
HCM Lane V/C Ratio	0.038	-	-	-	-	0.004
HCM Control Delay (s)	10	0	-	-	-	11
HCM Lane LOS	B	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	-	0

Used pseudo SBL volume of 1 to display delay for that turning movement.
 Used pseudo SBT volume of 1 to prevent fatal error from occurring in SimTraffic.

Lanes, Volumes, Timings
1059: John R St & W State Fair Ave

Project Panda
2032 No Build - AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	10	11	11	10	12	12	10	12	12	10	12	12
Storage Length (ft)	50		0	50		0	70		0	70		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1146			1401			1021			1264	
Travel Time (s)		26.0			31.8			23.2			28.7	
Lane Group Flow (vph)	11	52	0	37	206	0	15	115	0	15	142	0
v/c Ratio	0.03	0.08		0.07	0.28		0.03	0.15		0.03	0.20	
Control Delay	10.1	9.6		10.4	10.9		9.7	8.8		9.6	10.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.1	9.6		10.4	10.9		9.7	8.8		9.6	10.1	
Queue Length 50th (ft)	2	8		7	36		3	16		3	24	
Queue Length 95th (ft)	9	23		17	59		11	40		11	50	
Internal Link Dist (ft)		1066			1321			941			1184	
Turn Bay Length (ft)	50			50			70			70		
Base Capacity (vph)	345	693		515	731		448	748		460	705	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.03	0.08		0.07	0.28		0.03	0.15		0.03	0.20	
Intersection Summary												
Area Type:	Other											

Lanes, Volumes, Timings

1404: SB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]/WB M-102 [8 Mile Srv Rd]



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	14	12	14	9	12	12	12	12	12	11	13
Storage Length (ft)	0		0	110		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Link Speed (mph)		40			40			40			40	
Link Distance (ft)		1243			174			245			469	
Travel Time (s)		21.2			3.0			4.2			8.0	
Lane Group Flow (vph)	0	0	0	195	409	0	0	0	0	0	716	0
v/c Ratio				0.17	0.20						0.57	
Control Delay				4.6	6.8						21.5	
Queue Delay				1.3	0.9						0.0	
Total Delay				5.9	7.7						21.5	
Queue Length 50th (ft)				4	40						82	
Queue Length 95th (ft)				39	63						120	
Internal Link Dist (ft)		1163			94			165			389	
Turn Bay Length (ft)				110								
Base Capacity (vph)				1172	2029						1264	
Starvation Cap Reductn				784	1307						0	
Spillback Cap Reductn				0	0						0	
Storage Cap Reductn				0	0						0	
Reduced v/c Ratio				0.50	0.57						0.57	

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 1804: NB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2032 No Build - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	14	9	9	12	12	12	11	11	11	12	12	12
Storage Length (ft)	110		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		166			921			1294				234
Travel Time (s)		2.8			15.7			22.1				4.0
Lane Group Flow (vph)	260	532	0	0	0	0	0	700	0	0	0	0
v/c Ratio	0.22	0.26						0.57				
Control Delay	2.1	2.8						24.2				
Queue Delay	1.3	0.8						0.0				
Total Delay	3.4	3.5						24.2				
Queue Length 50th (ft)	15	22						91				
Queue Length 95th (ft)	30	33						129				
Internal Link Dist (ft)		86			841			1214				154
Turn Bay Length (ft)	110											
Base Capacity (vph)	1167	2026						1228				
Starvation Cap Reductn	697	1126						0				
Spillback Cap Reductn	0	0						0				
Storage Cap Reductn	0	0						0				
Reduced v/c Ratio	0.55	0.59						0.57				

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 2915: Market Place Dr/Crossover & EB M-102 [8 Mile Rd]

Project Panda
 2032 No Build - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑	↗						↖↖	↘	↑	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	14	12	12	12	12	12	11	16	16	16
Storage Length (ft)	0		280	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		2	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			No	No		Yes
Link Speed (mph)		40			40			25				40
Link Distance (ft)		331			682			497				87
Travel Time (s)		5.6			11.6			13.6				1.5
Lane Group Flow (vph)	0	2551	60	0	0	0	0	0	61	85	73	0
v/c Ratio		0.43	0.04						0.38	0.57	0.46	
Control Delay		4.7	0.8						79.4	74.8	70.3	
Queue Delay		0.0	0.0						0.0	0.0	0.0	
Total Delay		4.7	0.8						79.4	74.8	70.3	
Queue Length 50th (ft)		124	0						35	87	75	
Queue Length 95th (ft)		144	m6						64	m108	m91	
Internal Link Dist (ft)		251			602			417				7
Turn Bay Length (ft)			280									
Base Capacity (vph)		6132	1387						248	184	194	
Starvation Cap Reductn		0	0						0	0	0	
Spillback Cap Reductn		0	0						0	0	0	
Storage Cap Reductn		0	0						0	0	0	
Reduced v/c Ratio		0.42	0.04						0.25	0.46	0.38	

Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	16	12	12	12
Storage Length (ft)		0	230		0	0
Storage Lanes		0	2		0	0
Taper Length (ft)			25		25	
Link Speed (mph)	40			40	40	
Link Distance (ft)	310			683	87	
Travel Time (s)	5.3			11.6	1.5	
Lane Group Flow (vph)	0	0	158	3558	0	0

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 4046: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 No Build - AM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔					↑↑↑↑
Traffic Volume (vph)	0	0	0	0	0	4172
Future Volume (vph)	0	0	0	0	0	4172
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Satd. Flow (prot)	2222	0	0	0	0	7941
Flt Permitted						
Satd. Flow (perm)	2222	0	0	0	0	7941
Link Speed (mph)	25		40			40
Link Distance (ft)	104		557			758
Travel Time (s)	2.8		9.5			12.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	4535
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.9%
ICU Level of Service	B
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Queues on the major and minor streets should be 0 FT as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
 4946: NB M-1 [Woodward Ave] & Crossover/State Fair Gate #5

Project Panda
 2032 No Build - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	0	1115	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	1115	0	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	12	12
Satd. Flow (prot)	0	0	0	0	2222	0	0	7941	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	2222	0	0	7941	0	0	0	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		104			979			523			218	
Travel Time (s)		2.8			26.7			8.9			3.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	1212	0	0	0	0
Sign Control		Free			Stop			Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.9%
ICU Level of Service	B
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Queues on the major and minor streets should be 0 FT as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
 1015: Crossover/Driveway & WB M-102 [8 Mile Rd]

Project Panda
 2032 No Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↘↘					↗
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	11	12	14	14	14	11	11	11
Storage Length (ft)	0		0	325		0	0		0	0		0
Storage Lanes	0		0	0		0	2		0	0		1
Taper Length (ft)	25			100			25			25		
Right Turn on Red			Yes			Yes	Yes		Yes			No
Link Speed (mph)		40			40			25				25
Link Distance (ft)		694			2329			96				286
Travel Time (s)		11.8			39.7			2.6				7.8
Lane Group Flow (vph)	0	0	0	0	3190	0	341	0	0	0	0	12
v/c Ratio					0.69		0.43					0.08
Control Delay					8.4		8.3					34.9
Queue Delay					0.0		0.0					0.0
Total Delay					8.4		8.3					34.9
Queue Length 50th (ft)					183		6					6
Queue Length 95th (ft)					404		m25					21
Internal Link Dist (ft)		614			2249			16				206
Turn Bay Length (ft)												
Base Capacity (vph)					4635		837					211
Starvation Cap Reductn					0		0					0
Spillback Cap Reductn					0		0					0
Storage Cap Reductn					0		0					0
Reduced v/c Ratio					0.69		0.41					0.06

Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
 1915: EB M-102 [8 Mile Rd] & Crossover

Project Panda
 2032 No Build - PM Peak Hour






















Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	14	12	12	12	12	12
Storage Length (ft)	325			0	0	0
Storage Lanes	2			0	0	0
Taper Length (ft)	25				25	
Link Speed (mph)		40	40		40	
Link Distance (ft)		690	2304		96	
Travel Time (s)		11.8	39.3		1.6	
Lane Group Flow (vph)	341	3068	0	0	0	0

Intersection Summary	
Area Type:	Other

Lanes, Volumes, Timings
 1704: NB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]

Project Panda
 2032 No Build - PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  		 	 				
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	12	12	14	12	12	12	12	12
Storage Length (ft)	0		0	875		0	90		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		174			1335			234				818
Travel Time (s)		3.0			22.8			4.0				13.9
Lane Group Flow (vph)	0	0	0	0	717	0	394	825	0	0	0	0
v/c Ratio					0.91dr		0.31	0.36				
Control Delay					26.3		0.5	2.0				
Queue Delay					0.0		0.8	0.8				
Total Delay					26.3		1.3	2.9				
Queue Length 50th (ft)					103		0	28				
Queue Length 95th (ft)					130		m0	36				
Internal Link Dist (ft)		94			1255			154				738
Turn Bay Length (ft)							90					
Base Capacity (vph)					1241		1286	2297				
Starvation Cap Reductn					0		577	1096				
Spillback Cap Reductn					0		0	0				
Storage Cap Reductn					0		0	0				
Reduced v/c Ratio					0.58		0.56	0.69				

Intersection Summary

Area Type: Other
 m Volume for 95th percentile queue is metered by upstream signal.
 dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lanes, Volumes, Timings
 1904: SB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2032 No Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑								↘	↙↑	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	11	11	11	12	12	12	12	12	12	16	14	14
Storage Length (ft)	0		900	0		0	0		0	90		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		1292			166			808				245
Travel Time (s)		22.0			2.8			13.8				4.2
Lane Group Flow (vph)	0	745	0	0	0	0	0	0	0	251	512	0
v/c Ratio		0.61								0.20	0.22	
Control Delay		25.8								1.1	1.5	
Queue Delay		0.0								0.9	0.5	
Total Delay		25.8								2.0	2.0	
Queue Length 50th (ft)		103								6	11	
Queue Length 95th (ft)		142								9	12	
Internal Link Dist (ft)		1212			86			728				165
Turn Bay Length (ft)										90		
Base Capacity (vph)		1215								1229	2371	
Starvation Cap Reductn		0								715	1377	
Spillback Cap Reductn		0								0	0	
Storage Cap Reductn		0								0	0	
Reduced v/c Ratio		0.61								0.49	0.52	

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 3945: NB M-1 [Woodward Ave] & Crossover/Site Driveway B

Project Panda
 2032 No Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	16	16	16	12	12	12	12	12	12
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		30			25			40				40
Link Distance (ft)		98			1019			413				539
Travel Time (s)		2.2			27.8			7.0				9.2
Lane Group Flow (vph)	0	0	0	0	41	0	0	4394	0	0	0	0
v/c Ratio					0.09			0.89				
Control Delay					30.9			18.9				
Queue Delay					0.0			0.0				
Total Delay					30.9			18.9				
Queue Length 50th (ft)					21			535				
Queue Length 95th (ft)					49			578				
Internal Link Dist (ft)		18			939			333				459
Turn Bay Length (ft)												
Base Capacity (vph)					475			4943				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			0				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.09			0.89				

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 3045: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 No Build - PM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Right Turn on Red	Yes	Yes		Yes		
Link Speed (mph)	25		40			40
Link Distance (ft)	98		411			549
Travel Time (s)	2.7		7.0			9.4
Lane Group Flow (vph)	20	0	0	0	0	1842
v/c Ratio	0.04					0.37
Control Delay	0.1					9.5
Queue Delay	0.0					0.0
Total Delay	0.1					9.5
Queue Length 50th (ft)	0					130
Queue Length 95th (ft)	0					149
Internal Link Dist (ft)	18		331			469
Turn Bay Length (ft)						
Base Capacity (vph)	562					4947
Starvation Cap Reductn	0					0
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.04					0.37

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 2944: NB M-1 [Woodward Ave] & Crossover/W State Fair Ave

Project Panda
 2032 No Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	16	16	13	13	13	12	12	11	12	12	12
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		25			25			40				40
Link Distance (ft)		76			772			1032				430
Travel Time (s)		2.1			21.1			17.6				7.3
Lane Group Flow (vph)	0	0	0	0	289	0	0	4161	0	0	0	0
v/c Ratio					0.88			0.75				
Control Delay					74.4			12.4				
Queue Delay					0.0			0.0				
Total Delay					74.4			12.4				
Queue Length 50th (ft)					220			449				
Queue Length 95th (ft)					#375			474				
Internal Link Dist (ft)		1			692			952				350
Turn Bay Length (ft)												
Base Capacity (vph)					330			5583				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			0				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.88			0.75				

Intersection Summary

Area Type: Other
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
 2044: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 No Build - PM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	16	12	12	10	12
Storage Length (ft)	30	0		0	0	
Storage Lanes	0	0		0	0	
Taper Length (ft)	25				25	
Right Turn on Red	Yes	Yes		Yes		
Link Speed (mph)	25		40			40
Link Distance (ft)	76		1017			403
Travel Time (s)	2.1		17.3			6.9
Lane Group Flow (vph)	92	0	0	0	0	1802
v/c Ratio	0.20					0.32
Control Delay	0.4					7.2
Queue Delay	0.0					0.0
Total Delay	0.4					7.2
Queue Length 50th (ft)	0					120
Queue Length 95th (ft)	m0					135
Internal Link Dist (ft)	1		937			323
Turn Bay Length (ft)	30					
Base Capacity (vph)	471					5545
Starvation Cap Reductn	0					0
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.20					0.32

Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.

Intersection

Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	90	0	0	248	0	20	0	12	1	1	0
Future Vol, veh/h	0	90	0	0	248	0	20	0	12	1	1	0
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	98	0	0	270	0	22	0	13	1	1	0

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	270	0	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	-
Pot Cap-1 Maneuver	1293	-	0	0
Stage 1	-	-	0	0
Stage 2	-	-	0	0
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1293	-	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-





















Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	10.5	11.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	687	1293	-	-	-	567
HCM Lane V/C Ratio	0.051	-	-	-	-	0.004
HCM Control Delay (s)	10.5	0	-	-	-	11.4
HCM Lane LOS	B	A	-	-	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	-	0

Used pseudo SBL volume of 1 to display delay for that turning movement.
 Used pseudo SBT volume of 1 to prevent fatal error from occurring in SimTraffic.

Lanes, Volumes, Timings
1059: John R St & W State Fair Ave

Project Panda
2032 No Build - PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	10	11	11	10	12	12	10	12	12	10	12	12
Storage Length (ft)	50		0	50		0	70		0	70		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1144			1401			1021			1264	
Travel Time (s)		26.0			31.8			23.2			28.7	
Lane Group Flow (vph)	20	138	0	98	422	0	66	390	0	73	255	0
v/c Ratio	0.08	0.19		0.21	0.57		0.16	0.51		0.22	0.34	
Control Delay	10.9	10.2		11.8	15.0		11.2	13.2		12.3	11.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.9	10.2		11.8	15.0		11.2	13.2		12.3	11.3	
Queue Length 50th (ft)	4	23		18	87		12	74		14	46	
Queue Length 95th (ft)	14	52		43	152		32	132		34	82	
Internal Link Dist (ft)		1064			1321			941			1184	
Turn Bay Length (ft)	50			50			70			70		
Base Capacity (vph)	260	728		477	744		401	767		329	759	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.08	0.19		0.21	0.57		0.16	0.51		0.22	0.34	
Intersection Summary												
Area Type:	Other											

Lanes, Volumes, Timings

1404: SB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]/WB M-102 [8 Mile Srv Rd]



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	14	12	14	9	12	12	12	12	12	11	13
Storage Length (ft)	0		0	110		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		1243			174			245				473
Travel Time (s)		21.2			3.0			4.2				8.1
Lane Group Flow (vph)	0	0	0	203	516	0	0	0	0	0	875	0
v/c Ratio				0.18	0.25							0.70
Control Delay				4.3	5.4							25.5
Queue Delay				1.2	0.7							0.0
Total Delay				5.4	6.1							25.5
Queue Length 50th (ft)				26	42							115
Queue Length 95th (ft)				48	60							159
Internal Link Dist (ft)		1163			94			165				393
Turn Bay Length (ft)				110								
Base Capacity (vph)				1156	2032							1256
Starvation Cap Reductn				744	1130							0
Spillback Cap Reductn				0	0							0
Storage Cap Reductn				0	0							0
Reduced v/c Ratio				0.49	0.57							0.70

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 1804: NB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2032 No Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	14	9	9	12	12	12	11	11	11	12	12	12
Storage Length (ft)	110		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		166			985			1294				234
Travel Time (s)		2.8			16.8			22.1				4.0
Lane Group Flow (vph)	325	675	0	0	0	0	0	940	0	0	0	0
v/c Ratio	0.28	0.33						0.78				
Control Delay	3.2	3.4						32.2				
Queue Delay	1.5	0.8						0.0				
Total Delay	4.7	4.2						32.2				
Queue Length 50th (ft)	20	25						150				
Queue Length 95th (ft)	51	50						197				
Internal Link Dist (ft)		86			905			1214				154
Turn Bay Length (ft)	110											
Base Capacity (vph)	1157	2024						1200				
Starvation Cap Reductn	631	991						0				
Spillback Cap Reductn	0	0						0				
Storage Cap Reductn	0	0						0				
Reduced v/c Ratio	0.62	0.65						0.78				

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 2915: Market Place Dr/Crossover & EB M-102 [8 Mile Rd]

Project Panda
 2032 No Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑	↗						↖↖	↘	↑	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	14	12	12	12	12	12	11	16	16	16
Storage Length (ft)	0		280	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		2	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			No	No		Yes
Link Speed (mph)		40			40			25				40
Link Distance (ft)		271			690			416				93
Travel Time (s)		4.6			11.8			11.3				1.6
Lane Group Flow (vph)	0	3103	129	0	0	0	0	0	228	78	125	0
v/c Ratio		0.57	0.10						0.92	0.46	0.71	
Control Delay		7.1	1.0						110.8	74.4	85.3	
Queue Delay		0.0	0.0						0.0	0.0	0.0	
Total Delay		7.1	1.0						110.8	74.4	85.3	
Queue Length 50th (ft)		176	0						136	78	128	
Queue Length 95th (ft)		184	m10						#230	m111	m187	
Internal Link Dist (ft)		191			610			336				13
Turn Bay Length (ft)			280									
Base Capacity (vph)		5401	1250						248	184	194	
Starvation Cap Reductn		0	0						0	0	0	
Spillback Cap Reductn		0	0						0	0	0	
Storage Cap Reductn		0	0						0	0	0	
Reduced v/c Ratio		0.57	0.10						0.92	0.42	0.64	

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	16	12	12	12
Storage Length (ft)		0	230		0	0
Storage Lanes		0	2		0	0
Taper Length (ft)			25		25	
Link Speed (mph)	40			40	40	
Link Distance (ft)	299			694	93	
Travel Time (s)	5.1			11.8	1.6	
Lane Group Flow (vph)	0	0	203	3336	0	0

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 4046: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 No Build - PM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	1695
Future Volume (vph)	0	0	0	0	0	1695
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Satd. Flow (prot)	2222	0	0	0	0	7941
Flt Permitted						
Satd. Flow (perm)	2222	0	0	0	0	7941
Link Speed (mph)	25		40			40
Link Distance (ft)	108		549			765
Travel Time (s)	2.9		9.4			13.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	1842
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	54.3%
ICU Level of Service	A
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Queues on the major and minor streets should be 0 FT as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
 4946: NB M-1 [Woodward Ave] & Crossover/State Fair Gate #5

Project Panda
 2032 No Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↑↑↑↑↔				
Traffic Volume (vph)	0	0	0	0	0	0	0	4025	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	4025	0	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	12	12
Satd. Flow (prot)	0	0	0	0	2222	0	0	7941	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	2222	0	0	7941	0	0	0	0
Link Speed (mph)		25			25			40				40
Link Distance (ft)		108			968			539				202
Travel Time (s)		2.9			26.4			9.2				3.4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	4375	0	0	0	0
Sign Control		Free			Stop			Free				Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	54.3%
ICU Level of Service	A
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Queues on the major and minor streets should be 0 FT as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

APPENDIX – I

2022 Phase I Build Capacity Analysis

HCM Signalized Intersection Capacity Analysis
 1915: Site Driveway A/Crossover & 8 Mile Srv Rd (EB)

Project Panda
 2022 Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖ ↗	↑ ↑ ↑ ↑						↑	↖ ↗		↖ ↗	
Traffic Volume (vph)	137	2130	116	0	0	0	0	23	47	0	121	0
Future Volume (vph)	137	2130	116	0	0	0	0	23	47	0	121	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	14	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	8.3	5.7						5.2	5.2		5.7	
Lane Util. Factor	0.97	0.81						1.00	1.00		0.95	
Frt	1.00	0.99						1.00	0.85		1.00	
Flt Protected	0.95	1.00						1.00	1.00		1.00	
Satd. Flow (prot)	3855	7880						1961	1667		3725	
Flt Permitted	0.95	1.00						1.00	1.00		1.00	
Satd. Flow (perm)	3855	7880						1961	1667		3725	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	149	2315	126	0	0	0	0	25	51	0	132	0
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	45	0	0	0
Lane Group Flow (vph)	149	2426	0	0	0	0	0	25	6	0	132	0
Turn Type	Prot	NA						NA	Perm		NA	
Protected Phases	7	5 7						8		6	6	
Permitted Phases									8			
Actuated Green, G (s)	10.7	41.3						8.8	8.8		13.3	
Effective Green, g (s)	10.7	33.0						8.8	8.8		13.3	
Actuated g/C Ratio	0.13	0.41						0.11	0.11		0.17	
Clearance Time (s)	8.3							5.2	5.2		5.7	
Lane Grp Cap (vph)	515	3250						215	183		619	
v/s Ratio Prot	0.04	c0.31						c0.01			c0.04	
v/s Ratio Perm									0.00			
v/c Ratio	0.29	0.75						0.12	0.03		0.21	
Uniform Delay, d1	31.2	19.9						32.1	31.8		28.8	
Progression Factor	1.01	0.72						1.00	1.00		0.00	
Incremental Delay, d2	1.3	1.5						1.1	0.3		0.8	
Delay (s)	33.0	15.9						33.2	32.1		0.8	
Level of Service	C	B						C	C		A	
Approach Delay (s)		16.9			0.0			32.5			0.8	
Approach LOS		B			A			C			A	

Intersection Summary		
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.55	B
Actuated Cycle Length (s)	80.0	Sum of lost time (s)
Intersection Capacity Utilization	91.8%	27.9
Analysis Period (min)	15	ICU Level of Service
		F

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1015: Crossover/Driveway & E 8 Mile Rd (WB)

Project Panda
 2022 Build - AM Peak Hour

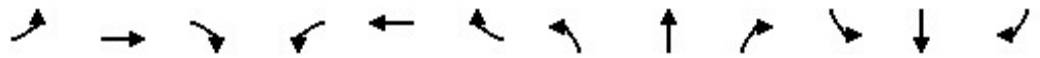


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	0	0	0	121	2983	12	160	0	0	0	0	4	
Future Volume (vph)	0	0	0	121	2983	12	160	0	0	0	0	4	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	12	12	12	12	11	12	14	14	14	11	11	11	
Total Lost time (s)				8.7	5.7		5.3					5.3	
Lane Util. Factor				0.97	0.86		0.97					1.00	
Flt				1.00	1.00		1.00					0.86	
Flt Protected				0.95	1.00		0.95					1.00	
Satd. Flow (prot)				3614	6516		3855					1640	
Flt Permitted				0.95	1.00		0.95					1.00	
Satd. Flow (perm)				3614	6516		3855					1640	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	132	3242	13	174	0	0	0	0	4	
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	0	0	132	3254	0	174	0	0	0	0	4	
Turn Type				Prot	NA		Prot					Perm	
Protected Phases				2	1 2		4						
Permitted Phases												4	
Actuated Green, G (s)				10.3	38.3		27.7					27.7	
Effective Green, g (s)				10.3	38.3		27.7					27.7	
Actuated g/C Ratio				0.13	0.48		0.35					0.35	
Clearance Time (s)				8.7			5.3					5.3	
Lane Grp Cap (vph)				465	3119		1334					567	
v/s Ratio Prot				0.04	c0.50		c0.05						
v/s Ratio Perm												0.00	
v/c Ratio				0.28	1.04		0.13					0.01	
Uniform Delay, d1				31.5	20.9		17.9					17.1	
Progression Factor				1.00	1.00		0.02					1.00	
Incremental Delay, d2				1.5	28.9		0.2					0.0	
Delay (s)				33.0	49.8		0.5					17.2	
Level of Service				C	D		A					B	
Approach Delay (s)		0.0			49.1			0.5			17.2		
Approach LOS		A			D			A			B		
Intersection Summary													
HCM 2000 Control Delay			46.7		HCM 2000 Level of Service						D		
HCM 2000 Volume to Capacity ratio			0.84										
Actuated Cycle Length (s)			80.0		Sum of lost time (s)						27.9		
Intersection Capacity Utilization			91.8%		ICU Level of Service						F		
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1915: Site Driveway A/Crossover & 8 Mile Srv Rd (EB)

Project Panda
 2022 Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (vph)	137	2130	116	0	0	0	0	23	47	0	121	0		
Future Volume (vph)	137	2130	116	0	0	0	0	23	47	0	121	0		
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000		
Lane Width	14	12	12	12	12	12	12	12	12	12	12	12		
Total Lost time (s)	8.3	5.7						5.2	5.2		5.7			
Lane Util. Factor	0.97	0.81						1.00	1.00		0.95			
Frt	1.00	0.99						1.00	0.85		1.00			
Flt Protected	0.95	1.00						1.00	1.00		1.00			
Satd. Flow (prot)	3855	7880						1961	1667		3725			
Flt Permitted	0.95	1.00						1.00	1.00		1.00			
Satd. Flow (perm)	3855	7880						1961	1667		3725			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Adj. Flow (vph)	149	2315	126	0	0	0	0	25	51	0	132	0		
RTOR Reduction (vph)	0	13	0	0	0	0	0	0	48	0	0	0		
Lane Group Flow (vph)	149	2428	0	0	0	0	0	25	3	0	132	0		
Turn Type	Prot	NA						NA	Perm		NA			
Protected Phases	7	5 7						8		6	6			
Permitted Phases									8					
Actuated Green, G (s)	7.1	40.3						5.4	5.4		17.6			
Effective Green, g (s)	7.1	32.0						5.4	5.4		17.6			
Actuated g/C Ratio	0.09	0.40						0.07	0.07		0.22			
Clearance Time (s)	8.3							5.2	5.2		5.7			
Vehicle Extension (s)	3.0							3.0	3.0		3.0			
Lane Grp Cap (vph)	342	3155						132	112		820			
v/s Ratio Prot	0.04	c0.31						c0.01			c0.04			
v/s Ratio Perm									0.00					
v/c Ratio	0.44	0.77						0.19	0.03		0.16			
Uniform Delay, d1	34.5	20.8						35.2	34.8		25.2			
Progression Factor	1.00	1.00						1.00	1.00		0.09			
Incremental Delay, d2	0.9	1.2						0.7	0.1		0.1			
Delay (s)	35.4	21.9						35.9	34.9		2.4			
Level of Service	D	C						D	C		A			
Approach Delay (s)		22.7			0.0			35.2			2.4			
Approach LOS		C			A			D			A			
Intersection Summary														
HCM 2000 Control Delay			22.1									HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio			0.55											
Actuated Cycle Length (s)			79.9								27.9		Sum of lost time (s)	
Intersection Capacity Utilization			91.8%										ICU Level of Service	F
Analysis Period (min)			15											
c Critical Lane Group														

HCM Signalized Intersection Capacity Analysis
 1015: Crossover/Driveway & E 8 Mile Rd (WB)

Project Panda
 2022 Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	0	0	0	121	2983	12	160	0	0	0	0	4	
Future Volume (vph)	0	0	0	121	2983	12	160	0	0	0	0	4	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	12	12	12	12	11	12	14	14	14	11	11	11	
Total Lost time (s)				8.7	5.7		5.3					5.3	
Lane Util. Factor				0.97	0.86		0.97					1.00	
Fr _t				1.00	1.00		1.00					0.86	
Fl _t Protected				0.95	1.00		0.95					1.00	
Satd. Flow (prot)				3614	6516		3855					1640	
Fl _t Permitted				0.95	1.00		0.95					1.00	
Satd. Flow (perm)				3614	6516		3855					1640	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	132	3242	13	174	0	0	0	0	4	
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	0	0	132	3254	0	174	0	0	0	0	4	
Turn Type				Prot	NA		Prot					Perm	
Protected Phases				2	1 2		4						
Permitted Phases												4	
Actuated Green, G (s)				9.1	45.2		20.7					20.7	
Effective Green, g (s)				9.1	45.2		20.7					20.7	
Actuated g/C Ratio				0.11	0.57		0.26					0.26	
Clearance Time (s)				8.7			5.3					5.3	
Vehicle Extension (s)				3.0			3.0					3.0	
Lane Grp Cap (vph)				411	3686		998					424	
v/s Ratio Prot				0.04	c0.50		c0.05						
v/s Ratio Perm												0.00	
v/c Ratio				0.32	0.88		0.17					0.01	
Uniform Delay, d ₁				32.6	15.1		23.0					22.0	
Progression Factor				1.00	1.00		0.01					1.00	
Incremental Delay, d ₂				0.5	2.8		0.1					0.0	
Delay (s)				33.0	17.9		0.3					22.0	
Level of Service				C	B		A					C	
Approach Delay (s)		0.0			18.5			0.3			22.0		
Approach LOS		A			B			A			C		
Intersection Summary													
HCM 2000 Control Delay			17.6		HCM 2000 Level of Service						B		
HCM 2000 Volume to Capacity ratio			0.84										
Actuated Cycle Length (s)			79.9		Sum of lost time (s)					27.9			
Intersection Capacity Utilization			91.8%		ICU Level of Service					F			
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
 1704: NB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]

Project Panda
 2022 Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↑	↑↑				
Traffic Volume (vph)	0	0	0	0	209	380	312	451	0	0	0	0
Future Volume (vph)	0	0	0	0	209	380	312	451	0	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	12	12	14	12	12	12	12	12
Total Lost time (s)					5.7		5.5	5.5				
Lane Util. Factor					0.91		0.91	0.91				
Flt					0.90		1.00	1.00				
Flt Protected					1.00		0.95	0.99				
Satd. Flow (prot)					4835		1808	3546				
Flt Permitted					1.00		0.95	0.99				
Satd. Flow (perm)					4835		1808	3546				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	227	413	339	490	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	321	0	95	14	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	319	0	173	547	0	0	0	0
Turn Type					NA		Split	NA				
Protected Phases					6		5	5				
Permitted Phases												
Actuated Green, G (s)					17.3		51.5	51.5				
Effective Green, g (s)					17.3		51.5	51.5				
Actuated g/C Ratio					0.22		0.64	0.64				
Clearance Time (s)					5.7		5.5	5.5				
Lane Grp Cap (vph)					1045		1163	2282				
v/s Ratio Prot					c0.07		0.10	c0.15				
v/s Ratio Perm												
v/c Ratio					0.31		0.15	0.24				
Uniform Delay, d1					26.3		5.6	6.0				
Progression Factor					1.00		0.20	0.42				
Incremental Delay, d2					0.8		0.3	0.2				
Delay (s)					27.1		1.4	2.8				
Level of Service					C		A	A				
Approach Delay (s)		0.0			27.1			2.3			0.0	
Approach LOS		A			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			13.1		HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio			0.26									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)			11.2				
Intersection Capacity Utilization			50.6%		ICU Level of Service			A				
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1904: SB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2022 Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑								↘	↙↑	
Traffic Volume (vph)	0	371	261	0	0	0	0	0	0	360	265	0
Future Volume (vph)	0	371	261	0	0	0	0	0	0	360	265	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	11	11	11	12	12	12	12	12	12	16	14	14
Total Lost time (s)		5.8								5.5	5.5	
Lane Util. Factor		0.91								0.91	0.91	
Frt		0.94								1.00	1.00	
Flt Protected		1.00								0.95	0.98	
Satd. Flow (prot)		4854								1921	3738	
Flt Permitted		1.00								0.95	0.98	
Satd. Flow (perm)		4854								1921	3738	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	403	284	0	0	0	0	0	0	391	288	0
RTOR Reduction (vph)	0	160	0	0	0	0	0	0	0	38	38	0
Lane Group Flow (vph)	0	527	0	0	0	0	0	0	0	185	418	0
Turn Type		NA								Split	NA	
Protected Phases		12								11	11	
Permitted Phases												
Actuated Green, G (s)		18.2								50.5	50.5	
Effective Green, g (s)		18.2								50.5	50.5	
Actuated g/C Ratio		0.23								0.63	0.63	
Clearance Time (s)		5.8								5.5	5.5	
Lane Grp Cap (vph)		1104								1212	2359	
v/s Ratio Prot		c0.11								0.10	c0.11	
v/s Ratio Perm												
v/c Ratio		0.48								0.15	0.18	
Uniform Delay, d1		26.8								6.0	6.1	
Progression Factor		1.00								0.04	0.19	
Incremental Delay, d2		1.5								0.2	0.1	
Delay (s)		28.3								0.5	1.3	
Level of Service		C								A	A	
Approach Delay (s)		28.3			0.0			0.0			1.0	
Approach LOS		C			A			A			A	
Intersection Summary												
HCM 2000 Control Delay			14.7		HCM 2000 Level of Service						B	
HCM 2000 Volume to Capacity ratio			0.26									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)					11.3		
Intersection Capacity Utilization			33.0%		ICU Level of Service					A		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3945: NB M-1 [Woodward Ave] & Crossover/Site Driveway B

Project Panda
 2022 Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑	↗		↑↑↑↑				
Traffic Volume (vph)	0	0	0	0	32	39	0	999	75	0	0	0
Future Volume (vph)	0	0	0	0	32	39	0	999	75	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	16	16	16	12	12	12	12	12	12
Total Lost time (s)					9.0	9.0		5.7				
Lane Util. Factor					1.00	1.00		0.81				
Frt					1.00	0.85		0.99				
Flt Protected					1.00	1.00		1.00				
Satd. Flow (prot)					2222	1889		7858				
Flt Permitted					1.00	1.00		1.00				
Satd. Flow (perm)					2222	1889		7858				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	35	42	0	1086	82	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	31	0	15	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	35	11	0	1153	0	0	0	0
Turn Type					NA	Perm		NA				
Protected Phases					4			2				
Permitted Phases						4						
Actuated Green, G (s)					23.0	23.0		52.3				
Effective Green, g (s)					23.0	23.0		52.3				
Actuated g/C Ratio					0.26	0.26		0.58				
Clearance Time (s)					9.0	9.0		5.7				
Lane Grp Cap (vph)					567	482		4566				
v/s Ratio Prot					c0.02			c0.15				
v/s Ratio Perm						0.01						
v/c Ratio					0.06	0.02		0.25				
Uniform Delay, d1					25.3	25.1		9.3				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					0.2	0.1		0.1				
Delay (s)					25.5	25.2		9.4				
Level of Service					C	C		A				
Approach Delay (s)		0.0			25.3			9.4			0.0	
Approach LOS		A			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			10.4		HCM 2000 Level of Service				B			
HCM 2000 Volume to Capacity ratio			0.19									
Actuated Cycle Length (s)			90.0		Sum of lost time (s)				14.7			
Intersection Capacity Utilization			55.8%		ICU Level of Service				B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 3045: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2022 Build - AM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶					↑↑↑↑
Traffic Volume (vph)	32	0	0	0	0	3800
Future Volume (vph)	32	0	0	0	0	3800
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	16	12	12	12	12	12
Total Lost time (s)	6.0					5.7
Lane Util. Factor	1.00					0.81
Fr _t	1.00					1.00
Fl _t Protected	0.95					1.00
Satd. Flow (prot)	2111					7941
Fl _t Permitted	0.95					1.00
Satd. Flow (perm)	2111					7941
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	0	0	0	0	4130
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	35	0	0	0	0	4130
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Actuated Green, G (s)	26.0					52.3
Effective Green, g (s)	26.0					52.3
Actuated g/C Ratio	0.29					0.58
Clearance Time (s)	6.0					5.7
Lane Grp Cap (vph)	609					4614
v/s Ratio Prot	c0.02					c0.52
v/s Ratio Perm						
v/c Ratio	0.06					0.90
Uniform Delay, d ₁	23.1					16.5
Progression Factor	0.00					1.00
Incremental Delay, d ₂	0.2					3.1
Delay (s)	0.2					19.6
Level of Service	A					B
Approach Delay (s)	0.2		0.0		19.6	
Approach LOS	A		A		B	

Intersection Summary			
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.7
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2944: NB M-1 [Woodward Ave] & Crossover/W State Fair Ave

Project Panda
 2022 Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					←			↑↑↑↑					
Traffic Volume (vph)	0	0	0	0	96	157	0	918	87	0	0	0	
Future Volume (vph)	0	0	0	0	96	157	0	918	87	0	0	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	16	16	16	13	13	13	12	12	11	12	12	12	
Total Lost time (s)					8.8			5.2					
Lane Util. Factor					1.00			0.81					
Frbp, ped/bikes					0.99			1.00					
Flpb, ped/bikes					1.00			1.00					
Frt					0.92			0.99					
Flt Protected					1.00			1.00					
Satd. Flow (prot)					1827			7662					
Flt Permitted					1.00			1.00					
Satd. Flow (perm)					1827			7662					
Peak-hour factor, PHF	0.63	0.63	0.63	0.90	0.90	0.90	0.92	0.92	0.92	0.95	0.95	0.95	
Adj. Flow (vph)	0	0	0	0	107	174	0	998	95	0	0	0	
RTOR Reduction (vph)	0	0	0	0	49	0	0	14	0	0	0	0	
Lane Group Flow (vph)	0	0	0	0	232	0	0	1079	0	0	0	0	
Confl. Peds. (#/hr)	5					5			23	23			
Confl. Bikes (#/hr)									1				
Heavy Vehicles (%)	0%	0%	0%	0%	0%	4%	0%	4%	4%	0%	0%	0%	
Turn Type					NA			NA					
Protected Phases					4			2					
Permitted Phases													
Actuated Green, G (s)					28.2			77.8					
Effective Green, g (s)					28.2			77.8					
Actuated g/C Ratio					0.23			0.65					
Clearance Time (s)					8.8			5.2					
Lane Grp Cap (vph)					429			4967					
v/s Ratio Prot					c0.13			c0.14					
v/s Ratio Perm													
v/c Ratio					0.54			0.22					
Uniform Delay, d1					40.2			8.6					
Progression Factor					1.00			1.00					
Incremental Delay, d2					4.8			0.1					
Delay (s)					45.1			8.7					
Level of Service					D			A					
Approach Delay (s)		0.0			45.1			8.7			0.0		
Approach LOS		A			D			A			A		
Intersection Summary													
HCM 2000 Control Delay			16.2		HCM 2000 Level of Service				B				
HCM 2000 Volume to Capacity ratio			0.30										
Actuated Cycle Length (s)			120.0		Sum of lost time (s)				14.0				
Intersection Capacity Utilization			59.7%		ICU Level of Service				B				
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
 2044: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2022 Build - AM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↵					↑↑↑↑
Traffic Volume (vph)	96	0	0	0	0	3832
Future Volume (vph)	96	0	0	0	0	3832
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	16	16	12	12	10	12
Total Lost time (s)	5.8					5.2
Lane Util. Factor	1.00					0.81
Frbp, ped/bikes	1.00					1.00
Flpb, ped/bikes	1.00					1.00
Frt	1.00					1.00
Flt Protected	0.95					1.00
Satd. Flow (prot)	2153					8020
Flt Permitted	0.95					1.00
Satd. Flow (perm)	2153					8020
Peak-hour factor, PHF	0.90	0.90	0.92	0.92	0.63	0.95
Adj. Flow (vph)	107	0	0	0	0	4034
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	107	0	0	0	0	4034
Confl. Peds. (#/hr)	5	5		23	23	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Actuated Green, G (s)	31.2					77.8
Effective Green, g (s)	31.2					77.8
Actuated g/C Ratio	0.26					0.65
Clearance Time (s)	5.8					5.2
Lane Grp Cap (vph)	559					5199
v/s Ratio Prot	c0.05					c0.50
v/s Ratio Perm						
v/c Ratio	0.19					0.78
Uniform Delay, d1	34.6					14.9
Progression Factor	0.20					1.00
Incremental Delay, d2	0.6					1.2
Delay (s)	7.7					16.1
Level of Service	A					B
Approach Delay (s)	7.7		0.0		16.1	
Approach LOS	A		A		B	
Intersection Summary						
HCM 2000 Control Delay			15.9		HCM 2000 Level of Service B	
HCM 2000 Volume to Capacity ratio			0.63			
Actuated Cycle Length (s)			120.0		Sum of lost time (s) 14.0	
Intersection Capacity Utilization			59.7%		ICU Level of Service B	
Analysis Period (min)			15			
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis
 9006: Ralston St/Site Driveway C & W State Fair Ave

Project Panda
 2022 Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	19	69	0	0	233	19	13	0	10	9	1	7
Future Volume (Veh/h)	19	69	0	0	233	19	13	0	10	9	1	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	75	0	0	253	21	14	0	11	10	1	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		772										
pX, platoon unblocked												
vC, conflicting volume	274			75			389	391	75	392	380	264
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	274			75			389	391	75	392	380	264
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			97	100	99	98	100	99
cM capacity (veh/h)	1289			1524			556	536	986	554	543	775
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	96	274	25	19								
Volume Left	21	0	14	10								
Volume Right	0	21	11	8								
cSH	1289	1700	688	629								
Volume to Capacity	0.02	0.16	0.04	0.03								
Queue Length 95th (ft)	1	0	3	2								
Control Delay (s)	1.8	0.0	10.4	10.9								
Lane LOS	A		B	B								
Approach Delay (s)	1.8	0.0	10.4	10.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			29.1%		ICU Level of Service				A			
Analysis Period (min)			15									

Used pseudo SBT volume of 1 to prevent fatal error from occurring in SimTraffic.

HCM Unsignalized Intersection Capacity Analysis
 9007: W State Fair Ave & Site Driveway D

Project Panda
 2022 Build - AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Traffic Volume (veh/h)	19	68	244	57	22	8
Future Volume (Veh/h)	19	68	244	57	22	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	74	265	62	24	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)	9					
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	327			412	296	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	327			412	296	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	98			96	99	
cM capacity (veh/h)	1233			586	743	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	95	327	33			
Volume Left	21	0	24			
Volume Right	0	62	9			
cSH	1233	1700	806			
Volume to Capacity	0.02	0.19	0.04			
Queue Length 95th (ft)	1	0	3			
Control Delay (s)	1.9	0.0	11.0			
Lane LOS	A		B			
Approach Delay (s)	1.9	0.0	11.0			
Approach LOS			B			
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization			29.1%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis
1059: John R St & W State Fair Ave

Project Panda
2022 Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	62	11	28	188	23	32	80	21	13	110	11
Future Volume (vph)	9	62	11	28	188	23	32	80	21	13	110	11
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	10	11	11	10	12	12	10	12	12	10	12	12
Total Lost time (s)	5.9	5.9		5.9	5.9		5.3	5.3		5.3	5.3	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1366	1799		1773	1894		1624	1863		1627	1772	
Flt Permitted	0.59	1.00		0.70	1.00		0.67	1.00		0.68	1.00	
Satd. Flow (perm)	847	1799		1306	1894		1140	1863		1171	1772	
Peak-hour factor, PHF	0.83	0.83	0.83	0.76	0.76	0.76	0.89	0.89	0.89	0.86	0.86	0.86
Adj. Flow (vph)	11	75	13	37	247	30	36	90	24	15	128	13
RTOR Reduction (vph)	0	8	0	0	9	0	0	15	0	0	7	0
Lane Group Flow (vph)	11	80	0	37	268	0	36	99	0	15	134	0
Confl. Peds. (#/hr)	7					7	2					2
Heavy Vehicles (%)	29%	6%	0%	0%	4%	0%	9%	5%	0%	9%	10%	22%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	19.1	19.1		19.1	19.1		19.7	19.7		19.7	19.7	
Effective Green, g (s)	19.1	19.1		19.1	19.1		19.7	19.7		19.7	19.7	
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.39	0.39		0.39	0.39	
Clearance Time (s)	5.9	5.9		5.9	5.9		5.3	5.3		5.3	5.3	
Lane Grp Cap (vph)	323	687		498	723		449	734		461	698	
v/s Ratio Prot		0.04			c0.14			0.05			c0.08	
v/s Ratio Perm	0.01			0.03			0.03			0.01		
v/c Ratio	0.03	0.12		0.07	0.37		0.08	0.14		0.03	0.19	
Uniform Delay, d1	9.7	10.0		9.8	11.1		9.5	9.7		9.3	9.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.3		0.3	1.5		0.3	0.4		0.1	0.6	
Delay (s)	9.9	10.3		10.1	12.6		9.8	10.1		9.4	10.5	
Level of Service	A	B		B	B		A	B		A	B	
Approach Delay (s)		10.3			12.3			10.0			10.4	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			11.1				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.28									
Actuated Cycle Length (s)			50.0				Sum of lost time (s)		11.2			
Intersection Capacity Utilization			41.2%				ICU Level of Service		A			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

Project Panda

1404: SB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]/WB M-102 [8 Mile Srv Rd]



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↙	↕						↕	↘
Traffic Volume (vph)	0	0	0	197	324	0	0	0	0	0	424	241
Future Volume (vph)	0	0	0	197	324	0	0	0	0	0	424	241
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	14	12	14	9	12	12	12	12	12	11	13
Total Lost time (s)				5.6	5.6						5.7	
Lane Util. Factor				0.91	0.91						0.91	
Flt				1.00	1.00						0.95	
Flt Protected				0.95	1.00						1.00	
Satd. Flow (prot)				1808	3199						4893	
Flt Permitted				0.95	1.00						1.00	
Satd. Flow (perm)				1808	3199						4893	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	214	352	0	0	0	0	0	461	262
RTOR Reduction (vph)	0	0	0	27	14	0	0	0	0	0	128	0
Lane Group Flow (vph)	0	0	0	157	368	0	0	0	0	0	595	0
Turn Type				Split	NA						NA	
Protected Phases				10	10						9	
Permitted Phases												
Actuated Green, G (s)				50.4	50.4						18.3	
Effective Green, g (s)				50.4	50.4						18.3	
Actuated g/C Ratio				0.63	0.63						0.23	
Clearance Time (s)				5.6	5.6						5.7	
Lane Grp Cap (vph)				1139	2015						1119	
v/s Ratio Prot				0.09	c0.12						c0.12	
v/s Ratio Perm												
v/c Ratio				0.14	0.18						0.53	
Uniform Delay, d1				6.0	6.2						27.1	
Progression Factor				1.00	0.95						1.00	
Incremental Delay, d2				0.2	0.2						1.8	
Delay (s)				6.2	6.1						28.9	
Level of Service				A	A						C	
Approach Delay (s)		0.0			6.1			0.0			28.9	
Approach LOS		A			A			A			C	
Intersection Summary												
HCM 2000 Control Delay			18.9		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.28									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)				11.3			
Intersection Capacity Utilization			33.0%		ICU Level of Service				A			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1804: NB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2022 Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	345	386	0	0	0	0	0	418	180	0	0	0
Future Volume (vph)	345	386	0	0	0	0	0	418	180	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	14	9	9	12	12	12	11	11	11	12	12	12
Total Lost time (s)	5.4	5.4						5.7				
Lane Util. Factor	0.91	0.91						0.91				
Frt	1.00	1.00						0.95				
Flt Protected	0.95	0.99						1.00				
Satd. Flow (prot)	1808	3177						4940				
Flt Permitted	0.95	0.99						1.00				
Satd. Flow (perm)	1808	3177						4940				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	375	420	0	0	0	0	0	454	196	0	0	0
RTOR Reduction (vph)	28	28	0	0	0	0	0	98	0	0	0	0
Lane Group Flow (vph)	231	508	0	0	0	0	0	552	0	0	0	0
Turn Type	Split	NA						NA				
Protected Phases	2	2						1				
Permitted Phases												
Actuated Green, G (s)	50.6	50.6						18.3				
Effective Green, g (s)	50.6	50.6						18.3				
Actuated g/C Ratio	0.63	0.63						0.23				
Clearance Time (s)	5.4	5.4						5.7				
Lane Grp Cap (vph)	1143	2009						1130				
v/s Ratio Prot	0.13	c0.16						c0.11				
v/s Ratio Perm												
v/c Ratio	0.20	0.25						0.49				
Uniform Delay, d1	6.2	6.4						26.8				
Progression Factor	0.39	0.47						1.00				
Incremental Delay, d2	0.4	0.3						1.5				
Delay (s)	2.8	3.3						28.3				
Level of Service	A	A						C				
Approach Delay (s)		3.1			0.0			28.3			0.0	
Approach LOS		A			A			C			A	
Intersection Summary												
HCM 2000 Control Delay			14.4					HCM 2000 Level of Service			B	
HCM 2000 Volume to Capacity ratio			0.32									
Actuated Cycle Length (s)			80.0					Sum of lost time (s)		11.2		
Intersection Capacity Utilization			43.9%					ICU Level of Service		A		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2915: Market Place Dr/Crossover & EB M-102 [8 Mile Rd]

Project Panda
 2022 Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑↑↑	↗						↖↖	↘	↑		
Traffic Volume (vph)	0	2256	55	0	0	0	0	0	56	71	67	0	
Future Volume (vph)	0	2256	55	0	0	0	0	0	56	71	67	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	12	12	14	12	12	12	12	12	11	16	16	16	
Total Lost time (s)		6.2	6.2						6.0	6.0	6.0		
Lane Util. Factor		0.81	1.00						0.88	1.00	1.00		
Fr _t		1.00	0.85						0.85	1.00	1.00		
Fl _t Protected		1.00	1.00						1.00	0.95	1.00		
Satd. Flow (prot)		7941	1778						2836	2111	2222		
Fl _t Permitted		1.00	1.00						1.00	0.95	1.00		
Satd. Flow (perm)		7941	1778						2836	2111	2222		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	2452	60	0	0	0	0	0	61	77	73	0	
RTOR Reduction (vph)	0	0	16	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	2452	44	0	0	0	0	0	61	77	73	0	
Turn Type		NA	Prot						Prot	Split	NA		
Protected Phases		2 10	2 10						3	12	12		
Permitted Phases													
Actuated Green, G (s)		117.1	117.1						7.6	10.9	10.9		
Effective Green, g (s)		117.1	117.1						7.6	10.9	10.9		
Actuated g/C Ratio		0.73	0.73						0.05	0.07	0.07		
Clearance Time (s)									6.0	6.0	6.0		
Vehicle Extension (s)									3.0	3.0	3.0		
Lane Grp Cap (vph)		5811	1301						134	143	151		
v/s Ratio Prot		c0.31	0.02						c0.02	c0.04	0.03		
v/s Ratio Perm													
v/c Ratio		0.42	0.03						0.46	0.54	0.48		
Uniform Delay, d ₁		8.3	5.9						74.2	72.1	71.8		
Progression Factor		1.00	1.00						1.00	1.00	1.00		
Incremental Delay, d ₂		0.0	0.0						2.4	3.9	2.4		
Delay (s)		8.3	5.9						76.6	76.0	74.3		
Level of Service		A	A						E	E	E		
Approach Delay (s)		8.3			0.0			76.6			75.1		
Approach LOS		A			A			E			E		
Intersection Summary													
HCM 2000 Control Delay			13.5									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.43										
Actuated Cycle Length (s)			160.0									Sum of lost time (s)	24.4
Intersection Capacity Utilization			83.1%									ICU Level of Service	E
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
 4046: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2022 Build - AM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	3800
Future Volume (vph)	0	0	0	0	0	3800
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Satd. Flow (prot)	2222	0	0	0	0	7941
Flt Permitted						
Satd. Flow (perm)	2222	0	0	0	0	7941
Link Speed (mph)	25		40			40
Link Distance (ft)	111		488			826
Travel Time (s)	3.0		8.3			14.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	4130
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.9%
ICU Level of Service	A
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Delays on the major and minor streets should be 0 seconds as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
 4946: NB M-1 [Woodward Ave] & Crossover/State Fair Gate #5

Project Panda
 2022 Build - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↑↑↑↑				
Traffic Volume (vph)	0	0	0	0	0	0	0	1038	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	1038	0	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	12	12
Satd. Flow (prot)	0	0	0	0	2222	0	0	7941	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	2222	0	0	7941	0	0	0	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		111			711			473			267	
Travel Time (s)		3.0			19.4			8.1			4.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	1128	0	0	0	0
Sign Control		Free			Stop			Free			Free	




















Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.9%
ICU Level of Service	A
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Delays on the major and minor streets should be 0 seconds as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

HCM Signalized Intersection Capacity Analysis
 1915: Site Driveway A/Crossover & 8 Mile Srv Rd (EB)

Project Panda
 2022 Build - PM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	305	2581	63	0	0	0	0	57	115	0	65	0	
Future Volume (vph)	305	2581	63	0	0	0	0	57	115	0	65	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	14	12	12	12	12	12	12	12	12	12	12	12	
Total Lost time (s)	8.3	5.7						5.2	5.2		5.7		
Lane Util. Factor	0.97	0.81						1.00	1.00		0.95		
Frt	1.00	1.00						1.00	0.85		1.00		
Flt Protected	0.95	1.00						1.00	1.00		1.00		
Satd. Flow (prot)	3855	7913						1961	1667		3725		
Flt Permitted	0.95	1.00						1.00	1.00		1.00		
Satd. Flow (perm)	3855	7913						1961	1667		3725		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	332	2805	68	0	0	0	0	62	125	0	71	0	
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	117	0	0	0	
Lane Group Flow (vph)	332	2868	0	0	0	0	0	62	8	0	71	0	
Turn Type	Prot	NA						NA	Perm		NA		
Protected Phases	7	5 7						8		6	6		
Permitted Phases									8				
Actuated Green, G (s)	10.7	44.4						5.4	5.4		13.5		
Effective Green, g (s)	10.7	36.1						5.4	5.4		13.5		
Actuated g/C Ratio	0.13	0.45						0.07	0.07		0.17		
Clearance Time (s)	8.3							5.2	5.2		5.7		
Vehicle Extension (s)	3.0							3.0	3.0		3.0		
Lane Grp Cap (vph)	516	3575						132	112		629		
v/s Ratio Prot	0.09	c0.36						c0.03			c0.02		
v/s Ratio Perm									0.01				
v/c Ratio	0.64	0.80						0.47	0.08		0.11		
Uniform Delay, d1	32.8	18.8						35.9	34.9		28.1		
Progression Factor	1.00	1.00						1.00	1.00		0.00		
Incremental Delay, d2	2.7	1.4						2.6	0.3		0.1		
Delay (s)	35.5	20.2						38.5	35.2		0.1		
Level of Service	D	C						D	D		A		
Approach Delay (s)		21.8			0.0			36.3			0.1		
Approach LOS		C			A			D			A		
Intersection Summary													
HCM 2000 Control Delay			22.1									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.63										
Actuated Cycle Length (s)			79.9									Sum of lost time (s)	27.9
Intersection Capacity Utilization			93.0%									ICU Level of Service	F
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
 1015: Crossover/Driveway & E 8 Mile Rd (WB)

Project Panda
 2022 Build - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔↔	↑↑↑		↔↔					↔
Traffic Volume (vph)	0	0	0	65	2699	4	362	0	0	0	0	11
Future Volume (vph)	0	0	0	65	2699	4	362	0	0	0	0	11
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	11	12	14	14	14	11	11	11
Total Lost time (s)				8.7	5.7		5.3					5.3
Lane Util. Factor				0.97	0.86		0.97					1.00
Flt				1.00	1.00		1.00					0.86
Flt Protected				0.95	1.00		0.95					1.00
Satd. Flow (prot)				3614	6519		3855					1640
Flt Permitted				0.95	1.00		0.95					1.00
Satd. Flow (perm)				3614	6519		3855					1640
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	71	2934	4	393	0	0	0	0	12
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	71	2938	0	393	0	0	0	0	12
Turn Type				Prot	NA		Prot					Perm
Protected Phases				2	1 2		4					
Permitted Phases												4
Actuated Green, G (s)				10.3	38.3		27.7					27.7
Effective Green, g (s)				10.3	38.3		27.7					27.7
Actuated g/C Ratio				0.13	0.48		0.35					0.35
Clearance Time (s)				8.7			5.3					5.3
Lane Grp Cap (vph)				465	3120		1334					567
v/s Ratio Prot				0.02	c0.45		c0.10					
v/s Ratio Perm												0.01
v/c Ratio				0.15	0.94		0.29					0.02
Uniform Delay, d1				31.0	19.8		19.0					17.2
Progression Factor				1.00	1.00		0.02					1.00
Incremental Delay, d2				0.7	7.3		0.5					0.1
Delay (s)				31.7	27.1		0.9					17.3
Level of Service				C	C		A					B
Approach Delay (s)		0.0			27.2			0.9			17.3	
Approach LOS		A			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	27.9
Intersection Capacity Utilization	93.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1904: SB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2022 Build - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑↑								↘	↙↑		
Traffic Volume (vph)	0	454	175	0	0	0	0	0	0	435	257	0	
Future Volume (vph)	0	454	175	0	0	0	0	0	0	435	257	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	11	11	11	12	12	12	12	12	12	16	14	14	
Total Lost time (s)		5.8								5.5	5.5		
Lane Util. Factor		0.91								0.91	0.91		
Frt		0.96								1.00	1.00		
Flt Protected		1.00								0.95	0.98		
Satd. Flow (prot)		4959								1921	3723		
Flt Permitted		1.00								0.95	0.98		
Satd. Flow (perm)		4959								1921	3723		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	493	190	0	0	0	0	0	0	473	279	0	
RTOR Reduction (vph)	0	87	0	0	0	0	0	0	0	22	22	0	
Lane Group Flow (vph)	0	596	0	0	0	0	0	0	0	224	484	0	
Turn Type		NA								Split	NA		
Protected Phases		12								11	11		
Permitted Phases													
Actuated Green, G (s)		18.2								50.5	50.5		
Effective Green, g (s)		18.2								50.5	50.5		
Actuated g/C Ratio		0.23								0.63	0.63		
Clearance Time (s)		5.8								5.5	5.5		
Lane Grp Cap (vph)		1128								1212	2350		
v/s Ratio Prot		c0.12								0.12	c0.13		
v/s Ratio Perm													
v/c Ratio		0.53								0.18	0.21		
Uniform Delay, d1		27.1								6.2	6.3		
Progression Factor		1.00								0.09	0.20		
Incremental Delay, d2		1.8								0.3	0.2		
Delay (s)		28.9								0.8	1.4		
Level of Service		C								A	A		
Approach Delay (s)		28.9			0.0			0.0			1.2		
Approach LOS		C			A			A			A		
Intersection Summary													
HCM 2000 Control Delay			14.4									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.29										
Actuated Cycle Length (s)			80.0									Sum of lost time (s)	11.3
Intersection Capacity Utilization			35.8%									ICU Level of Service	A
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3945: NB M-1 [Woodward Ave] & Crossover/Site Driveway B

Project Panda
 2022 Build - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑	↗		↑↑↑↑				
Traffic Volume (vph)	0	0	0	0	57	72	0	3649	57	0	0	0
Future Volume (vph)	0	0	0	0	57	72	0	3649	57	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	16	16	16	12	12	12	12	12	12
Total Lost time (s)					9.0	9.0		5.7				
Lane Util. Factor					1.00	1.00		0.81				
Fr _t					1.00	0.85		1.00				
Fl _t Protected					1.00	1.00		1.00				
Satd. Flow (prot)					2222	1889		7923				
Fl _t Permitted					1.00	1.00		1.00				
Satd. Flow (perm)					2222	1889		7923				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	62	78	0	3966	62	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	22	0	2	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	62	56	0	4026	0	0	0	0
Turn Type					NA	Perm		NA				
Protected Phases					4			2				
Permitted Phases						4						
Actuated Green, G (s)					23.0	23.0		62.3				
Effective Green, g (s)					23.0	23.0		62.3				
Actuated g/C Ratio					0.23	0.23		0.62				
Clearance Time (s)					9.0	9.0		5.7				
Lane Grp Cap (vph)					511	434		4936				
v/s Ratio Prot					0.03			c0.51				
v/s Ratio Perm						c0.03						
v/c Ratio					0.12	0.13		0.82				
Uniform Delay, d ₁					30.5	30.5		14.4				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d ₂					0.5	0.6		1.6				
Delay (s)					31.0	31.2		16.0				
Level of Service					C	C		B				
Approach Delay (s)		0.0			31.1			16.0			0.0	
Approach LOS		A			C			B			A	

Intersection Summary

HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.7
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3045: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2022 Build - PM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶					↑↑↑↑
Traffic Volume (vph)	57	0	0	0	0	1543
Future Volume (vph)	57	0	0	0	0	1543
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	16	12	12	12	12	12
Total Lost time (s)	6.0					5.7
Lane Util. Factor	1.00					0.81
Frt	1.00					1.00
Flt Protected	0.95					1.00
Satd. Flow (prot)	2111					7941
Flt Permitted	0.95					1.00
Satd. Flow (perm)	2111					7941
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	62	0	0	0	0	1677
RTOR Reduction (vph)	21	0	0	0	0	0
Lane Group Flow (vph)	41	0	0	0	0	1677
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Actuated Green, G (s)	26.0					62.3
Effective Green, g (s)	26.0					62.3
Actuated g/C Ratio	0.26					0.62
Clearance Time (s)	6.0					5.7
Lane Grp Cap (vph)	548					4947
v/s Ratio Prot	c0.02					c0.21
v/s Ratio Perm						
v/c Ratio	0.07					0.34
Uniform Delay, d1	27.9					9.0
Progression Factor	0.00					1.00
Incremental Delay, d2	0.3					0.2
Delay (s)	0.4					9.2
Level of Service	A					A
Approach Delay (s)	0.4		0.0		9.2	
Approach LOS	A		A		A	

Intersection Summary			
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.7
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2944: NB M-1 [Woodward Ave] & Crossover/W State Fair Ave

Project Panda
 2022 Build - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					1			11111				
Traffic Volume (vph)	0	0	0	0	116	165	0	3541	102	0	0	0
Future Volume (vph)	0	0	0	0	116	165	0	3541	102	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	16	16	16	13	13	13	12	12	11	12	12	12
Total Lost time (s)					8.8			5.2				
Lane Util. Factor					1.00			0.81				
Frbp, ped/bikes					0.99			1.00				
Flpb, ped/bikes					1.00			1.00				
Frt					0.92			1.00				
Flt Protected					1.00			1.00				
Satd. Flow (prot)					1822			7980				
Flt Permitted					1.00			1.00				
Satd. Flow (perm)					1822			7980				
Peak-hour factor, PHF	0.50	0.50	0.50	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	0	125	177	0	3727	107	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	302	0	0	3830	0	0	0	0
Confl. Peds. (#/hr)	5					5			23	23		
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	1%	1%	5%	0%	1%	0%	0%	0%	0%
Turn Type					NA			NA				
Protected Phases					4			2				
Permitted Phases												
Actuated Green, G (s)					28.2			77.8				
Effective Green, g (s)					28.2			77.8				
Actuated g/C Ratio					0.23			0.65				
Clearance Time (s)					8.8			5.2				
Lane Grp Cap (vph)					428			5173				
v/s Ratio Prot					c0.17			c0.48				
v/s Ratio Perm												
v/c Ratio					0.71			0.74				
Uniform Delay, d1					42.1			14.3				
Progression Factor					1.00			1.00				
Incremental Delay, d2					9.4			1.0				
Delay (s)					51.5			15.3				
Level of Service					D			B				
Approach Delay (s)		0.0			51.5			15.3			0.0	
Approach LOS		A			D			B			A	
Intersection Summary												
HCM 2000 Control Delay			17.9					HCM 2000 Level of Service		B		
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			120.0					Sum of lost time (s)		14.0		
Intersection Capacity Utilization			67.7%					ICU Level of Service		C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 2044: SB M-1 [Woodward Ave] & Crossover

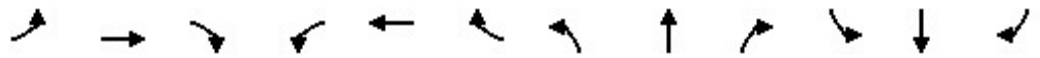
Project Panda
 2022 Build - PM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↵					↑↑↑↑
Traffic Volume (vph)	116	0	0	0	0	1601
Future Volume (vph)	116	0	0	0	0	1601
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	16	16	12	12	10	12
Total Lost time (s)	5.8					5.2
Lane Util. Factor	1.00					0.81
Frpb, ped/bikes	1.00					1.00
Flpb, ped/bikes	1.00					1.00
Fr _t	1.00					1.00
Fl _t Protected	0.95					1.00
Satd. Flow (prot)	2132					7941
Fl _t Permitted	0.95					1.00
Satd. Flow (perm)	2132					7941
Peak-hour factor, PHF	0.95	0.95	0.92	0.92	0.50	0.95
Adj. Flow (vph)	122	0	0	0	0	1685
RTOR Reduction (vph)	21	0	0	0	0	0
Lane Group Flow (vph)	101	0	0	0	0	1685
Confl. Peds. (#/hr)	5	5		23	23	
Heavy Vehicles (%)	1%	0%	0%	0%	0%	2%
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Actuated Green, G (s)	31.2					77.8
Effective Green, g (s)	31.2					77.8
Actuated g/C Ratio	0.26					0.65
Clearance Time (s)	5.8					5.2
Lane Grp Cap (vph)	554					5148
v/s Ratio Prot	c0.05					c0.21
v/s Ratio Perm						
v/c Ratio	0.18					0.33
Uniform Delay, d ₁	34.5					9.4
Progression Factor	0.00					1.00
Incremental Delay, d ₂	0.5					0.2
Delay (s)	0.5					9.6
Level of Service	A					A
Approach Delay (s)	0.5		0.0		9.6	
Approach LOS	A		A		A	
Intersection Summary						
HCM 2000 Control Delay			9.0		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.29			
Actuated Cycle Length (s)			120.0		Sum of lost time (s)	14.0
Intersection Capacity Utilization			67.7%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis
 9006: Ralston St/Site Driveway C & W State Fair Ave

Project Panda
 2022 Build - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	10	92	0	0	245	10	18	0	11	19	1	18
Future Volume (Veh/h)	10	92	0	0	245	10	18	0	11	19	1	18
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	100	0	0	266	11	20	0	12	21	1	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		772										
pX, platoon unblocked												
vC, conflicting volume	277			100			414	399	100	406	394	272
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	277			100			414	399	100	406	394	272
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			96	100	99	96	100	97
cM capacity (veh/h)	1286			1493			530	534	956	545	538	767
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	111	277	32	42								
Volume Left	11	0	20	21								
Volume Right	0	11	12	20								
cSH	1286	1700	636	632								
Volume to Capacity	0.01	0.16	0.05	0.07								
Queue Length 95th (ft)	1	0	4	5								
Control Delay (s)	0.8	0.0	11.0	11.1								
Lane LOS	A		B	B								
Approach Delay (s)	0.8	0.0	11.0	11.1								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.0									
Intersection Capacity Utilization			22.8%		ICU Level of Service				A			
Analysis Period (min)			15									

Used pseudo SBT volume of 1 to prevent fatal error from occurring in SimTraffic.

HCM Unsignalized Intersection Capacity Analysis
 9007: W State Fair Ave & Site Driveway D

Project Panda
 2022 Build - PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Traffic Volume (veh/h)	10	111	237	31	55	18
Future Volume (Veh/h)	10	111	237	31	55	18
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	121	258	34	60	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						9
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	292			418	275	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	292			418	275	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	99			90	97	
cM capacity (veh/h)	1270			586	764	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	132	292	80			
Volume Left	11	0	60			
Volume Right	0	34	20			
cSH	1270	1700	782			
Volume to Capacity	0.01	0.17	0.10			
Queue Length 95th (ft)	1	0	9			
Control Delay (s)	0.7	0.0	11.3			
Lane LOS	A		B			
Approach Delay (s)	0.7	0.0	11.3			
Approach LOS			B			
Intersection Summary						
Average Delay			2.0			
Intersection Capacity Utilization			23.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis
1059: John R St & W State Fair Ave

Project Panda
2022 Build - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	148	29	71	284	56	58	221	64	52	155	25
Future Volume (vph)	15	148	29	71	284	56	58	221	64	52	155	25
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	10	11	11	10	12	12	10	12	12	10	12	12
Total Lost time (s)	5.9	5.9		5.9	5.9		5.3	5.3		5.3	5.3	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.97		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1542	1870		1773	1912		1612	1894		1772	1900	
Flt Permitted	0.46	1.00		0.63	1.00		0.63	1.00		0.53	1.00	
Satd. Flow (perm)	749	1870		1184	1912		1062	1894		981	1900	
Peak-hour factor, PHF	0.90	0.90	0.90	0.88	0.88	0.88	0.88	0.88	0.88	0.85	0.85	0.85
Adj. Flow (vph)	17	164	32	81	323	64	66	251	73	61	182	29
RTOR Reduction (vph)	0	14	0	0	14	0	0	21	0	0	12	0
Lane Group Flow (vph)	17	182	0	81	373	0	66	303	0	61	199	0
Confl. Peds. (#/hr)									1	1		
Heavy Vehicles (%)	15%	1%	0%	0%	2%	2%	10%	2%	0%	0%	2%	10%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	19.1	19.1		19.1	19.1		19.7	19.7		19.7	19.7	
Effective Green, g (s)	19.1	19.1		19.1	19.1		19.7	19.7		19.7	19.7	
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.39	0.39		0.39	0.39	
Clearance Time (s)	5.9	5.9		5.9	5.9		5.3	5.3		5.3	5.3	
Lane Grp Cap (vph)	286	714		452	730		418	746		386	748	
v/s Ratio Prot		0.10			c0.19			c0.16			0.10	
v/s Ratio Perm	0.02			0.07			0.06			0.06		
v/c Ratio	0.06	0.25		0.18	0.51		0.16	0.41		0.16	0.27	
Uniform Delay, d1	9.8	10.6		10.2	11.9		9.8	10.9		9.8	10.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.9		0.9	2.5		0.8	1.6		0.9	0.9	
Delay (s)	10.2	11.4		11.1	14.4		10.6	12.6		10.7	11.1	
Level of Service	B	B		B	B		B	B		B	B	
Approach Delay (s)		11.3			13.8			12.2			11.0	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			12.4				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			50.0			Sum of lost time (s)				11.2		
Intersection Capacity Utilization			65.0%			ICU Level of Service				C		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

Project Panda

1404: SB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]/WB M-102 [8 Mile Srv Rd]



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↙	↕						↕	↘
Traffic Volume (vph)	0	0	0	196	438	0	0	0	0	0	495	284
Future Volume (vph)	0	0	0	196	438	0	0	0	0	0	495	284
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	14	12	14	9	12	12	12	12	12	11	13
Total Lost time (s)				5.6	5.6						5.7	
Lane Util. Factor				0.91	0.91						0.91	
Flt				1.00	1.00						0.95	
Flt Protected				0.95	1.00						1.00	
Satd. Flow (prot)				1808	3205						4891	
Flt Permitted				0.95	1.00						1.00	
Satd. Flow (perm)				1808	3205						4891	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	213	476	0	0	0	0	0	538	309
RTOR Reduction (vph)	0	0	0	17	14	0	0	0	0	0	130	0
Lane Group Flow (vph)	0	0	0	175	483	0	0	0	0	0	717	0
Turn Type				Split	NA							NA
Protected Phases				10	10							9
Permitted Phases												
Actuated Green, G (s)				50.4	50.4							18.3
Effective Green, g (s)				50.4	50.4							18.3
Actuated g/C Ratio				0.63	0.63							0.23
Clearance Time (s)				5.6	5.6							5.7
Lane Grp Cap (vph)				1139	2019							1118
v/s Ratio Prot				0.10	c0.15							c0.15
v/s Ratio Perm												
v/c Ratio				0.15	0.24							0.64
Uniform Delay, d1				6.1	6.4							27.9
Progression Factor				0.73	0.74							1.00
Incremental Delay, d2				0.3	0.3							2.8
Delay (s)				4.7	5.0							30.7
Level of Service				A	A							C
Approach Delay (s)		0.0			4.9			0.0				30.7
Approach LOS		A			A			A				C
Intersection Summary												
HCM 2000 Control Delay			19.2		HCM 2000 Level of Service						B	
HCM 2000 Volume to Capacity ratio			0.35									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)					11.3		
Intersection Capacity Utilization			35.8%		ICU Level of Service					A		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1804: NB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2022 Build - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↖↗						↖↗↘				
Traffic Volume (vph)	390	499	0	0	0	0	0	667	155	0	0	0
Future Volume (vph)	390	499	0	0	0	0	0	667	155	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	14	9	9	12	12	12	11	11	11	12	12	12
Total Lost time (s)	5.4	5.4						5.7				
Lane Util. Factor	0.91	0.91						0.91				
Frt	1.00	1.00						0.97				
Flt Protected	0.95	0.99						1.00				
Satd. Flow (prot)	1808	3185						5028				
Flt Permitted	0.95	0.99						1.00				
Satd. Flow (perm)	1808	3185						5028				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	424	542	0	0	0	0	0	725	168	0	0	0
RTOR Reduction (vph)	14	14	0	0	0	0	0	48	0	0	0	0
Lane Group Flow (vph)	300	638	0	0	0	0	0	845	0	0	0	0
Turn Type	Split	NA						NA				
Protected Phases	2	2						1				
Permitted Phases												
Actuated Green, G (s)	50.6	50.6						18.3				
Effective Green, g (s)	50.6	50.6						18.3				
Actuated g/C Ratio	0.63	0.63						0.23				
Clearance Time (s)	5.4	5.4						5.7				
Lane Grp Cap (vph)	1143	2014						1150				
v/s Ratio Prot	0.17	c0.20						c0.17				
v/s Ratio Perm												
v/c Ratio	0.26	0.32						0.73				
Uniform Delay, d1	6.5	6.8						28.6				
Progression Factor	0.46	0.47						1.00				
Incremental Delay, d2	0.5	0.4						4.2				
Delay (s)	3.5	3.6						32.8				
Level of Service	A	A						C				
Approach Delay (s)		3.6			0.0			32.8			0.0	
Approach LOS		A			A			C			A	

Intersection Summary

HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	11.2
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2915: Market Place Dr/Crossover & EB M-102 [8 Mile Rd]

Project Panda
 2022 Build - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑↑↑	↗						↖↖	↘	↑		
Traffic Volume (vph)	0	2674	119	0	0	0	0	0	210	65	115	0	
Future Volume (vph)	0	2674	119	0	0	0	0	0	210	65	115	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	12	12	14	12	12	12	12	12	11	16	16	16	
Total Lost time (s)		6.2	6.2						6.0	6.0	6.0		
Lane Util. Factor		0.81	1.00						0.88	1.00	1.00		
Fr _t		1.00	0.85						0.85	1.00	1.00		
Fl _t Protected		1.00	1.00						1.00	0.95	1.00		
Satd. Flow (prot)		7941	1778						2836	2111	2222		
Fl _t Permitted		1.00	1.00						1.00	0.95	1.00		
Satd. Flow (perm)		7941	1778						2836	2111	2222		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	2907	129	0	0	0	0	0	228	71	125	0	
RTOR Reduction (vph)	0	0	41	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	2907	88	0	0	0	0	0	228	71	125	0	
Turn Type		NA	Prot						Prot	Split	NA		
Protected Phases		2 10	2 10						3	12	12		
Permitted Phases													
Actuated Green, G (s)		108.8	108.8						14.0	12.8	12.8		
Effective Green, g (s)		108.8	108.8						14.0	12.8	12.8		
Actuated g/C Ratio		0.68	0.68						0.09	0.08	0.08		
Clearance Time (s)									6.0	6.0	6.0		
Vehicle Extension (s)									3.0	3.0	3.0		
Lane Grp Cap (vph)		5399	1209						248	168	177		
v/s Ratio Prot		c0.37	0.05						c0.08	0.03	c0.06		
v/s Ratio Perm													
v/c Ratio		0.54	0.07						0.92	0.42	0.71		
Uniform Delay, d ₁		12.9	8.6						72.4	70.1	71.8		
Progression Factor		0.97	1.17						1.00	1.00	1.00		
Incremental Delay, d ₂		0.1	0.0						35.7	1.7	12.1		
Delay (s)		12.7	10.1						108.1	71.8	83.9		
Level of Service		B	B						F	E	F		
Approach Delay (s)		12.6			0.0			108.1				79.5	
Approach LOS		B			A			F				E	
Intersection Summary													
HCM 2000 Control Delay			22.7									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.59										
Actuated Cycle Length (s)			160.0									Sum of lost time (s)	24.4
Intersection Capacity Utilization			87.2%									ICU Level of Service	E
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
 4046: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2022 Build - PM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	1543
Future Volume (vph)	0	0	0	0	0	1543
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Satd. Flow (prot)	2222	0	0	0	0	7941
Flt Permitted						
Satd. Flow (perm)	2222	0	0	0	0	7941
Link Speed (mph)	25		40			40
Link Distance (ft)	133		581			733
Travel Time (s)	3.6		9.9			12.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	1677
Sign Control	Stop		Free			Free

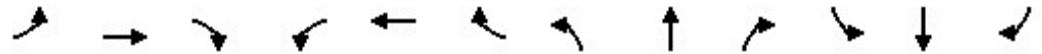
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.0%
ICU Level of Service	A
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Delays on the major and minor streets should be 0 seconds as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
 4946: NB M-1 [Woodward Ave] & Crossover/State Fair Gate #5

Project Panda
 2022 Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↑↑↑↑↔				
Traffic Volume (vph)	0	0	0	0	0	0	0	3721	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	3721	0	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	12	12
Satd. Flow (prot)	0	0	0	0	2222	0	0	7941	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	2222	0	0	7941	0	0	0	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		133			741			525			217	
Travel Time (s)		3.6			20.2			8.9			3.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	4045	0	0	0	0
Sign Control		Free			Stop			Free			Free	






















Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.0%
ICU Level of Service	A
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Delays on the major and minor streets should be 0 seconds as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
 1915: Site Driveway A/Crossover & 8 Mile Srv Rd (EB)

Project Panda
 2022 Build - AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  									 	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	14	12	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	325		275	0		0	0		0	0		0
Storage Lanes	2		0	0		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			No
Link Speed (mph)		40			40			25				25
Link Distance (ft)		679			2304			386				96
Travel Time (s)		11.6			39.3			10.5				2.6
Lane Group Flow (vph)	149	2441	0	0	0	0	0	25	51	0	132	0
v/c Ratio	0.29	0.60						0.12	0.12		0.21	
Control Delay	33.1	10.3						33.6	0.6		0.8	
Queue Delay	0.0	0.0						0.0	0.0		0.0	
Total Delay	33.1	10.3						33.6	0.6		0.8	
Queue Length 50th (ft)	25	212						11	0		0	
Queue Length 95th (ft)	51	91						34	0		0	
Internal Link Dist (ft)		599			2224			306			16	
Turn Bay Length (ft)	325											
Base Capacity (vph)	515	4079						215	422		619	
Starvation Cap Reductn	0	0						0	0		0	
Spillback Cap Reductn	0	0						0	0		0	
Storage Cap Reductn	0	0						0	0		0	
Reduced v/c Ratio	0.29	0.60						0.12	0.12		0.21	
Intersection Summary												
Area Type:	Other											

Lanes, Volumes, Timings
 1015: Crossover/Driveway & E 8 Mile Rd (WB)

Project Panda
 2022 Build - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	11	12	14	14	14	11	11	11
Storage Length (ft)	0		0	150		0	0		0	0		0
Storage Lanes	0		0	2		0	2		0	0		1
Taper Length (ft)	25			100			25			25		
Right Turn on Red			Yes			Yes			Yes			No
Link Speed (mph)		40			40			25				25
Link Distance (ft)		682			2329			96				286
Travel Time (s)		11.6			39.7			2.6				7.8
Lane Group Flow (vph)	0	0	0	132	3255	0	174	0	0	0	0	4
v/c Ratio				0.28	0.97		0.13					0.01
Control Delay				33.3	29.2		0.5					17.2
Queue Delay				0.0	0.0		0.0					0.0
Total Delay				33.3	29.2		0.5					17.2
Queue Length 50th (ft)				31	429		0					1
Queue Length 95th (ft)				56	#558		0					8
Internal Link Dist (ft)		602			2249			16				206
Turn Bay Length (ft)				150								
Base Capacity (vph)				465	3363		1334					567
Starvation Cap Reductn				0	0		0					0
Spillback Cap Reductn				0	0		0					0
Storage Cap Reductn				0	0		0					0
Reduced v/c Ratio				0.28	0.97		0.13					0.01

Intersection Summary

Area Type: Other
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
 1704: NB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]

Project Panda
 2022 Build - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↑	↑↑				
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	12	12	14	12	12	12	12	12
Storage Length (ft)	0		0	875		0	90		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		174			1335			234				818
Travel Time (s)		3.0			22.8			4.0				13.9
Lane Group Flow (vph)	0	0	0	0	640	0	268	561	0	0	0	0
v/c Ratio					0.47		0.21	0.24				
Control Delay					10.7		0.5	2.6				
Queue Delay					0.0		0.5	0.4				
Total Delay					10.7		1.0	3.0				
Queue Length 50th (ft)					35		1	30				
Queue Length 95th (ft)					65		4	32				
Internal Link Dist (ft)		94			1255			154				738
Turn Bay Length (ft)							90					
Base Capacity (vph)					1365		1259	2296				
Starvation Cap Reductn					0		621	1193				
Spillback Cap Reductn					0		0	0				
Storage Cap Reductn					0		0	0				
Reduced v/c Ratio					0.47		0.42	0.51				
Intersection Summary												
Area Type:	Other											

Lanes, Volumes, Timings
 1904: SB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2022 Build - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑								↘	↙↑	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	11	11	11	12	12	12	12	12	12	16	14	14
Storage Length (ft)	0		900	0		0	0		0	90		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		1309			166			808				245
Travel Time (s)		22.3			2.8			13.8				4.2
Lane Group Flow (vph)	0	687	0	0	0	0	0	0	0	223	456	0
v/c Ratio		0.54								0.18	0.19	
Control Delay		20.5								0.4	1.1	
Queue Delay		0.0								0.6	0.4	
Total Delay		20.5								1.0	1.4	
Queue Length 50th (ft)		75								1	7	
Queue Length 95th (ft)		112								1	9	
Internal Link Dist (ft)		1229			86			728				165
Turn Bay Length (ft)										90		
Base Capacity (vph)		1264								1250	2397	
Starvation Cap Reductn		0								715	1376	
Spillback Cap Reductn		0								0	0	
Storage Cap Reductn		0								0	0	
Reduced v/c Ratio		0.54								0.42	0.45	

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 3945: NB M-1 [Woodward Ave] & Crossover/Site Driveway B

Project Panda
 2022 Build - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑	↗		↑↑↑↑				
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	16	16	16	12	12	12	12	12	12
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		30			25			40				40
Link Distance (ft)		98			1019			383				473
Travel Time (s)		2.2			27.8			6.5				8.1
Lane Group Flow (vph)	0	0	0	0	35	42	0	1168	0	0	0	0
v/c Ratio					0.06	0.08		0.26				
Control Delay					25.8	9.0		9.1				
Queue Delay					0.0	0.0		0.0				
Total Delay					25.8	9.0		9.1				
Queue Length 50th (ft)					15	0		71				
Queue Length 95th (ft)					38	24		87				
Internal Link Dist (ft)		18			939			303				393
Turn Bay Length (ft)												
Base Capacity (vph)					567	514		4579				
Starvation Cap Reductn					0	0		0				
Spillback Cap Reductn					0	0		0				
Storage Cap Reductn					0	0		0				
Reduced v/c Ratio					0.06	0.08		0.26				

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 3045: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2022 Build - AM Peak Hour



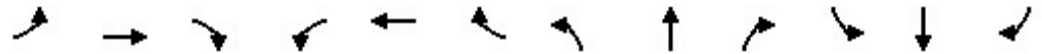
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Right Turn on Red	Yes	Yes		Yes		
Link Speed (mph)	25		40			40
Link Distance (ft)	98		813			488
Travel Time (s)	2.7		13.9			8.3
Lane Group Flow (vph)	35	0	0	0	0	4130
v/c Ratio	0.06					0.90
Control Delay	0.2					19.9
Queue Delay	0.0					0.0
Total Delay	0.2					19.9
Queue Length 50th (ft)	0					468
Queue Length 95th (ft)	0					515
Internal Link Dist (ft)	18		733			408
Turn Bay Length (ft)						
Base Capacity (vph)	609					4614
Starvation Cap Reductn	0					0
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.06					0.90

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 2944: NB M-1 [Woodward Ave] & Crossover/W State Fair Ave

Project Panda
 2022 Build - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	16	16	13	13	13	12	12	11	12	12	12
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		25			25			40				40
Link Distance (ft)		76			457			1032				459
Travel Time (s)		2.1			12.5			17.6				7.8
Lane Group Flow (vph)	0	0	0	0	281	0	0	1093	0	0	0	0
v/c Ratio					0.59			0.22				
Control Delay					36.8			8.4				
Queue Delay					0.0			0.0				
Total Delay					36.8			8.4				
Queue Length 50th (ft)					150			75				
Queue Length 95th (ft)					243			89				
Internal Link Dist (ft)		1			377			952				379
Turn Bay Length (ft)												
Base Capacity (vph)					478			4981				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			0				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.59			0.22				

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 2044: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2022 Build - AM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	16	12	12	10	12
Storage Length (ft)	30	0		0	0	
Storage Lanes	0	0		0	0	
Taper Length (ft)	25				25	
Right Turn on Red	Yes	Yes		Yes		
Link Speed (mph)	25		40			40
Link Distance (ft)	76		1017			813
Travel Time (s)	2.1		17.3			13.9
Lane Group Flow (vph)	107	0	0	0	0	4034
v/c Ratio	0.19					0.78
Control Delay	7.8					16.3
Queue Delay	0.0					0.2
Total Delay	7.8					16.5
Queue Length 50th (ft)	15					504
Queue Length 95th (ft)	17					533
Internal Link Dist (ft)	1		937			733
Turn Bay Length (ft)	30					
Base Capacity (vph)	559					5199
Starvation Cap Reductn	0					406
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.19					0.84

Intersection Summary

Area Type:	Other
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Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↗			↕			↕	
Traffic Vol, veh/h	19	69	0	0	233	19	13	0	10	9	1	7
Future Vol, veh/h	19	69	0	0	233	19	13	0	10	9	1	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	21	75	0	0	253	21	14	0	11	10	1	8

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	274	0	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	-
Pot Cap-1 Maneuver	1289	-	0	0
Stage 1	-	-	0	0
Stage 2	-	-	0	0
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1289	-	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.7	0	10.4	10.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	689	1289	-	-	-	630
HCM Lane V/C Ratio	0.036	0.016	-	-	-	0.029
HCM Control Delay (s)	10.4	7.8	0	-	-	10.9
HCM Lane LOS	B	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	-	0.1

Used pseudo SBT volume of 1 to prevent fatal error from occurring in SimTraffic.

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Traffic Vol, veh/h	19	68	244	57	22	8
Future Vol, veh/h	19	68	244	57	22	8
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	225
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	21	74	265	62	24	9





















Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	327	0	-	0	412 296
Stage 1	-	-	-	-	296 -
Stage 2	-	-	-	-	116 -
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	1233	-	-	-	596 743
Stage 1	-	-	-	-	755 -
Stage 2	-	-	-	-	909 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1233	-	-	-	585 743
Mov Cap-2 Maneuver	-	-	-	-	585 -
Stage 1	-	-	-	-	741 -
Stage 2	-	-	-	-	909 -

Approach	EB	WB	SB
HCM Control Delay, s	1.7	0	11
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1233	-	-	-	585	743
HCM Lane V/C Ratio	0.017	-	-	-	0.041	0.012
HCM Control Delay (s)	8	0	-	-	11.4	9.9
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	0

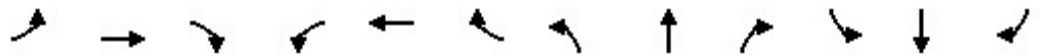
Lanes, Volumes, Timings
1059: John R St & W State Fair Ave

Project Panda
2022 Build - AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	10	11	11	10	12	12	10	12	12	10	12	12
Storage Length (ft)	50		0	50		0	70		0	70		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1146			1401			1021			1264	
Travel Time (s)		26.0			31.8			23.2			28.7	
Lane Group Flow (vph)	11	88	0	37	277	0	36	114	0	15	141	0
v/c Ratio	0.03	0.13		0.07	0.38		0.08	0.15		0.03	0.20	
Control Delay	10.1	9.5		10.4	12.5		10.2	8.8		9.6	10.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.1	9.5		10.4	12.5		10.2	8.8		9.6	10.0	
Queue Length 50th (ft)	2	14		7	53		6	16		3	23	
Queue Length 95th (ft)	9	32		17	80		20	40		11	50	
Internal Link Dist (ft)		1066			1321			941			1184	
Turn Bay Length (ft)	50			50			70			70		
Base Capacity (vph)	323	695		499	732		449	748		461	705	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.03	0.13		0.07	0.38		0.08	0.15		0.03	0.20	
Intersection Summary												
Area Type:	Other											

Lanes, Volumes, Timings

1404: SB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]/WB M-102 [8 Mile Srv Rd]



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	14	12	14	9	12	12	12	12	12	11	13
Storage Length (ft)	0		0	110		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		1243			174			245				469
Travel Time (s)		21.2			3.0			4.2				8.0
Lane Group Flow (vph)	0	0	0	184	382	0	0	0	0	0	723	0
v/c Ratio				0.16	0.19							0.58
Control Delay				4.0	5.6							23.0
Queue Delay				1.3	0.9							0.0
Total Delay				5.3	6.4							23.0
Queue Length 50th (ft)				19	32							89
Queue Length 95th (ft)				51	56							127
Internal Link Dist (ft)		1163			94			165				389
Turn Bay Length (ft)				110								
Base Capacity (vph)				1166	2029							1247
Starvation Cap Reductn				793	1332							0
Spillback Cap Reductn				0	0							0
Storage Cap Reductn				0	0							0
Reduced v/c Ratio				0.49	0.55							0.58

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 1804: NB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2022 Build - AM Peak Hour















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	14	9	9	12	12	12	11	11	11	12	12	12
Storage Length (ft)	110		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		166			1129			1294				234
Travel Time (s)		2.8			19.2			22.1				4.0
Lane Group Flow (vph)	259	536	0	0	0	0	0	650	0	0	0	0
v/c Ratio	0.22	0.26						0.53				
Control Delay	2.1	2.9						23.3				
Queue Delay	1.2	0.7						0.0				
Total Delay	3.3	3.6						23.3				
Queue Length 50th (ft)	13	22						83				
Queue Length 95th (ft)	32	36						119				
Internal Link Dist (ft)		86			1049			1214				154
Turn Bay Length (ft)	110											
Base Capacity (vph)	1171	2037						1228				
Starvation Cap Reductn	690	1111						0				
Spillback Cap Reductn	0	0						0				
Storage Cap Reductn	0	0						0				
Reduced v/c Ratio	0.54	0.58						0.53				

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 2915: Market Place Dr/Crossover & EB M-102 [8 Mile Rd]

Project Panda
 2022 Build - AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑	↗						↖↖	↘	↑	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	14	12	12	12	12	12	11	16	16	16
Storage Length (ft)	0		280	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		2	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			No	No		Yes
Link Speed (mph)		40			40			25				40
Link Distance (ft)		289			679			334				90
Travel Time (s)		4.9			11.6			9.1				1.5
Lane Group Flow (vph)	0	2452	60	0	0	0	0	0	61	77	73	0
v/c Ratio		0.41	0.04						0.38	0.53	0.48	
Control Delay		4.5	0.9						79.4	85.2	81.9	
Queue Delay		0.0	0.0						0.0	0.0	0.0	
Total Delay		4.5	0.9						79.4	85.2	81.9	
Queue Length 50th (ft)		98	1						35	79	75	
Queue Length 95th (ft)		138	6						64	136	130	
Internal Link Dist (ft)		209			599			254				10
Turn Bay Length (ft)			280									
Base Capacity (vph)		6224	1406						248	184	194	
Starvation Cap Reductn		0	0						0	0	0	
Spillback Cap Reductn		0	0						0	0	0	
Storage Cap Reductn		0	0						0	0	0	
Reduced v/c Ratio		0.39	0.04						0.25	0.42	0.38	
Intersection Summary												
Area Type:	Other											



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	16	12	12	12
Storage Length (ft)		0	230		0	0
Storage Lanes		0	2		0	0
Taper Length (ft)			25		25	
Link Speed (mph)	40			40	40	
Link Distance (ft)	311			682	90	
Travel Time (s)	5.3			11.6	1.5	
Lane Group Flow (vph)	0	0	150	3271	0	0
Intersection Summary						
Area Type:	Other					

Lanes, Volumes, Timings
 4046: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2022 Build - AM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	3800
Future Volume (vph)	0	0	0	0	0	3800
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Satd. Flow (prot)	2222	0	0	0	0	7941
Flt Permitted						
Satd. Flow (perm)	2222	0	0	0	0	7941
Link Speed (mph)	25		40			40
Link Distance (ft)	111		488			826
Travel Time (s)	3.0		8.3			14.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	4130
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.9%
ICU Level of Service	A
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Queues on the major and minor streets should be 0 FT as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
 4946: NB M-1 [Woodward Ave] & Crossover/State Fair Gate #5

Project Panda
 2022 Build - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↑↑↑↑				
Traffic Volume (vph)	0	0	0	0	0	0	0	1038	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	1038	0	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	12	12
Satd. Flow (prot)	0	0	0	0	2222	0	0	7941	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	2222	0	0	7941	0	0	0	0
Link Speed (mph)		25			25			40				40
Link Distance (ft)		111			711			473				267
Travel Time (s)		3.0			19.4			8.1				4.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	1128	0	0	0	0
Sign Control		Free			Stop			Free				Free



















Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.9%
ICU Level of Service	A
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Queues on the major and minor streets should be 0 FT as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
 1915: Site Driveway A/Crossover & 8 Mile Srv Rd (EB)

Project Panda
 2022 Build - PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	14	12	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	325		275	0		0	0		0	0		0
Storage Lanes	2		0	0		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			No
Link Speed (mph)		40			40			25				25
Link Distance (ft)		674			2304			449				96
Travel Time (s)		11.5			39.3			12.2				2.6
Lane Group Flow (vph)	332	2873	0	0	0	0	0	62	125	0	71	0
v/c Ratio	0.64	0.70						0.29	0.30		0.11	
Control Delay	31.8	11.9						36.6	1.8		0.4	
Queue Delay	0.0	0.0						0.0	0.0		0.0	
Total Delay	31.8	11.9						36.6	1.8		0.4	
Queue Length 50th (ft)	84	297						29	0		0	
Queue Length 95th (ft)	m108	310						65	0		1	
Internal Link Dist (ft)		594			2224			369			16	
Turn Bay Length (ft)	325											
Base Capacity (vph)	515	4087						215	422		619	
Starvation Cap Reductn	0	0						0	0		0	
Spillback Cap Reductn	0	0						0	0		0	
Storage Cap Reductn	0	0						0	0		0	
Reduced v/c Ratio	0.64	0.70						0.29	0.30		0.11	

Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
 1015: Crossover/Driveway & E 8 Mile Rd (WB)

Project Panda
 2022 Build - PM Peak Hour






















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	11	12	14	14	14	11	11	11
Storage Length (ft)	0		0	150		0	0		0	0		0
Storage Lanes	0		0	2		0	2		0	0		1
Taper Length (ft)	25			100			25			25		
Right Turn on Red			Yes			Yes			Yes			No
Link Speed (mph)		40			40			25				25
Link Distance (ft)		673			2329			96				286
Travel Time (s)		11.5			39.7			2.6				7.8
Lane Group Flow (vph)	0	0	0	71	2938	0	393	0	0	0	0	12
v/c Ratio				0.15	0.87		0.29					0.02
Control Delay				31.9	20.9		0.9					17.5
Queue Delay				0.0	0.0		0.0					0.0
Total Delay				31.9	20.9		0.9					17.5
Queue Length 50th (ft)				16	353		0					4
Queue Length 95th (ft)				35	410		0					15
Internal Link Dist (ft)		593			2249			16				206
Turn Bay Length (ft)				150								
Base Capacity (vph)				465	3365		1334					567
Starvation Cap Reductn				0	0		0					0
Spillback Cap Reductn				0	0		0					0
Storage Cap Reductn				0	0		0					0
Reduced v/c Ratio				0.15	0.87		0.29					0.02

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 1704: NB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]

Project Panda
 2022 Build - PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  		 	 				
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	12	12	14	12	12	12	12	12
Storage Length (ft)	0		0	875		0	90		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		174			1335			234				818
Travel Time (s)		3.0			22.8			4.0				13.9
Lane Group Flow (vph)	0	0	0	0	683	0	372	776	0	0	0	0
v/c Ratio					0.54		0.29	0.34				
Control Delay					17.0		0.5	1.8				
Queue Delay					0.0		0.7	0.7				
Total Delay					17.0		1.1	2.5				
Queue Length 50th (ft)					60		1	25				
Queue Length 95th (ft)					95		m1	24				
Internal Link Dist (ft)		94			1255			154				738
Turn Bay Length (ft)							90					
Base Capacity (vph)					1265		1296	2298				
Starvation Cap Reductn					0		588	1116				
Spillback Cap Reductn					0		0	0				
Storage Cap Reductn					0		0	0				
Reduced v/c Ratio					0.54		0.53	0.66				

Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
 1904: SB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2022 Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑								↘	↙↑	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	11	11	11	12	12	12	12	12	12	16	14	14
Storage Length (ft)	0		900	0		0	0		0	90		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		1292			166			808				245
Travel Time (s)		22.0			2.8			13.8				4.2
Lane Group Flow (vph)	0	683	0	0	0	0	0	0	0	246	506	0
v/c Ratio		0.56								0.20	0.21	
Control Delay		24.7								0.7	1.3	
Queue Delay		0.0								0.8	0.5	
Total Delay		24.7								1.6	1.7	
Queue Length 50th (ft)		91								1	9	
Queue Length 95th (ft)		128								m3	11	
Internal Link Dist (ft)		1212			86			728				165
Turn Bay Length (ft)										90		
Base Capacity (vph)		1215								1234	2372	
Starvation Cap Reductn		0								716	1371	
Spillback Cap Reductn		0								0	0	
Storage Cap Reductn		0								0	0	
Reduced v/c Ratio		0.56								0.47	0.51	

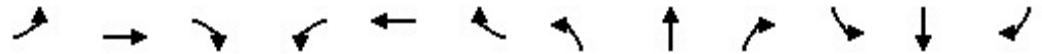
Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
 3945: NB M-1 [Woodward Ave] & Crossover/Site Driveway B

Project Panda
 2022 Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑	↗		↑↑↑↑				
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	16	16	16	12	12	12	12	12	12
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		30			25			40				40
Link Distance (ft)		98			1019			842				525
Travel Time (s)		2.2			27.8			14.4				8.9
Lane Group Flow (vph)	0	0	0	0	62	78	0	4028	0	0	0	0
v/c Ratio					0.12	0.17		0.82				
Control Delay					31.4	21.8		16.2				
Queue Delay					0.0	0.0		0.0				
Total Delay					31.4	21.8		16.2				
Queue Length 50th (ft)					31	25		445				
Queue Length 95th (ft)					66	63		483				
Internal Link Dist (ft)		18			939			762				445
Turn Bay Length (ft)												
Base Capacity (vph)					511	456		4939				
Starvation Cap Reductn					0	0		0				
Spillback Cap Reductn					0	0		0				
Storage Cap Reductn					0	0		0				
Reduced v/c Ratio					0.12	0.17		0.82				

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 3045: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2022 Build - PM Peak Hour



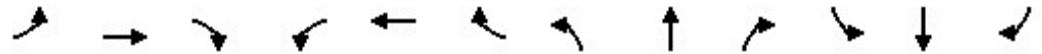
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Right Turn on Red	Yes	Yes		Yes		
Link Speed (mph)	25		40			40
Link Distance (ft)	98		411			581
Travel Time (s)	2.7		7.0			9.9
Lane Group Flow (vph)	62	0	0	0	0	1677
v/c Ratio	0.11					0.34
Control Delay	0.5					9.2
Queue Delay	0.0					0.0
Total Delay	0.5					9.2
Queue Length 50th (ft)	0					115
Queue Length 95th (ft)	0					133
Internal Link Dist (ft)	18		331			501
Turn Bay Length (ft)						
Base Capacity (vph)	570					4947
Starvation Cap Reductn	0					0
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.11					0.34

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 2944: NB M-1 [Woodward Ave] & Crossover/W State Fair Ave

Project Panda
 2022 Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	16	16	13	13	13	12	12	11	12	12	12
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		25			25			40				40
Link Distance (ft)		76			772			1032				842
Travel Time (s)		2.1			21.1			17.6				14.4
Lane Group Flow (vph)	0	0	0	0	302	0	0	3834	0	0	0	0
v/c Ratio					0.71			0.74				
Control Delay					52.3			15.4				
Queue Delay					0.0			0.0				
Total Delay					52.3			15.4				
Queue Length 50th (ft)					216			457				
Queue Length 95th (ft)					318			484				
Internal Link Dist (ft)		1			692			952				762
Turn Bay Length (ft)												
Base Capacity (vph)					428			5178				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			0				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.71			0.74				

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 2044: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2022 Build - PM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	16	12	12	10	12
Storage Length (ft)	30	0		0	0	
Storage Lanes	0	0		0	0	
Taper Length (ft)	25				25	
Right Turn on Red	Yes	Yes		Yes		
Link Speed (mph)	25		40			40
Link Distance (ft)	76		1017			403
Travel Time (s)	2.1		17.3			6.9
Lane Group Flow (vph)	122	0	0	0	0	1685
v/c Ratio	0.21					0.33
Control Delay	0.6					9.6
Queue Delay	0.0					0.0
Total Delay	0.6					9.6
Queue Length 50th (ft)	0					132
Queue Length 95th (ft)	m0					149
Internal Link Dist (ft)	1		937			323
Turn Bay Length (ft)	30					
Base Capacity (vph)	575					5148
Starvation Cap Reductn	0					0
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.21					0.33

Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.

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	10	92	0	0	245	10	18	0	11	19	1	18
Future Vol, veh/h	10	92	0	0	245	10	18	0	11	19	1	18
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	100	0	0	266	11	20	0	12	21	1	20

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	277	0	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	-
Pot Cap-1 Maneuver	1286	-	0	0
Stage 1	-	-	0	0
Stage 2	-	-	0	0
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1286	-	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0	10.9	11.1
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	645	1286	-	-	-	634
HCM Lane V/C Ratio	0.049	0.008	-	-	-	0.065
HCM Control Delay (s)	10.9	7.8	0	-	-	11.1
HCM Lane LOS	B	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	-	0.2

Used pseudo SBT volume of 1 to prevent fatal error from occurring in SimTraffic.

Intersection						
Int Delay, s/veh	1.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↗		↖	↗
Traffic Vol, veh/h	10	111	237	31	55	18
Future Vol, veh/h	10	111	237	31	55	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	225
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	11	121	258	34	60	20





















Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	292	0	-	0	418 275
Stage 1	-	-	-	-	275 -
Stage 2	-	-	-	-	143 -
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	1270	-	-	-	591 764
Stage 1	-	-	-	-	771 -
Stage 2	-	-	-	-	884 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1270	-	-	-	586 764
Mov Cap-2 Maneuver	-	-	-	-	586 -
Stage 1	-	-	-	-	764 -
Stage 2	-	-	-	-	884 -

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	11.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1270	-	-	-	586	764
HCM Lane V/C Ratio	0.009	-	-	-	0.102	0.026
HCM Control Delay (s)	7.9	0	-	-	11.8	9.8
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0	-	-	-	0.3	0.1

Lanes, Volumes, Timings
1059: John R St & W State Fair Ave

Project Panda
2022 Build - PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	10	11	11	10	12	12	10	12	12	10	12	12
Storage Length (ft)	50		0	50		0	70		0	70		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1144			1401			1021			1264	
Travel Time (s)		26.0			31.8			23.2			28.7	
Lane Group Flow (vph)	17	196	0	81	387	0	66	324	0	61	211	0
v/c Ratio	0.06	0.27		0.18	0.52		0.16	0.42		0.16	0.28	
Control Delay	10.6	10.6		11.6	14.2		11.1	11.9		11.2	10.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.6	10.6		11.6	14.2		11.1	11.9		11.2	10.6	
Queue Length 50th (ft)	3	33		15	78		12	58		11	36	
Queue Length 95th (ft)	13	69		37	138		31	106		29	68	
Internal Link Dist (ft)		1064			1321			941			1184	
Turn Bay Length (ft)	50			50			70			70		
Base Capacity (vph)	285	728		451	744		418	767		386	759	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.06	0.27		0.18	0.52		0.16	0.42		0.16	0.28	
Intersection Summary												
Area Type:	Other											

Lanes, Volumes, Timings

1404: SB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]/WB M-102 [8 Mile Srv Rd]



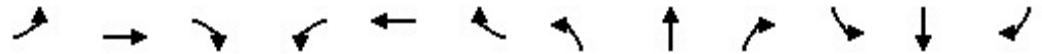
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↙	↕						↕	↘
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	14	12	14	9	12	12	12	12	12	11	13
Storage Length (ft)	0		0	110		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Link Speed (mph)		40			40			40			40	
Link Distance (ft)		1243			174			245			473	
Travel Time (s)		21.2			3.0			4.2			8.1	
Lane Group Flow (vph)	0	0	0	192	497	0	0	0	0	0	847	0
v/c Ratio				0.17	0.24						0.68	
Control Delay				3.7	4.7						25.5	
Queue Delay				1.1	0.7						0.0	
Total Delay				4.8	5.4						25.5	
Queue Length 50th (ft)				20	36						113	
Queue Length 95th (ft)				47	58						156	
Internal Link Dist (ft)		1163			94			165			393	
Turn Bay Length (ft)				110								
Base Capacity (vph)				1156	2032						1248	
Starvation Cap Reductn				752	1146						0	
Spillback Cap Reductn				0	0						0	
Storage Cap Reductn				0	0						0	
Reduced v/c Ratio				0.48	0.56						0.68	

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 1804: NB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2022 Build - PM Peak Hour



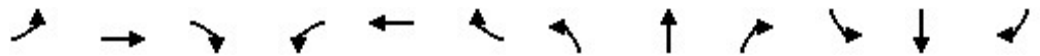
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	14	9	9	12	12	12	11	11	11	12	12	12
Storage Length (ft)	110		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		166			1042			1294				234
Travel Time (s)		2.8			17.8			22.1				4.0
Lane Group Flow (vph)	314	652	0	0	0	0	0	893	0	0	0	0
v/c Ratio	0.27	0.32						0.75				
Control Delay	3.2	3.4						31.1				
Queue Delay	1.3	0.7						0.0				
Total Delay	4.5	4.2						31.1				
Queue Length 50th (ft)	20	25						141				
Queue Length 95th (ft)	51	50						187				
Internal Link Dist (ft)		86			962			1214				154
Turn Bay Length (ft)	110											
Base Capacity (vph)	1157	2028						1198				
Starvation Cap Reductn	628	988						0				
Spillback Cap Reductn	0	0						0				
Storage Cap Reductn	0	0						0				
Reduced v/c Ratio	0.59	0.63						0.75				

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 2915: Market Place Dr/Crossover & EB M-102 [8 Mile Rd]

Project Panda
 2022 Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑	↗						↘↘	↘	↑	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	14	12	12	12	12	12	11	16	16	16
Storage Length (ft)	0		280	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		2	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			No	No		Yes
Link Speed (mph)		40			40			25				40
Link Distance (ft)		266			674			385				86
Travel Time (s)		4.5			11.5			10.5				1.5
Lane Group Flow (vph)	0	2907	129	0	0	0	0	0	228	71	125	0
v/c Ratio		0.54	0.10						0.92	0.42	0.71	
Control Delay		6.8	0.9						110.8	77.6	93.1	
Queue Delay		0.0	0.0						0.0	0.0	0.0	
Total Delay		6.8	0.9						110.8	77.6	93.1	
Queue Length 50th (ft)		159	1						136	71	129	
Queue Length 95th (ft)		167	m9						#230	127	203	
Internal Link Dist (ft)		186			594			305				6
Turn Bay Length (ft)			280									
Base Capacity (vph)		5401	1250						248	184	194	
Starvation Cap Reductn		0	0						0	0	0	
Spillback Cap Reductn		0	0						0	0	0	
Storage Cap Reductn		0	0						0	0	0	
Reduced v/c Ratio		0.54	0.10						0.92	0.39	0.64	

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	16	12	12	12
Storage Length (ft)		0	230		0	0
Storage Lanes		0	2		0	0
Taper Length (ft)			25		25	
Link Speed (mph)	40			40	40	
Link Distance (ft)	320			673	86	
Travel Time (s)	5.5			11.5	1.5	
Lane Group Flow (vph)	0	0	196	3143	0	0

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 4046: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2022 Build - PM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	1543
Future Volume (vph)	0	0	0	0	0	1543
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Satd. Flow (prot)	2222	0	0	0	0	7941
Flt Permitted						
Satd. Flow (perm)	2222	0	0	0	0	7941
Link Speed (mph)	25		40			40
Link Distance (ft)	133		581			733
Travel Time (s)	3.6		9.9			12.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	1677
Sign Control	Stop		Free			Free

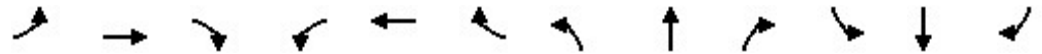
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.0%
ICU Level of Service	A
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Queues on the major and minor streets should be 0 FT as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
 4946: NB M-1 [Woodward Ave] & Crossover/State Fair Gate #5

Project Panda
 2022 Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↑↑↑↑↔				
Traffic Volume (vph)	0	0	0	0	0	0	0	3721	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	3721	0	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	12	12
Satd. Flow (prot)	0	0	0	0	2222	0	0	7941	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	2222	0	0	7941	0	0	0	0
Link Speed (mph)		25			25			40				40
Link Distance (ft)		133			741			525				217
Travel Time (s)		3.6			20.2			8.9				3.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	4045	0	0	0	0
Sign Control		Free			Stop			Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.0%
ICU Level of Service	A
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Queues on the major and minor streets should be 0 FT as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

APPENDIX – J

2032 Master Plan Build Capacity Analysis

HCM Signalized Intersection Capacity Analysis
 1915: Site Driveway A/Crossover & 8 Mile Srv Rd (EB)

Project Panda
 2032 Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	145	2336	146	0	0	0	0	28	58	0	157	0
Future Volume (vph)	145	2336	146	0	0	0	0	28	58	0	157	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	14	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	8.3	5.7						5.2	5.2		5.7	
Lane Util. Factor	0.97	0.81						1.00	1.00		0.95	
Frt	1.00	0.99						1.00	0.85		1.00	
Flt Protected	0.95	1.00						1.00	1.00		1.00	
Satd. Flow (prot)	3855	7871						1961	1667		3725	
Flt Permitted	0.95	1.00						1.00	1.00		1.00	
Satd. Flow (perm)	3855	7871						1961	1667		3725	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	2539	159	0	0	0	0	30	63	0	171	0
RTOR Reduction (vph)	0	17	0	0	0	0	0	0	57	0	0	0
Lane Group Flow (vph)	158	2681	0	0	0	0	0	30	6	0	171	0
Turn Type	Prot	NA						NA	Perm		NA	
Protected Phases	7	5 7						8		6	6	
Permitted Phases									8			
Actuated Green, G (s)	8.7	41.3						7.8	7.8		14.3	
Effective Green, g (s)	8.7	33.0						7.8	7.8		14.3	
Actuated g/C Ratio	0.11	0.41						0.10	0.10		0.18	
Clearance Time (s)	8.3							5.2	5.2		5.7	
Lane Grp Cap (vph)	419	3246						191	162		665	
v/s Ratio Prot	0.04	c0.34						c0.02			c0.05	
v/s Ratio Perm									0.00			
v/c Ratio	0.38	0.83						0.16	0.04		0.26	
Uniform Delay, d1	33.1	20.9						33.1	32.7		28.3	
Progression Factor	1.07	0.75						1.00	1.00		0.00	
Incremental Delay, d2	2.4	2.3						1.7	0.4		0.9	
Delay (s)	37.9	18.0						34.8	33.1		0.9	
Level of Service	D	B						C	C		A	
Approach Delay (s)		19.1			0.0			33.7			0.9	
Approach LOS		B			A			C			A	

Intersection Summary

HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	27.9
Intersection Capacity Utilization	98.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1015: Crossover/Driveway & E 8 Mile Rd (WB)

Project Panda
 2032 Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations				↔↔	↑↑↑		↔↔					↔	
Traffic Volume (vph)	0	0	0	157	3269	13	173	0	0	0	0	4	
Future Volume (vph)	0	0	0	157	3269	13	173	0	0	0	0	4	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	12	12	12	12	11	12	14	14	14	11	11	11	
Total Lost time (s)				8.7	5.7		5.3					5.3	
Lane Util. Factor				0.97	0.86		0.97					1.00	
Flt				1.00	1.00		1.00					0.86	
Flt Protected				0.95	1.00		0.95					1.00	
Satd. Flow (prot)				3614	6516		3855					1640	
Flt Permitted				0.95	1.00		0.95					1.00	
Satd. Flow (perm)				3614	6516		3855					1640	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	171	3553	14	188	0	0	0	0	4	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	0	0	171	3567	0	188	0	0	0	0	4	
Turn Type				Prot	NA		Prot					Perm	
Protected Phases				2	1 2		4						
Permitted Phases												4	
Actuated Green, G (s)				11.3	41.3		24.7					24.7	
Effective Green, g (s)				11.3	41.3		24.7					24.7	
Actuated g/C Ratio				0.14	0.52		0.31					0.31	
Clearance Time (s)				8.7			5.3					5.3	
Lane Grp Cap (vph)				510	3363		1190					506	
v/s Ratio Prot				0.05	c0.55		c0.05						
v/s Ratio Perm												0.00	
v/c Ratio				0.34	1.06		0.16					0.01	
Uniform Delay, d1				31.0	19.4		20.1					19.2	
Progression Factor				1.00	1.00		0.02					1.00	
Incremental Delay, d2				1.8	34.6		0.3					0.0	
Delay (s)				32.7	54.0		0.7					19.2	
Level of Service				C	D		A					B	
Approach Delay (s)		0.0			53.0			0.7			19.2		
Approach LOS		A			D			A			B		
Intersection Summary													
HCM 2000 Control Delay			50.5		HCM 2000 Level of Service						D		
HCM 2000 Volume to Capacity ratio			0.92										
Actuated Cycle Length (s)			80.0		Sum of lost time (s)						27.9		
Intersection Capacity Utilization			98.4%		ICU Level of Service						F		
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1704: NB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]

Project Panda
 2032 Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↑	↑↑				
Traffic Volume (vph)	0	0	0	0	224	418	340	493	0	0	0	0
Future Volume (vph)	0	0	0	0	224	418	340	493	0	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	12	12	14	12	12	12	12	12
Total Lost time (s)					5.7		5.5	5.5				
Lane Util. Factor					0.91		0.91	0.91				
Flt					0.90		1.00	1.00				
Flt Protected					1.00		0.95	0.99				
Satd. Flow (prot)					4830		1808	3546				
Flt Permitted					1.00		0.95	0.99				
Satd. Flow (perm)					4830		1808	3546				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	243	454	370	536	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	292	0	90	14	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	405	0	202	600	0	0	0	0
Turn Type					NA		Split	NA				
Protected Phases					6		5	5				
Permitted Phases												
Actuated Green, G (s)					17.3		51.5	51.5				
Effective Green, g (s)					17.3		51.5	51.5				
Actuated g/C Ratio					0.22		0.64	0.64				
Clearance Time (s)					5.7		5.5	5.5				
Lane Grp Cap (vph)					1044		1163	2282				
v/s Ratio Prot					c0.08		0.11	c0.17				
v/s Ratio Perm												
v/c Ratio					0.39		0.17	0.26				
Uniform Delay, d1					26.8		5.7	6.1				
Progression Factor					1.00		0.17	0.41				
Incremental Delay, d2					1.1		0.3	0.3				
Delay (s)					27.9		1.2	2.8				
Level of Service					C		A	A				
Approach Delay (s)		0.0			27.9			2.3			0.0	
Approach LOS		A			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			13.4		HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio			0.29									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)			11.2				
Intersection Capacity Utilization			54.0%		ICU Level of Service			A				
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1904: SB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2032 Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑								↖	↗↑	
Traffic Volume (vph)	0	405	287	0	0	0	0	0	0	397	287	0
Future Volume (vph)	0	405	287	0	0	0	0	0	0	397	287	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	11	11	11	12	12	12	12	12	12	16	14	14
Total Lost time (s)		5.8								5.5	5.5	
Lane Util. Factor		0.91								0.91	0.91	
Frt		0.94								1.00	1.00	
Flt Protected		1.00								0.95	0.98	
Satd. Flow (prot)		4852								1921	3736	
Flt Permitted		1.00								0.95	0.98	
Satd. Flow (perm)		4852								1921	3736	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	440	312	0	0	0	0	0	0	432	312	0
RTOR Reduction (vph)	0	160	0	0	0	0	0	0	0	31	31	0
Lane Group Flow (vph)	0	592	0	0	0	0	0	0	0	211	471	0
Turn Type		NA								Split	NA	
Protected Phases		12								11	11	
Permitted Phases												
Actuated Green, G (s)		18.2								50.5	50.5	
Effective Green, g (s)		18.2								50.5	50.5	
Actuated g/C Ratio		0.23								0.63	0.63	
Clearance Time (s)		5.8								5.5	5.5	
Lane Grp Cap (vph)		1103								1212	2358	
v/s Ratio Prot		c0.12								0.11	c0.13	
v/s Ratio Perm												
v/c Ratio		0.54								0.17	0.20	
Uniform Delay, d1		27.2								6.1	6.2	
Progression Factor		1.00								0.07	0.21	
Incremental Delay, d2		1.9								0.3	0.2	
Delay (s)		29.1								0.7	1.5	
Level of Service		C								A	A	
Approach Delay (s)		29.1			0.0			0.0			1.2	
Approach LOS		C			A			A			A	
Intersection Summary												
HCM 2000 Control Delay			15.2		HCM 2000 Level of Service						B	
HCM 2000 Volume to Capacity ratio			0.29									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)						11.3	
Intersection Capacity Utilization			35.3%		ICU Level of Service						A	
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3945: NB M-1 [Woodward Ave] & Crossover/Site Driveway B

Project Panda
 2032 Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑	↗		↑↑↑↑				
Traffic Volume (vph)	0	0	0	0	39	45	0	1096	91	0	0	0
Future Volume (vph)	0	0	0	0	39	45	0	1096	91	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	16	16	16	12	12	12	12	12	12
Total Lost time (s)					9.0	9.0		5.7				
Lane Util. Factor					1.00	1.00		0.81				
Fr _t					1.00	0.85		0.99				
Fl _t Protected					1.00	1.00		1.00				
Satd. Flow (prot)					2222	1889		7850				
Fl _t Permitted					1.00	1.00		1.00				
Satd. Flow (perm)					2222	1889		7850				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	42	49	0	1191	99	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	36	0	17	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	42	13	0	1273	0	0	0	0
Turn Type					NA	Perm		NA				
Protected Phases					4			2				
Permitted Phases						4						
Actuated Green, G (s)					23.0	23.0		52.3				
Effective Green, g (s)					23.0	23.0		52.3				
Actuated g/C Ratio					0.26	0.26		0.58				
Clearance Time (s)					9.0	9.0		5.7				
Lane Grp Cap (vph)					567	482		4561				
v/s Ratio Prot					c0.02			c0.16				
v/s Ratio Perm						0.01						
v/c Ratio					0.07	0.03		0.28				
Uniform Delay, d1					25.4	25.1		9.4				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					0.3	0.1		0.2				
Delay (s)					25.7	25.2		9.6				
Level of Service					C	C		A				
Approach Delay (s)		0.0			25.4			9.6			0.0	
Approach LOS		A			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			10.6		HCM 2000 Level of Service				B			
HCM 2000 Volume to Capacity ratio			0.22									
Actuated Cycle Length (s)			90.0		Sum of lost time (s)				14.7			
Intersection Capacity Utilization			59.9%		ICU Level of Service				B			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3045: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 Build - AM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶					↑↑↑↑
Traffic Volume (vph)	39	0	0	0	0	4172
Future Volume (vph)	39	0	0	0	0	4172
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	16	12	12	12	12	12
Total Lost time (s)	6.0					5.7
Lane Util. Factor	1.00					0.81
Fr _t	1.00					1.00
Fl _t Protected	0.95					1.00
Satd. Flow (prot)	2111					7941
Fl _t Permitted	0.95					1.00
Satd. Flow (perm)	2111					7941
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	0	0	0	0	4535
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	42	0	0	0	0	4535
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Actuated Green, G (s)	26.0					52.3
Effective Green, g (s)	26.0					52.3
Actuated g/C Ratio	0.29					0.58
Clearance Time (s)	6.0					5.7
Lane Grp Cap (vph)	609					4614
v/s Ratio Prot	c0.02					c0.57
v/s Ratio Perm						
v/c Ratio	0.07					0.98
Uniform Delay, d ₁	23.2					18.4
Progression Factor	0.00					1.00
Incremental Delay, d ₂	0.2					9.8
Delay (s)	0.3					28.2
Level of Service	A					C
Approach Delay (s)	0.3		0.0		28.2	
Approach LOS	A		A		C	

Intersection Summary

HCM 2000 Control Delay	28.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.7
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2944: NB M-1 [Woodward Ave] & Crossover/W State Fair Ave

Project Panda
 2032 Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					←			↑↑↑↑				
Traffic Volume (vph)	0	0	0	0	105	172	0	1016	102	0	0	0
Future Volume (vph)	0	0	0	0	105	172	0	1016	102	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	16	16	16	13	13	13	12	12	11	12	12	12
Total Lost time (s)					8.8			5.2				
Lane Util. Factor					1.00			0.81				
Frbp, ped/bikes					0.99			1.00				
Flpb, ped/bikes					1.00			1.00				
Frt					0.92			0.99				
Flt Protected					1.00			1.00				
Satd. Flow (prot)					1827			7655				
Flt Permitted					1.00			1.00				
Satd. Flow (perm)					1827			7655				
Peak-hour factor, PHF	0.63	0.63	0.63	0.90	0.90	0.90	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	0	117	191	0	1104	111	0	0	0
RTOR Reduction (vph)	0	0	0	0	49	0	0	15	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	259	0	0	1200	0	0	0	0
Confl. Peds. (#/hr)	5						5		23	23		
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	4%	0%	4%	4%	0%	0%	0%
Turn Type					NA			NA				
Protected Phases					4			2				
Permitted Phases												
Actuated Green, G (s)					28.2			77.8				
Effective Green, g (s)					28.2			77.8				
Actuated g/C Ratio					0.23			0.65				
Clearance Time (s)					8.8			5.2				
Lane Grp Cap (vph)					429			4962				
v/s Ratio Prot					c0.14			c0.16				
v/s Ratio Perm												
v/c Ratio					0.60			0.24				
Uniform Delay, d1					40.9			8.8				
Progression Factor					1.00			1.00				
Incremental Delay, d2					6.2			0.1				
Delay (s)					47.1			8.9				
Level of Service					D			A				
Approach Delay (s)		0.0			47.1			8.9			0.0	
Approach LOS		A			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			16.6		HCM 2000 Level of Service				B			
HCM 2000 Volume to Capacity ratio			0.34									
Actuated Cycle Length (s)			120.0		Sum of lost time (s)				14.0			
Intersection Capacity Utilization			63.9%		ICU Level of Service				B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 2044: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 Build - AM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶					↑↑↑↑
Traffic Volume (vph)	105	0	0	0	0	4211
Future Volume (vph)	105	0	0	0	0	4211
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	16	16	12	12	10	12
Total Lost time (s)	5.8					5.2
Lane Util. Factor	1.00					0.81
Frpb, ped/bikes	1.00					1.00
Flpb, ped/bikes	1.00					1.00
Fr _t	1.00					1.00
Fl _t Protected	0.95					1.00
Satd. Flow (prot)	2153					8020
Fl _t Permitted	0.95					1.00
Satd. Flow (perm)	2153					8020
Peak-hour factor, PHF	0.90	0.90	0.92	0.92	0.63	0.95
Adj. Flow (vph)	117	0	0	0	0	4433
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	117	0	0	0	0	4433
Confl. Peds. (#/hr)	5	5		23	23	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Actuated Green, G (s)	31.2					77.8
Effective Green, g (s)	31.2					77.8
Actuated g/C Ratio	0.26					0.65
Clearance Time (s)	5.8					5.2
Lane Grp Cap (vph)	559					5199
v/s Ratio Prot	c0.05					c0.55
v/s Ratio Perm						
v/c Ratio	0.21					0.85
Uniform Delay, d1	34.7					16.6
Progression Factor	0.19					1.00
Incremental Delay, d2	0.6					1.9
Delay (s)	7.1					18.5
Level of Service	A					B
Approach Delay (s)	7.1		0.0			18.5
Approach LOS	A		A			B
Intersection Summary						
HCM 2000 Control Delay			18.2		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.69			
Actuated Cycle Length (s)			120.0		Sum of lost time (s)	14.0
Intersection Capacity Utilization			63.9%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis
 9006: Ralston St/Site Driveway C & W State Fair Ave

Project Panda
 2032 Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	24	79	0	0	255	24	15	0	11	10	1	8
Future Volume (Veh/h)	24	79	0	0	255	24	15	0	11	10	1	8
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	86	0	0	277	26	16	0	12	11	1	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		772										
pX, platoon unblocked												
vC, conflicting volume	303			86			438	441	86	440	428	290
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	303			86			438	441	86	440	428	290
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			97	100	99	98	100	99
cM capacity (veh/h)	1258			1510			514	500	973	513	508	749
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	112	303	28	21								
Volume Left	26	0	16	11								
Volume Right	0	26	12	9								
cSH	1258	1700	644	593								
Volume to Capacity	0.02	0.18	0.04	0.04								
Queue Length 95th (ft)	2	0	3	3								
Control Delay (s)	2.0	0.0	10.8	11.3								
Lane LOS	A		B	B								
Approach Delay (s)	2.0	0.0	10.8	11.3								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			32.7%		ICU Level of Service				A			
Analysis Period (min)			15									

Used pseudo SBT volume of 1 to prevent fatal error from occurring in SimTraffic.

HCM Unsignalized Intersection Capacity Analysis
 9007: W State Fair Ave & Site Driveway D

Project Panda
 2032 Build - AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Traffic Volume (veh/h)	24	75	270	71	26	9
Future Volume (Veh/h)	24	75	270	71	26	9
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	82	293	77	28	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						9
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	370				466	332
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	370				466	332
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				95	99
cM capacity (veh/h)	1189				543	710
Direction, Lane #						
	EB 1	WB 1	SB 1			
Volume Total	108	370	38			
Volume Left	26	0	28			
Volume Right	0	77	10			
cSH	1189	1700	737			
Volume to Capacity	0.02	0.22	0.05			
Queue Length 95th (ft)	2	0	4			
Control Delay (s)	2.1	0.0	11.5			
Lane LOS	A		B			
Approach Delay (s)	2.1	0.0	11.5			
Approach LOS			B			
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			33.6%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis
1059: John R St & W State Fair Ave

Project Panda
2032 Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	66	12	28	203	24	37	81	21	13	111	11
Future Volume (vph)	9	66	12	28	203	24	37	81	21	13	111	11
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	10	11	11	10	12	12	10	12	12	10	12	12
Total Lost time (s)	5.9	5.9		5.9	5.9		5.3	5.3		5.3	5.3	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1366	1798		1773	1894		1624	1864		1627	1772	
Flt Permitted	0.57	1.00		0.70	1.00		0.67	1.00		0.68	1.00	
Satd. Flow (perm)	820	1798		1299	1894		1139	1864		1170	1772	
Peak-hour factor, PHF	0.83	0.83	0.83	0.76	0.76	0.76	0.89	0.89	0.89	0.86	0.86	0.86
Adj. Flow (vph)	11	80	14	37	267	32	42	91	24	15	129	13
RTOR Reduction (vph)	0	9	0	0	9	0	0	15	0	0	7	0
Lane Group Flow (vph)	11	85	0	37	290	0	42	100	0	15	135	0
Confl. Peds. (#/hr)	7					7	2					2
Heavy Vehicles (%)	29%	6%	0%	0%	4%	0%	9%	5%	0%	9%	10%	22%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	19.1	19.1		19.1	19.1		19.7	19.7		19.7	19.7	
Effective Green, g (s)	19.1	19.1		19.1	19.1		19.7	19.7		19.7	19.7	
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.39	0.39		0.39	0.39	
Clearance Time (s)	5.9	5.9		5.9	5.9		5.3	5.3		5.3	5.3	
Lane Grp Cap (vph)	313	686		496	723		448	734		460	698	
v/s Ratio Prot		0.05			c0.15			0.05			c0.08	
v/s Ratio Perm	0.01			0.03			0.04			0.01		
v/c Ratio	0.04	0.12		0.07	0.40		0.09	0.14		0.03	0.19	
Uniform Delay, d1	9.7	10.0		9.8	11.3		9.5	9.7		9.3	9.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.4		0.3	1.7		0.4	0.4		0.1	0.6	
Delay (s)	9.9	10.4		10.1	12.9		9.9	10.1		9.4	10.6	
Level of Service	A	B		B	B		A	B		A	B	
Approach Delay (s)		10.3			12.6			10.1			10.4	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			11.3				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.30									
Actuated Cycle Length (s)			50.0			Sum of lost time (s)				11.2		
Intersection Capacity Utilization			42.0%			ICU Level of Service				A		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

Project Panda

1404: SB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]/WB M-102 [8 Mile Srv Rd]



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↙	↕						↕	↘
Traffic Volume (vph)	0	0	0	212	352	0	0	0	0	0	468	264
Future Volume (vph)	0	0	0	212	352	0	0	0	0	0	468	264
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	14	12	14	9	12	12	12	12	12	11	13
Total Lost time (s)				5.6	5.6						5.7	
Lane Util. Factor				0.91	0.91						0.91	
Flt				1.00	1.00						0.95	
Flt Protected				0.95	1.00						1.00	
Satd. Flow (prot)				1808	3199						4895	
Flt Permitted				0.95	1.00						1.00	
Satd. Flow (perm)				1808	3199						4895	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	230	383	0	0	0	0	0	509	287
RTOR Reduction (vph)	0	0	0	20	14	0	0	0	0	0	128	0
Lane Group Flow (vph)	0	0	0	178	401	0	0	0	0	0	668	0
Turn Type				Split	NA						NA	
Protected Phases				10	10						9	
Permitted Phases												
Actuated Green, G (s)				50.4	50.4						18.3	
Effective Green, g (s)				50.4	50.4						18.3	
Actuated g/C Ratio				0.63	0.63						0.23	
Clearance Time (s)				5.6	5.6						5.7	
Lane Grp Cap (vph)				1139	2015						1119	
v/s Ratio Prot				0.10	c0.13						c0.14	
v/s Ratio Perm												
v/c Ratio				0.16	0.20						0.60	
Uniform Delay, d1				6.1	6.3						27.6	
Progression Factor				1.08	1.04						1.00	
Incremental Delay, d2				0.3	0.2						2.4	
Delay (s)				6.8	6.7						29.9	
Level of Service				A	A						C	
Approach Delay (s)		0.0			6.8			0.0			29.9	
Approach LOS		A			A			A			C	
Intersection Summary												
HCM 2000 Control Delay			19.8		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.30									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)				11.3			
Intersection Capacity Utilization			35.3%		ICU Level of Service				A			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1804: NB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2032 Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↖↗						↖↗↘				
Traffic Volume (vph)	379	423	0	0	0	0	0	455	197	0	0	0
Future Volume (vph)	379	423	0	0	0	0	0	455	197	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	14	9	9	12	12	12	11	11	11	12	12	12
Total Lost time (s)	5.4	5.4						5.7				
Lane Util. Factor	0.91	0.91						0.91				
Frt	1.00	1.00						0.95				
Flt Protected	0.95	0.99						1.00				
Satd. Flow (prot)	1808	3177						4940				
Flt Permitted	0.95	0.99						1.00				
Satd. Flow (perm)	1808	3177						4940				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	412	460	0	0	0	0	0	495	214	0	0	0
RTOR Reduction (vph)	22	22	0	0	0	0	0	97	0	0	0	0
Lane Group Flow (vph)	262	566	0	0	0	0	0	612	0	0	0	0
Turn Type	Split	NA						NA				
Protected Phases	2	2						1				
Permitted Phases												
Actuated Green, G (s)	50.6	50.6						18.3				
Effective Green, g (s)	50.6	50.6						18.3				
Actuated g/C Ratio	0.63	0.63						0.23				
Clearance Time (s)	5.4	5.4						5.7				
Lane Grp Cap (vph)	1143	2009						1130				
v/s Ratio Prot	0.14	c0.18						c0.12				
v/s Ratio Perm												
v/c Ratio	0.23	0.28						0.54				
Uniform Delay, d1	6.3	6.6						27.2				
Progression Factor	0.48	0.52						1.00				
Incremental Delay, d2	0.4	0.3						1.9				
Delay (s)	3.4	3.7						29.0				
Level of Service	A	A						C				
Approach Delay (s)		3.6			0.0			29.0			0.0	
Approach LOS		A			A			C			A	
Intersection Summary												
HCM 2000 Control Delay			15.0					HCM 2000 Level of Service			B	
HCM 2000 Volume to Capacity ratio			0.35									
Actuated Cycle Length (s)			80.0					Sum of lost time (s)		11.2		
Intersection Capacity Utilization			47.3%					ICU Level of Service		A		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2915: Market Place Dr/Crossover & EB M-102 [8 Mile Rd]

Project Panda
 2032 Build - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑↑↑	↗						↖↖	↘	↑		
Traffic Volume (vph)	0	2493	55	0	0	0	0	0	56	78	67	0	
Future Volume (vph)	0	2493	55	0	0	0	0	0	56	78	67	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	12	12	14	12	12	12	12	12	11	16	16	16	
Total Lost time (s)		6.2	6.2						6.0	6.0	6.0		
Lane Util. Factor		0.81	1.00						0.88	1.00	1.00		
Fr _t		1.00	0.85						0.85	1.00	1.00		
Fl _t Protected		1.00	1.00						1.00	0.95	1.00		
Satd. Flow (prot)		7941	1778						2836	2111	2222		
Fl _t Permitted		1.00	1.00						1.00	0.95	1.00		
Satd. Flow (perm)		7941	1778						2836	2111	2222		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	2710	60	0	0	0	0	0	61	85	73	0	
RTOR Reduction (vph)	0	0	16	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	2710	44	0	0	0	0	0	61	85	73	0	
Turn Type		NA	Prot						Prot	Split	NA		
Protected Phases		2 10	2 10						3	12	12		
Permitted Phases													
Actuated Green, G (s)		116.6	116.6						7.6	11.4	11.4		
Effective Green, g (s)		116.6	116.6						7.6	11.4	11.4		
Actuated g/C Ratio		0.73	0.73						0.05	0.07	0.07		
Clearance Time (s)									6.0	6.0	6.0		
Vehicle Extension (s)									3.0	3.0	3.0		
Lane Grp Cap (vph)		5787	1295						134	150	158		
v/s Ratio Prot		c0.34	0.02						c0.02	c0.04	0.03		
v/s Ratio Perm													
v/c Ratio		0.47	0.03						0.46	0.57	0.46		
Uniform Delay, d ₁		8.9	6.0						74.2	71.9	71.4		
Progression Factor		1.02	0.99						1.00	1.00	1.00		
Incremental Delay, d ₂		0.1	0.0						2.4	4.8	2.1		
Delay (s)		9.2	6.0						76.6	76.7	73.5		
Level of Service		A	A						E	E	E		
Approach Delay (s)		9.1			0.0			76.6			75.2		
Approach LOS		A			A			E			E		
Intersection Summary													
HCM 2000 Control Delay			14.0									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.48										
Actuated Cycle Length (s)			160.0									Sum of lost time (s)	24.4
Intersection Capacity Utilization			89.6%									ICU Level of Service	E
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
 4046: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 Build - AM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	4172
Future Volume (vph)	0	0	0	0	0	4172
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Satd. Flow (prot)	2222	0	0	0	0	7941
Flt Permitted						
Satd. Flow (perm)	2222	0	0	0	0	7941
Link Speed (mph)	25		40			40
Link Distance (ft)	133		561			393
Travel Time (s)	3.6		9.6			6.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	4535
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.9%
ICU Level of Service	B
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Delays on the major and minor streets should be 0 seconds as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
 4946: NB M-1 [Woodward Ave] & Crossover/State Fair Gate #5

Project Panda
 2032 Build - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↑↑↑↑				
Traffic Volume (vph)	0	0	0	0	0	0	0	1141	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	1141	0	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	12	12
Satd. Flow (prot)	0	0	0	0	2222	0	0	7941	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	2222	0	0	7941	0	0	0	0
Link Speed (mph)		25			25			40				40
Link Distance (ft)		133			938			540				202
Travel Time (s)		3.6			25.6			9.2				3.4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	1240	0	0	0	0
Sign Control		Stop			Stop			Free				Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.9%
ICU Level of Service	B
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Delays on the major and minor streets should be 0 seconds as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

HCM Signalized Intersection Capacity Analysis
 1704: NB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]

Project Panda
 2032 Build - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↑↑↑		↔	↑↑					
Traffic Volume (vph)	0	0	0	0	178	507	506	638	0	0	0	0	
Future Volume (vph)	0	0	0	0	178	507	506	638	0	0	0	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	12	12	12	12	12	12	14	12	12	12	12	12	
Total Lost time (s)					5.7		5.5	5.5					
Lane Util. Factor					0.91		0.91	0.91					
Fr _t					0.89		1.00	1.00					
Fl _t Protected					1.00		0.95	0.99					
Satd. Flow (prot)					4758		1808	3537					
Fl _t Permitted					1.00		0.95	0.99					
Satd. Flow (perm)					4758		1808	3537					
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	0	193	551	550	693	0	0	0	0	
RTOR Reduction (vph)	0	0	0	0	211	0	122	21	0	0	0	0	
Lane Group Flow (vph)	0	0	0	0	533	0	279	821	0	0	0	0	
Turn Type					NA		Split	NA					
Protected Phases					6		5	5					
Permitted Phases													
Actuated Green, G (s)					17.3		51.5	51.5					
Effective Green, g (s)					17.3		51.5	51.5					
Actuated g/C Ratio					0.22		0.64	0.64					
Clearance Time (s)					5.7		5.5	5.5					
Lane Grp Cap (vph)					1028		1163	2276					
v/s Ratio Prot					c0.11		0.15	c0.23					
v/s Ratio Perm													
v/c Ratio					0.95dr		0.24	0.36					
Uniform Delay, d ₁					27.7		6.0	6.6					
Progression Factor					1.00		0.01	0.25					
Incremental Delay, d ₂					1.9		0.4	0.4					
Delay (s)					29.5		0.4	2.0					
Level of Service					C		A	A					
Approach Delay (s)		0.0			29.5			1.5			0.0		
Approach LOS		A			C			A			A		
Intersection Summary													
HCM 2000 Control Delay			12.0		HCM 2000 Level of Service				B				
HCM 2000 Volume to Capacity ratio			0.40										
Actuated Cycle Length (s)			80.0		Sum of lost time (s)				11.2				
Intersection Capacity Utilization			62.0%		ICU Level of Service				B				
Analysis Period (min)			15										
dr Defacto Right Lane. Recode with 1 though lane as a right lane.													
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
 1015: Crossover/Driveway & E 8 Mile Rd (WB)

Project Panda
 2032 Build - PM Peak Hour



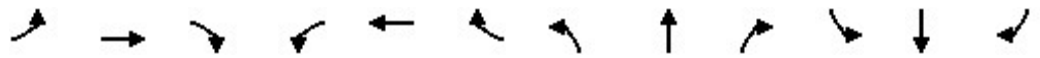
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔↔	↑↑↑		↔↔					↔
Traffic Volume (vph)	0	0	0	79	2931	4	388	0	0	0	0	12
Future Volume (vph)	0	0	0	79	2931	4	388	0	0	0	0	12
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	11	12	14	14	14	11	11	11
Total Lost time (s)				8.7	5.7		5.3					5.3
Lane Util. Factor				0.97	0.86		0.97					1.00
Flt				1.00	1.00		1.00					0.86
Flt Protected				0.95	1.00		0.95					1.00
Satd. Flow (prot)				3614	6519		3855					1640
Flt Permitted				0.95	1.00		0.95					1.00
Satd. Flow (perm)				3614	6519		3855					1640
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	86	3186	4	422	0	0	0	0	13
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	86	3190	0	422	0	0	0	0	13
Turn Type				Prot	NA		Prot					Perm
Protected Phases				2	1 2		4					
Permitted Phases												4
Actuated Green, G (s)				10.3	40.3		25.7					25.7
Effective Green, g (s)				10.3	40.3		25.7					25.7
Actuated g/C Ratio				0.13	0.50		0.32					0.32
Clearance Time (s)				8.7			5.3					5.3
Lane Grp Cap (vph)				465	3283		1238					526
v/s Ratio Prot				0.02	c0.49		c0.11					
v/s Ratio Perm												0.01
v/c Ratio				0.18	0.97		0.34					0.02
Uniform Delay, d1				31.1	19.3		20.7					18.6
Progression Factor				1.00	1.00		0.01					1.00
Incremental Delay, d2				0.9	10.4		0.5					0.1
Delay (s)				32.0	29.7		0.8					18.7
Level of Service				C	C		A					B
Approach Delay (s)		0.0			29.7			0.8			18.7	
Approach LOS		A			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	26.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	27.9
Intersection Capacity Utilization	101.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1904: SB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2032 Build - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑↑								↘	↙↑		
Traffic Volume (vph)	0	492	193	0	0	0	0	0	0	464	274	0	
Future Volume (vph)	0	492	193	0	0	0	0	0	0	464	274	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	11	11	11	12	12	12	12	12	12	16	14	14	
Total Lost time (s)		5.8								5.5	5.5		
Lane Util. Factor		0.91								0.91	0.91		
Frt		0.96								1.00	1.00		
Flt Protected		1.00								0.95	0.98		
Satd. Flow (prot)		4956								1921	3723		
Flt Permitted		1.00								0.95	0.98		
Satd. Flow (perm)		4956								1921	3723		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	535	210	0	0	0	0	0	0	504	298	0	
RTOR Reduction (vph)	0	88	0	0	0	0	0	0	0	17	17	0	
Lane Group Flow (vph)	0	657	0	0	0	0	0	0	0	245	523	0	
Turn Type		NA								Split	NA		
Protected Phases		12								11	11		
Permitted Phases													
Actuated Green, G (s)		18.2								50.5	50.5		
Effective Green, g (s)		18.2								50.5	50.5		
Actuated g/C Ratio		0.23								0.63	0.63		
Clearance Time (s)		5.8								5.5	5.5		
Lane Grp Cap (vph)		1127								1212	2350		
v/s Ratio Prot		c0.13								0.13	c0.14		
v/s Ratio Perm													
v/c Ratio		0.58								0.20	0.22		
Uniform Delay, d1		27.5								6.2	6.3		
Progression Factor		1.00								0.13	0.21		
Incremental Delay, d2		2.2								0.3	0.2		
Delay (s)		29.7								1.1	1.5		
Level of Service		C								A	A		
Approach Delay (s)		29.7			0.0			0.0			1.4		
Approach LOS		C			A			A			A		
Intersection Summary													
HCM 2000 Control Delay			15.0		HCM 2000 Level of Service						B		
HCM 2000 Volume to Capacity ratio			0.32										
Actuated Cycle Length (s)			80.0		Sum of lost time (s)						11.3		
Intersection Capacity Utilization			37.9%		ICU Level of Service						A		
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3945: NB M-1 [Woodward Ave] & Crossover/Site Driveway B

Project Panda
 2032 Build - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑	↗		↑↑↑↑				
Traffic Volume (vph)	0	0	0	0	73	87	0	4006	65	0	0	0
Future Volume (vph)	0	0	0	0	73	87	0	4006	65	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	16	16	16	12	12	12	12	12	12
Total Lost time (s)					9.0	9.0		5.7				
Lane Util. Factor					1.00	1.00		0.81				
Fr _t					1.00	0.85		1.00				
Fl _t Protected					1.00	1.00		1.00				
Satd. Flow (prot)					2222	1889		7922				
Fl _t Permitted					1.00	1.00		1.00				
Satd. Flow (perm)					2222	1889		7922				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	79	95	0	4354	71	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	22	0	3	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	79	73	0	4422	0	0	0	0
Turn Type					NA	Perm		NA				
Protected Phases					4			2				
Permitted Phases						4						
Actuated Green, G (s)					23.0	23.0		62.3				
Effective Green, g (s)					23.0	23.0		62.3				
Actuated g/C Ratio					0.23	0.23		0.62				
Clearance Time (s)					9.0	9.0		5.7				
Lane Grp Cap (vph)					511	434		4935				
v/s Ratio Prot					0.04			c0.56				
v/s Ratio Perm						c0.04						
v/c Ratio					0.15	0.17		0.90				
Uniform Delay, d ₁					30.7	30.8		16.1				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d ₂					0.6	0.8		3.0				
Delay (s)					31.4	31.7		19.0				
Level of Service					C	C		B				
Approach Delay (s)		0.0			31.5			19.0			0.0	
Approach LOS		A			C			B			A	
Intersection Summary												
HCM 2000 Control Delay			19.5		HCM 2000 Level of Service				B			
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			100.0		Sum of lost time (s)				14.7			
Intersection Capacity Utilization			62.3%		ICU Level of Service				B			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3045: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 Build - PM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶					↑↑↑↑
Traffic Volume (vph)	73	0	0	0	0	1695
Future Volume (vph)	73	0	0	0	0	1695
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	16	12	12	12	12	12
Total Lost time (s)	6.0					5.7
Lane Util. Factor	1.00					0.81
Frt	1.00					1.00
Flt Protected	0.95					1.00
Satd. Flow (prot)	2111					7941
Flt Permitted	0.95					1.00
Satd. Flow (perm)	2111					7941
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	79	0	0	0	0	1842
RTOR Reduction (vph)	14	0	0	0	0	0
Lane Group Flow (vph)	65	0	0	0	0	1842
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Actuated Green, G (s)	26.0					62.3
Effective Green, g (s)	26.0					62.3
Actuated g/C Ratio	0.26					0.62
Clearance Time (s)	6.0					5.7
Lane Grp Cap (vph)	548					4947
v/s Ratio Prot	c0.03					c0.23
v/s Ratio Perm						
v/c Ratio	0.12					0.37
Uniform Delay, d1	28.3					9.3
Progression Factor	0.01					1.00
Incremental Delay, d2	0.4					0.2
Delay (s)	0.6					9.5
Level of Service	A					A
Approach Delay (s)	0.6		0.0		9.5	
Approach LOS	A		A		A	

Intersection Summary			
HCM 2000 Control Delay	9.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.7
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2944: NB M-1 [Woodward Ave] & Crossover/W State Fair Ave

Project Panda
 2032 Build - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					←			↑↑↑↑					
Traffic Volume (vph)	0	0	0	0	132	181	0	3891	113	0	0	0	
Future Volume (vph)	0	0	0	0	132	181	0	3891	113	0	0	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	16	16	16	13	13	13	12	12	11	12	12	12	
Total Lost time (s)					8.8			5.2					
Lane Util. Factor					1.00			0.81					
Frbp, ped/bikes					0.99			1.00					
Flpb, ped/bikes					1.00			1.00					
Frt					0.92			1.00					
Flt Protected					1.00			1.00					
Satd. Flow (prot)					1825			7980					
Flt Permitted					1.00			1.00					
Satd. Flow (perm)					1825			7980					
Peak-hour factor, PHF	0.50	0.50	0.50	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	0	0	0	0	142	195	0	4096	119	0	0	0	
RTOR Reduction (vph)	0	0	0	0	0	0	0	4	0	0	0	0	
Lane Group Flow (vph)	0	0	0	0	337	0	0	4211	0	0	0	0	
Confl. Peds. (#/hr)	5						5		23	23			
Confl. Bikes (#/hr)									1				
Heavy Vehicles (%)	0%	0%	0%	1%	1%	5%	0%	1%	0%	0%	0%	0%	
Turn Type					NA			NA					
Protected Phases					4			2					
Permitted Phases													
Actuated Green, G (s)					28.2			77.8					
Effective Green, g (s)					28.2			77.8					
Actuated g/C Ratio					0.23			0.65					
Clearance Time (s)					8.8			5.2					
Lane Grp Cap (vph)					428			5173					
v/s Ratio Prot					c0.18			c0.53					
v/s Ratio Perm													
v/c Ratio					0.79			0.81					
Uniform Delay, d1					43.1			15.7					
Progression Factor					1.00			1.00					
Incremental Delay, d2					13.6			1.5					
Delay (s)					56.7			17.2					
Level of Service					E			B					
Approach Delay (s)		0.0			56.7			17.2			0.0		
Approach LOS		A			E			B			A		
Intersection Summary													
HCM 2000 Control Delay			20.1		HCM 2000 Level of Service				C				
HCM 2000 Volume to Capacity ratio			0.81										
Actuated Cycle Length (s)			120.0		Sum of lost time (s)				14.0				
Intersection Capacity Utilization			73.5%		ICU Level of Service				D				
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
 2044: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 Build - PM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶					↑↑↑↑
Traffic Volume (vph)	132	0	0	0	0	1767
Future Volume (vph)	132	0	0	0	0	1767
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	16	16	12	12	10	12
Total Lost time (s)	5.8					5.2
Lane Util. Factor	1.00					0.81
Frpb, ped/bikes	1.00					1.00
Flpb, ped/bikes	1.00					1.00
Frt	1.00					1.00
Flt Protected	0.95					1.00
Satd. Flow (prot)	2132					7941
Flt Permitted	0.95					1.00
Satd. Flow (perm)	2132					7941
Peak-hour factor, PHF	0.95	0.95	0.92	0.92	0.50	0.95
Adj. Flow (vph)	139	0	0	0	0	1860
RTOR Reduction (vph)	15	0	0	0	0	0
Lane Group Flow (vph)	124	0	0	0	0	1860
Confl. Peds. (#/hr)	5	5		23	23	
Heavy Vehicles (%)	1%	0%	0%	0%	0%	2%
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Actuated Green, G (s)	31.2					77.8
Effective Green, g (s)	31.2					77.8
Actuated g/C Ratio	0.26					0.65
Clearance Time (s)	5.8					5.2
Lane Grp Cap (vph)	554					5148
v/s Ratio Prot	c0.06					c0.23
v/s Ratio Perm						
v/c Ratio	0.22					0.36
Uniform Delay, d1	34.9					9.7
Progression Factor	0.00					1.00
Incremental Delay, d2	0.6					0.2
Delay (s)	0.6					9.9
Level of Service	A					A
Approach Delay (s)	0.6		0.0			9.9
Approach LOS	A		A			A
Intersection Summary						
HCM 2000 Control Delay			9.2		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.33			
Actuated Cycle Length (s)			120.0		Sum of lost time (s)	14.0
Intersection Capacity Utilization			73.5%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis
 9006: Ralston St/Site Driveway C & W State Fair Ave

Project Panda
 2032 Build - PM Peak Hour

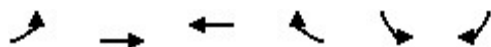


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	12	101	0	0	271	12	20	0	12	23	1	23
Future Volume (Veh/h)	12	101	0	0	271	12	20	0	12	23	1	23
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	110	0	0	295	13	22	0	13	25	1	25
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		771										
pX, platoon unblocked												
vC, conflicting volume	308			110			463	444	110	450	438	302
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	308			110			463	444	110	450	438	302
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			95	100	99	95	100	97
cM capacity (veh/h)	1253			1480			487	503	943	508	507	738
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	123	308	35	51								
Volume Left	13	0	22	25								
Volume Right	0	13	13	25								
cSH	1253	1700	594	599								
Volume to Capacity	0.01	0.18	0.06	0.09								
Queue Length 95th (ft)	1	0	5	7								
Control Delay (s)	0.9	0.0	11.4	11.6								
Lane LOS	A		B	B								
Approach Delay (s)	0.9	0.0	11.4	11.6								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			24.6%		ICU Level of Service				A			
Analysis Period (min)			15									

Used pseudo SBT volume of 1 to prevent fatal error from occurring in SimTraffic.

HCM Unsignalized Intersection Capacity Analysis
 9007: W State Fair Ave & Site Driveway D

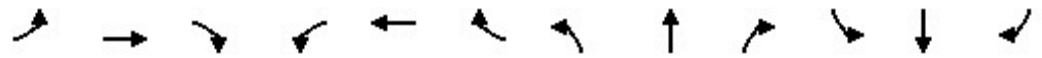
Project Panda
 2032 Build - PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↗		↘	↙
Traffic Volume (veh/h)	11	124	261	36	69	22
Future Volume (Veh/h)	11	124	261	36	69	22
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	135	284	39	75	24
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						9
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	323				462	304
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	323				462	304
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				86	97
cM capacity (veh/h)	1237				552	736
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	147	323	99			
Volume Left	12	0	75			
Volume Right	0	39	24			
cSH	1237	1700	729			
Volume to Capacity	0.01	0.19	0.14			
Queue Length 95th (ft)	1	0	12			
Control Delay (s)	0.7	0.0	11.9			
Lane LOS	A		B			
Approach Delay (s)	0.7	0.0	11.9			
Approach LOS			B			
Intersection Summary						
Average Delay			2.3			
Intersection Capacity Utilization			25.4%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis
1059: John R St & W State Fair Ave

Project Panda
2032 Build - PM Peak Hour



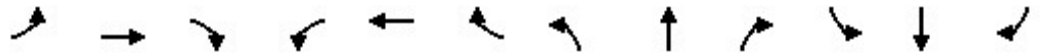
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	18	181	35	86	340	68	70	266	77	62	187	30	
Future Volume (vph)	18	181	35	86	340	68	70	266	77	62	187	30	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	10	11	11	10	12	12	10	12	12	10	12	12	
Total Lost time (s)	5.9	5.9		5.9	5.9		5.3	5.3		5.3	5.3		
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Frt	1.00	0.98		1.00	0.98		1.00	0.97		1.00	0.98		
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1542	1871		1773	1912		1612	1894		1772	1900		
Flt Permitted	0.37	1.00		0.61	1.00		0.60	1.00		0.45	1.00		
Satd. Flow (perm)	604	1871		1138	1912		1020	1894		836	1900		
Peak-hour factor, PHF	0.90	0.90	0.90	0.88	0.88	0.88	0.88	0.88	0.88	0.85	0.85	0.85	
Adj. Flow (vph)	20	201	39	98	386	77	80	302	88	73	220	35	
RTOR Reduction (vph)	0	14	0	0	14	0	0	21	0	0	12	0	
Lane Group Flow (vph)	20	226	0	98	449	0	80	369	0	73	243	0	
Confl. Peds. (#/hr)									1	1			
Heavy Vehicles (%)	15%	1%	0%	0%	2%	2%	10%	2%	0%	0%	2%	10%	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA		
Protected Phases		4			8			2			6		
Permitted Phases	4			8			2			6			
Actuated Green, G (s)	19.1	19.1		19.1	19.1		19.7	19.7		19.7	19.7		
Effective Green, g (s)	19.1	19.1		19.1	19.1		19.7	19.7		19.7	19.7		
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.39	0.39		0.39	0.39		
Clearance Time (s)	5.9	5.9		5.9	5.9		5.3	5.3		5.3	5.3		
Lane Grp Cap (vph)	230	714		434	730		401	746		329	748		
v/s Ratio Prot		0.12			c0.23			c0.19			0.13		
v/s Ratio Perm	0.03			0.09			0.08			0.09			
v/c Ratio	0.09	0.32		0.23	0.61		0.20	0.49		0.22	0.33		
Uniform Delay, d1	9.9	10.9		10.4	12.5		10.0	11.4		10.1	10.5		
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	0.7	1.2		1.2	3.8		1.1	2.3		1.6	1.2		
Delay (s)	10.6	12.0		11.7	16.3		11.1	13.7		11.6	11.7		
Level of Service	B	B		B	B		B	B		B	B		
Approach Delay (s)		11.9			15.5			13.3			11.7		
Approach LOS		B			B			B			B		
Intersection Summary													
HCM 2000 Control Delay			13.5									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.55										
Actuated Cycle Length (s)			50.0									Sum of lost time (s)	11.2
Intersection Capacity Utilization			71.5%									ICU Level of Service	C
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

Project Panda

1404: SB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]/WB M-102 [8 Mile Srv Rd]



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↙	↕						↕	↘
Traffic Volume (vph)	0	0	0	208	476	0	0	0	0	0	530	311
Future Volume (vph)	0	0	0	208	476	0	0	0	0	0	530	311
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	14	12	14	9	12	12	12	12	12	11	13
Total Lost time (s)				5.6	5.6							5.7
Lane Util. Factor				0.91	0.91							0.91
Flt				1.00	1.00							0.94
Flt Protected				0.95	1.00							1.00
Satd. Flow (prot)				1808	3205							4887
Flt Permitted				0.95	1.00							1.00
Satd. Flow (perm)				1808	3205							4887
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	226	517	0	0	0	0	0	576	338
RTOR Reduction (vph)	0	0	0	14	14	0	0	0	0	0	132	0
Lane Group Flow (vph)	0	0	0	189	526	0	0	0	0	0	782	0
Turn Type				Split	NA							NA
Protected Phases				10	10							9
Permitted Phases												
Actuated Green, G (s)				50.4	50.4							18.3
Effective Green, g (s)				50.4	50.4							18.3
Actuated g/C Ratio				0.63	0.63							0.23
Clearance Time (s)				5.6	5.6							5.7
Lane Grp Cap (vph)				1139	2019							1117
v/s Ratio Prot				0.10	c0.16							c0.16
v/s Ratio Perm												
v/c Ratio				0.17	0.26							0.70
Uniform Delay, d1				6.1	6.6							28.3
Progression Factor				0.78	0.78							1.00
Incremental Delay, d2				0.3	0.3							3.7
Delay (s)				5.1	5.4							32.0
Level of Service				A	A							C
Approach Delay (s)		0.0			5.3			0.0				32.0
Approach LOS		A			A			A				C
Intersection Summary												
HCM 2000 Control Delay			20.0		HCM 2000 Level of Service						C	
HCM 2000 Volume to Capacity ratio			0.38									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)			11.3				
Intersection Capacity Utilization			37.9%		ICU Level of Service			A				
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1804: NB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2032 Build - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	428	528	0	0	0	0	0	717	170	0	0	0
Future Volume (vph)	428	528	0	0	0	0	0	717	170	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	14	9	9	12	12	12	11	11	11	12	12	12
Total Lost time (s)	5.4	5.4						5.7				
Lane Util. Factor	0.91	0.91						0.91				
Frt	1.00	1.00						0.97				
Flt Protected	0.95	0.99						1.00				
Satd. Flow (prot)	1808	3183						5026				
Flt Permitted	0.95	0.99						1.00				
Satd. Flow (perm)	1808	3183						5026				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	465	574	0	0	0	0	0	779	185	0	0	0
RTOR Reduction (vph)	14	14	0	0	0	0	0	49	0	0	0	0
Lane Group Flow (vph)	325	686	0	0	0	0	0	915	0	0	0	0
Turn Type	Split	NA						NA				
Protected Phases	2	2						1				
Permitted Phases												
Actuated Green, G (s)	50.6	50.6						18.3				
Effective Green, g (s)	50.6	50.6						18.3				
Actuated g/C Ratio	0.63	0.63						0.23				
Clearance Time (s)	5.4	5.4						5.7				
Lane Grp Cap (vph)	1143	2013						1149				
v/s Ratio Prot	0.18	c0.22						c0.18				
v/s Ratio Perm												
v/c Ratio	0.28	0.34						0.80				
Uniform Delay, d1	6.6	6.9						29.1				
Progression Factor	0.51	0.51						1.00				
Incremental Delay, d2	0.6	0.4						5.8				
Delay (s)	3.9	3.9						34.8				
Level of Service	A	A						C				
Approach Delay (s)		3.9			0.0			34.8			0.0	
Approach LOS		A			A			C			A	
Intersection Summary												
HCM 2000 Control Delay			18.8					HCM 2000 Level of Service			B	
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			80.0					Sum of lost time (s)		11.2		
Intersection Capacity Utilization			55.4%					ICU Level of Service		B		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2915: Market Place Dr/Crossover & EB M-102 [8 Mile Rd]

Project Panda
 2032 Build - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑↑↑	↗						↖↖	↘	↑		
Traffic Volume (vph)	0	2929	119	0	0	0	0	0	210	72	115	0	
Future Volume (vph)	0	2929	119	0	0	0	0	0	210	72	115	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	12	12	14	12	12	12	12	12	11	16	16	16	
Total Lost time (s)		6.2	6.2						6.0	6.0	6.0		
Lane Util. Factor		0.81	1.00						0.88	1.00	1.00		
Frt		1.00	0.85						0.85	1.00	1.00		
Flt Protected		1.00	1.00						1.00	0.95	1.00		
Satd. Flow (prot)		7941	1778						2836	2111	2222		
Flt Permitted		1.00	1.00						1.00	0.95	1.00		
Satd. Flow (perm)		7941	1778						2836	2111	2222		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	3184	129	0	0	0	0	0	228	78	125	0	
RTOR Reduction (vph)	0	0	41	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	3184	88	0	0	0	0	0	228	78	125	0	
Turn Type		NA	Prot						Prot	Split	NA		
Protected Phases		2 10	2 10						3	12	12		
Permitted Phases													
Actuated Green, G (s)		108.8	108.8						14.0	12.8	12.8		
Effective Green, g (s)		108.8	108.8						14.0	12.8	12.8		
Actuated g/C Ratio		0.68	0.68						0.09	0.08	0.08		
Clearance Time (s)									6.0	6.0	6.0		
Vehicle Extension (s)									3.0	3.0	3.0		
Lane Grp Cap (vph)		5399	1209						248	168	177		
v/s Ratio Prot		c0.40	0.05						c0.08	0.04	c0.06		
v/s Ratio Perm													
v/c Ratio		0.59	0.07						0.92	0.46	0.71		
Uniform Delay, d1		13.7	8.6						72.4	70.3	71.8		
Progression Factor		0.98	1.21						1.00	1.00	1.00		
Incremental Delay, d2		0.2	0.0						35.7	2.0	12.1		
Delay (s)		13.5	10.5						108.1	72.3	83.9		
Level of Service		B	B						F	E	F		
Approach Delay (s)		13.4			0.0			108.1			79.4		
Approach LOS		B			A			F			E		
Intersection Summary													
HCM 2000 Control Delay			22.8									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.63										
Actuated Cycle Length (s)			160.0									Sum of lost time (s)	24.4
Intersection Capacity Utilization			93.5%									ICU Level of Service	F
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
 4046: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 Build - PM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	1695
Future Volume (vph)	0	0	0	0	0	1695
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Satd. Flow (prot)	2222	0	0	0	0	7941
Flt Permitted						
Satd. Flow (perm)	2222	0	0	0	0	7941
Link Speed (mph)	25		40			40
Link Distance (ft)	107		492			325
Travel Time (s)	2.9		8.4			5.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	1842
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.1%
ICU Level of Service	B
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Delays on the major and minor streets should be 0 seconds as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
 4946: NB M-1 [Woodward Ave] & Crossover/State Fair Gate #5

Project Panda
 2032 Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↑↑↑↑↔				
Traffic Volume (vph)	0	0	0	0	0	0	0	4093	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	4093	0	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	12	12
Satd. Flow (prot)	0	0	0	0	2222	0	0	7941	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	2222	0	0	7941	0	0	0	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		107			965			473			267	
Travel Time (s)		2.9			26.3			8.1			4.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	4449	0	0	0	0
Sign Control		Stop			Stop			Free			Free	
























Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.1%
ICU Level of Service	B
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Delays on the major and minor streets should be 0 seconds as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
 1915: Site Driveway A/Crossover & 8 Mile Srv Rd (EB)

Project Panda
 2032 Build - AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	    									 	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	14	12	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	325		275	0		0	0		0	0		0
Storage Lanes	2		0	0		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			No
Link Speed (mph)		40			40			25				25
Link Distance (ft)		677			2304			386				96
Travel Time (s)		11.5			39.3			10.5				2.6
Lane Group Flow (vph)	158	2698	0	0	0	0	0	30	63	0	171	0
v/c Ratio	0.38	0.66						0.16	0.16		0.26	
Control Delay	38.0	11.3						35.2	0.8		0.9	
Queue Delay	0.0	0.0						0.0	0.0		0.0	
Total Delay	38.0	11.3						35.2	0.8		0.9	
Queue Length 50th (ft)	32	230						14	0		0	
Queue Length 95th (ft)	54	89						39	0		0	
Internal Link Dist (ft)		597			2224			306			16	
Turn Bay Length (ft)	325											
Base Capacity (vph)	419	4076						191	405		665	
Starvation Cap Reductn	0	0						0	0		0	
Spillback Cap Reductn	0	0						0	0		0	
Storage Cap Reductn	0	0						0	0		0	
Reduced v/c Ratio	0.38	0.66						0.16	0.16		0.26	
Intersection Summary												
Area Type:	Other											

Lanes, Volumes, Timings
1015: Crossover/Driveway & E 8 Mile Rd (WB)

Project Panda
2032 Build - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	11	12	14	14	14	11	11	11
Storage Length (ft)	0		0	150		0	0		0	0		0
Storage Lanes	0		0	2		0	2		0	0		1
Taper Length (ft)	25			100			25			25		
Right Turn on Red			Yes			Yes			Yes			No
Link Speed (mph)		40			40			25				25
Link Distance (ft)		682			2329			96				286
Travel Time (s)		11.6			39.7			2.6				7.8
Lane Group Flow (vph)	0	0	0	171	3567	0	188	0	0	0	0	4
v/c Ratio				0.34	0.99		0.16					0.01
Control Delay				33.0	31.2		0.7					19.2
Queue Delay				0.0	0.0		0.0					0.0
Total Delay				33.0	31.2		0.7					19.2
Queue Length 50th (ft)				40	473		0					1
Queue Length 95th (ft)				69	#615		0					8
Internal Link Dist (ft)		602			2249			16				206
Turn Bay Length (ft)				150								
Base Capacity (vph)				510	3607		1190					506
Starvation Cap Reductn				0	0		0					0
Spillback Cap Reductn				0	0		0					0
Storage Cap Reductn				0	0		0					0
Reduced v/c Ratio				0.34	0.99		0.16					0.01

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
 1704: NB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]

Project Panda
 2032 Build - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↑	↑↑				
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	12	12	14	12	12	12	12	12
Storage Length (ft)	0		0	875		0	90		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		174			1335			234				818
Travel Time (s)		3.0			22.8			4.0				13.9
Lane Group Flow (vph)	0	0	0	0	697	0	292	614	0	0	0	0
v/c Ratio					0.52		0.23	0.27				
Control Delay					14.0		0.6	2.6				
Queue Delay					0.0		0.6	0.5				
Total Delay					14.0		1.2	3.1				
Queue Length 50th (ft)					50		2	31				
Queue Length 95th (ft)					84		4	36				
Internal Link Dist (ft)		94			1255			154				738
Turn Bay Length (ft)							90					
Base Capacity (vph)					1335		1253	2296				
Starvation Cap Reductn					0		611	1171				
Spillback Cap Reductn					0		0	0				
Storage Cap Reductn					0		0	0				
Reduced v/c Ratio					0.52		0.45	0.55				
Intersection Summary												
Area Type:	Other											

Lanes, Volumes, Timings
 1904: SB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2032 Build - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑								↘	↙↑	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	11	11	11	12	12	12	12	12	12	16	14	14
Storage Length (ft)	0		900	0		0	0		0	90		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		1309			166			808				245
Travel Time (s)		22.3			2.8			13.8				4.2
Lane Group Flow (vph)	0	752	0	0	0	0	0	0	0	242	502	0
v/c Ratio		0.59								0.19	0.21	
Control Delay		21.9								0.6	1.3	
Queue Delay		0.0								0.7	0.4	
Total Delay		21.9								1.3	1.7	
Queue Length 50th (ft)		87								1	9	
Queue Length 95th (ft)		127								2	11	
Internal Link Dist (ft)		1229			86			728				165
Turn Bay Length (ft)										90		
Base Capacity (vph)		1264								1243	2387	
Starvation Cap Reductn		0								711	1362	
Spillback Cap Reductn		0								0	0	
Storage Cap Reductn		0								0	0	
Reduced v/c Ratio		0.59								0.45	0.49	

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 3945: NB M-1 [Woodward Ave] & Crossover/Site Driveway B

Project Panda
 2032 Build - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑	↗		↑↑↑↑				
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	16	16	16	12	12	12	12	12	12
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		30			25			40				40
Link Distance (ft)		98			1019			383				540
Travel Time (s)		2.2			27.8			6.5				9.2
Lane Group Flow (vph)	0	0	0	0	42	49	0	1290	0	0	0	0
v/c Ratio					0.07	0.09		0.28				
Control Delay					26.0	8.4		9.3				
Queue Delay					0.0	0.0		0.0				
Total Delay					26.0	8.4		9.3				
Queue Length 50th (ft)					18	0		80				
Queue Length 95th (ft)					43	27		97				
Internal Link Dist (ft)		18			939			303				460
Turn Bay Length (ft)												
Base Capacity (vph)					567	519		4576				
Starvation Cap Reductn					0	0		0				
Spillback Cap Reductn					0	0		0				
Storage Cap Reductn					0	0		0				
Reduced v/c Ratio					0.07	0.09		0.28				

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 3045: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 Build - AM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Right Turn on Red	Yes	Yes		Yes		
Link Speed (mph)	25		40			40
Link Distance (ft)	98		813			561
Travel Time (s)	2.7		13.9			9.6
Lane Group Flow (vph)	42	0	0	0	0	4535
v/c Ratio	0.07					0.98
Control Delay	0.3					28.9
Queue Delay	0.0					0.0
Total Delay	0.3					28.9
Queue Length 50th (ft)	0					575
Queue Length 95th (ft)	0					#664
Internal Link Dist (ft)	18		733			481
Turn Bay Length (ft)						
Base Capacity (vph)	609					4614
Starvation Cap Reductn	0					0
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.07					0.98

Intersection Summary

Area Type: Other
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
 2944: NB M-1 [Woodward Ave] & Crossover/W State Fair Ave

Project Panda
 2032 Build - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	16	16	13	13	13	12	12	11	12	12	12
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		25			25			40				40
Link Distance (ft)		76			457			1032				459
Travel Time (s)		2.1			12.5			17.6				7.8
Lane Group Flow (vph)	0	0	0	0	308	0	0	1215	0	0	0	0
v/c Ratio					0.64			0.24				
Control Delay					39.5			8.6				
Queue Delay					0.0			0.0				
Total Delay					39.5			8.6				
Queue Length 50th (ft)					172			85				
Queue Length 95th (ft)					271			100				
Internal Link Dist (ft)		1			377			952				379
Turn Bay Length (ft)												
Base Capacity (vph)					478			4976				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			0				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.64			0.24				

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 2044: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 Build - AM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	16	12	12	10	12
Storage Length (ft)	30	0		0	0	
Storage Lanes	0	0		0	0	
Taper Length (ft)	25				25	
Right Turn on Red	Yes	Yes		Yes		
Link Speed (mph)	25		40			40
Link Distance (ft)	76		1017			813
Travel Time (s)	2.1		17.3			13.9
Lane Group Flow (vph)	117	0	0	0	0	4433
v/c Ratio	0.21					0.85
Control Delay	7.2					18.8
Queue Delay	0.0					0.6
Total Delay	7.2					19.4
Queue Length 50th (ft)	14					616
Queue Length 95th (ft)	m16					646
Internal Link Dist (ft)	1		937			733
Turn Bay Length (ft)	30					
Base Capacity (vph)	559					5199
Starvation Cap Reductn	0					362
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.21					0.92

Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.

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	24	79	0	0	255	24	15	0	11	10	1	8
Future Vol, veh/h	24	79	0	0	255	24	15	0	11	10	1	8
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	26	86	0	0	277	26	16	0	12	11	1	9

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	303	0	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	-
Pot Cap-1 Maneuver	1258	-	0	0
Stage 1	-	-	0	0
Stage 2	-	-	0	0
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1258	-	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.8	0	10.8	11.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	645	1258	-	-	-	594
HCM Lane V/C Ratio	0.044	0.021	-	-	-	0.035
HCM Control Delay (s)	10.8	7.9	0	-	-	11.3
HCM Lane LOS	B	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0.1	-	-	-	0.1

Used pseudo SBT volume of 1 to prevent fatal error from occurring in SimTraffic.

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	24	75	270	71	26	9
Future Vol, veh/h	24	75	270	71	26	9
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	225
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	26	82	293	77	28	10





















Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	370	0	-	0	466 332
Stage 1	-	-	-	-	332 -
Stage 2	-	-	-	-	134 -
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	1189	-	-	-	555 710
Stage 1	-	-	-	-	727 -
Stage 2	-	-	-	-	892 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1189	-	-	-	542 710
Mov Cap-2 Maneuver	-	-	-	-	542 -
Stage 1	-	-	-	-	710 -
Stage 2	-	-	-	-	892 -

Approach	EB	WB	SB
HCM Control Delay, s	2	0	11.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1189	-	-	-	542	710
HCM Lane V/C Ratio	0.022	-	-	-	0.052	0.014
HCM Control Delay (s)	8.1	0	-	-	12	10.1
HCM Lane LOS	A	A	-	-	B	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2	0

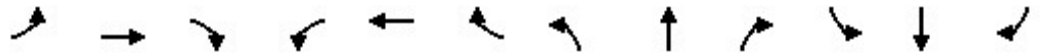
Lanes, Volumes, Timings
1059: John R St & W State Fair Ave

Project Panda
2032 Build - AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	10	11	11	10	12	12	10	12	12	10	12	12
Storage Length (ft)	50		0	50		0	70		0	70		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1146			1401			1021			1264	
Travel Time (s)		26.0			31.8			23.2			28.7	
Lane Group Flow (vph)	11	94	0	37	299	0	42	115	0	15	142	0
v/c Ratio	0.04	0.14		0.07	0.41		0.09	0.15		0.03	0.20	
Control Delay	10.2	9.5		10.4	12.9		10.3	8.8		9.6	10.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.2	9.5		10.4	12.9		10.3	8.8		9.6	10.1	
Queue Length 50th (ft)	2	15		7	58		7	16		3	24	
Queue Length 95th (ft)	9	34		17	87		22	40		11	50	
Internal Link Dist (ft)		1066			1321			941			1184	
Turn Bay Length (ft)	50			50			70			70		
Base Capacity (vph)	313	695		496	732		448	748		460	705	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.04	0.14		0.07	0.41		0.09	0.15		0.03	0.20	
Intersection Summary												
Area Type:	Other											

Lanes, Volumes, Timings

1404: SB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]/WB M-102 [8 Mile Srv Rd]



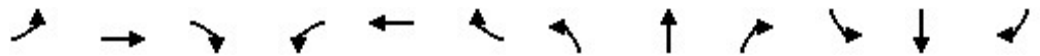
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	14	12	14	9	12	12	12	12	12	11	13
Storage Length (ft)	0		0	110		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		1243			174			245				469
Travel Time (s)		21.2			3.0			4.2				8.0
Lane Group Flow (vph)	0	0	0	198	415	0	0	0	0	0	796	0
v/c Ratio				0.17	0.20							0.64
Control Delay				5.1	6.2							24.5
Queue Delay				1.4	0.9							0.0
Total Delay				6.5	7.1							24.5
Queue Length 50th (ft)				29	39							103
Queue Length 95th (ft)				63	64							144
Internal Link Dist (ft)		1163			94			165				389
Turn Bay Length (ft)				110								
Base Capacity (vph)				1159	2029							1247
Starvation Cap Reductn				777	1299							0
Spillback Cap Reductn				0	0							0
Storage Cap Reductn				0	0							0
Reduced v/c Ratio				0.52	0.57							0.64

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 1804: NB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2032 Build - AM Peak Hour



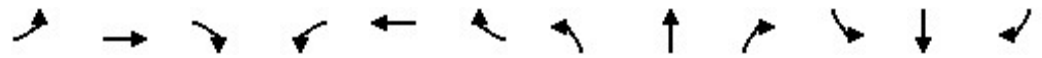
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	14	9	9	12	12	12	11	11	11	12	12	12
Storage Length (ft)	110		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		166			939			1294				234
Travel Time (s)		2.8			16.0			22.1				4.0
Lane Group Flow (vph)	284	588	0	0	0	0	0	709	0	0	0	0
v/c Ratio	0.24	0.29						0.58				
Control Delay	2.9	3.4						24.5				
Queue Delay	1.5	0.9						0.0				
Total Delay	4.3	4.3						24.5				
Queue Length 50th (ft)	18	26						94				
Queue Length 95th (ft)	46	47						132				
Internal Link Dist (ft)		86			859			1214				154
Turn Bay Length (ft)	110											
Base Capacity (vph)	1165	2030						1227				
Starvation Cap Reductn	685	1098						0				
Spillback Cap Reductn	0	0						0				
Storage Cap Reductn	0	0						0				
Reduced v/c Ratio	0.59	0.63						0.58				

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 2915: Market Place Dr/Crossover & EB M-102 [8 Mile Rd]

Project Panda
 2032 Build - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑	↗						↖↖	↘	↑	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	14	12	12	12	12	12	11	16	16	16
Storage Length (ft)	0		280	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		2	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			No	No		Yes
Link Speed (mph)		40			40			25				40
Link Distance (ft)		349			677			533				92
Travel Time (s)		5.9			11.5			14.5				1.6
Lane Group Flow (vph)	0	2710	60	0	0	0	0	0	61	85	73	0
v/c Ratio		0.46	0.04						0.38	0.57	0.46	
Control Delay		5.0	0.9						79.4	86.1	80.3	
Queue Delay		0.0	0.0						0.0	0.0	0.0	
Total Delay		5.0	0.9						79.4	86.1	80.3	
Queue Length 50th (ft)		140	1						35	87	75	
Queue Length 95th (ft)		156	m6						64	147	130	
Internal Link Dist (ft)		269			597			453				12
Turn Bay Length (ft)			280									
Base Capacity (vph)		6035	1366						248	184	194	
Starvation Cap Reductn		0	0						0	0	0	
Spillback Cap Reductn		0	0						0	0	0	
Storage Cap Reductn		0	0						0	0	0	
Reduced v/c Ratio		0.45	0.04						0.25	0.46	0.38	

Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	16	12	12	12
Storage Length (ft)		0	230		0	0
Storage Lanes		0	2		0	0
Taper Length (ft)			25		25	
Link Speed (mph)	40			40	40	
Link Distance (ft)	311			682	92	
Travel Time (s)	5.3			11.6	1.6	
Lane Group Flow (vph)	0	0	158	3588	0	0

Intersection Summary

Area Type:	Other
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Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	4172
Future Volume (vph)	0	0	0	0	0	4172
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Satd. Flow (prot)	2222	0	0	0	0	7941
Flt Permitted						
Satd. Flow (perm)	2222	0	0	0	0	7941
Link Speed (mph)	25		40			40
Link Distance (ft)	133		561			393
Travel Time (s)	3.6		9.6			6.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	4535
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.9%
ICU Level of Service	B
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Queues on the major and minor streets should be 0 FT as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
 4946: NB M-1 [Woodward Ave] & Crossover/State Fair Gate #5

Project Panda
 2032 Build - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↑↑↑↑				
Traffic Volume (vph)	0	0	0	0	0	0	0	1141	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	1141	0	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	12	12
Satd. Flow (prot)	0	0	0	0	2222	0	0	7941	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	2222	0	0	7941	0	0	0	0
Link Speed (mph)		25			25			40				40
Link Distance (ft)		133			938			540				202
Travel Time (s)		3.6			25.6			9.2				3.4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	1240	0	0	0	0
Sign Control		Stop			Stop			Free				Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.9%
ICU Level of Service	B
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Queues on the major and minor streets should be 0 FT as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
 1915: Site Driveway A/Crossover & 8 Mile Srv Rd (EB)

Project Panda
 2032 Build - PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	14	12	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	325		275	0		0	0		0	0		0
Storage Lanes	2		0	0		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			No
Link Speed (mph)		40			40			25				25
Link Distance (ft)		680			2304			449				96
Travel Time (s)		11.6			39.3			12.2				2.6
Lane Group Flow (vph)	341	3148	0	0	0	0	0	80	164	0	86	0
v/c Ratio	0.81	0.77						0.37	0.39		0.14	
Control Delay	42.3	14.2						38.5	2.9		0.5	
Queue Delay	0.0	0.0						0.0	0.0		0.0	
Total Delay	42.3	14.2						38.5	2.9		0.5	
Queue Length 50th (ft)	88	344						38	0		0	
Queue Length 95th (ft)	m#128	357						79	3		0	
Internal Link Dist (ft)		600			2224			369			16	
Turn Bay Length (ft)	325											
Base Capacity (vph)	419	4088						215	422		619	
Starvation Cap Reductn	0	0						0	0		0	
Spillback Cap Reductn	0	0						0	0		0	
Storage Cap Reductn	0	0						0	0		0	
Reduced v/c Ratio	0.81	0.77						0.37	0.39		0.14	

Intersection Summary

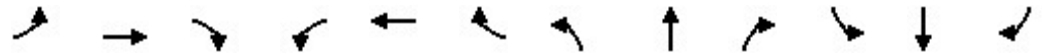
Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
 1015: Crossover/Driveway & E 8 Mile Rd (WB)

Project Panda
 2032 Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	11	12	14	14	14	11	11	11
Storage Length (ft)	0		0	150		0	0		0	0		0
Storage Lanes	0		0	2		0	2		0	0		1
Taper Length (ft)	25			100			25			25		
Right Turn on Red			Yes			Yes			Yes			No
Link Speed (mph)		40			40			25				25
Link Distance (ft)		682			2329			96				286
Travel Time (s)		11.6			39.7			2.6				7.8
Lane Group Flow (vph)	0	0	0	86	3190	0	422	0	0	0	0	13
v/c Ratio				0.18	0.90		0.34					0.02
Control Delay				32.3	21.4		0.8					18.8
Queue Delay				0.0	0.0		0.0					0.0
Total Delay				32.3	21.4		0.8					18.8
Queue Length 50th (ft)				20	387		0					4
Queue Length 95th (ft)				40	449		m0					17
Internal Link Dist (ft)		602			2249			16				206
Turn Bay Length (ft)				150								
Base Capacity (vph)				465	3528		1238					526
Starvation Cap Reductn				0	0		0					0
Spillback Cap Reductn				0	0		0					0
Storage Cap Reductn				0	0		0					0
Reduced v/c Ratio				0.18	0.90		0.34					0.02

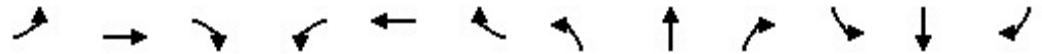
Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
 1704: NB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]

Project Panda
 2032 Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↑	↑↑				
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	12	12	14	12	12	12	12	12
Storage Length (ft)	0		0	875		0	90		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		174			1335			234				818
Travel Time (s)		3.0			22.8			4.0				13.9
Lane Group Flow (vph)	0	0	0	0	744	0	401	842	0	0	0	0
v/c Ratio					0.95dr		0.31	0.37				
Control Delay					20.0		0.5	1.9				
Queue Delay					0.0		0.8	0.9				
Total Delay					20.0		1.3	2.8				
Queue Length 50th (ft)					76		1	26				
Queue Length 95th (ft)					115		m0	34				
Internal Link Dist (ft)		94			1255			154				738
Turn Bay Length (ft)							90					
Base Capacity (vph)					1239		1286	2298				
Starvation Cap Reductn					0		577	1091				
Spillback Cap Reductn					0		1	1				
Storage Cap Reductn					0		0	0				
Reduced v/c Ratio					0.60		0.57	0.70				

Intersection Summary

Area Type: Other
 m Volume for 95th percentile queue is metered by upstream signal.
 dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lanes, Volumes, Timings
 1904: SB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2032 Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑								↘	↙↑	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	11	11	11	12	12	12	12	12	12	16	14	14
Storage Length (ft)	0		900	0		0	0		0	90		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		1292			166			808				245
Travel Time (s)		22.0			2.8			13.8				4.2
Lane Group Flow (vph)	0	745	0	0	0	0	0	0	0	262	540	0
v/c Ratio		0.61								0.21	0.23	
Control Delay		25.8								1.0	1.4	
Queue Delay		0.0								1.0	0.6	
Total Delay		25.8								2.0	2.0	
Queue Length 50th (ft)		103								5	10	
Queue Length 95th (ft)		142								m9	14	
Internal Link Dist (ft)		1212			86			728				165
Turn Bay Length (ft)										90		
Base Capacity (vph)		1215								1229	2367	
Starvation Cap Reductn		0								714	1366	
Spillback Cap Reductn		0								0	0	
Storage Cap Reductn		0								0	0	
Reduced v/c Ratio		0.61								0.51	0.54	

Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
 3945: NB M-1 [Woodward Ave] & Crossover/Site Driveway B

Project Panda
 2032 Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑	↗		↑↑↑↑				
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	16	16	16	12	12	12	12	12	12
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		30			25			40				40
Link Distance (ft)		98			1019			451				473
Travel Time (s)		2.2			27.8			7.7				8.1
Lane Group Flow (vph)	0	0	0	0	79	95	0	4425	0	0	0	0
v/c Ratio					0.15	0.21		0.90				
Control Delay					31.8	23.4		19.3				
Queue Delay					0.0	0.0		0.0				
Total Delay					31.8	23.4		19.3				
Queue Length 50th (ft)					40	34		543				
Queue Length 95th (ft)					79	76		587				
Internal Link Dist (ft)		18			939			371				393
Turn Bay Length (ft)												
Base Capacity (vph)					511	456		4939				
Starvation Cap Reductn					0	0		0				
Spillback Cap Reductn					0	0		0				
Storage Cap Reductn					0	0		0				
Reduced v/c Ratio					0.15	0.21		0.90				

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 3045: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 Build - PM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Right Turn on Red	Yes	Yes		Yes		
Link Speed (mph)	25		40			40
Link Distance (ft)	98		411			492
Travel Time (s)	2.7		7.0			8.4
Lane Group Flow (vph)	79	0	0	0	0	1842
v/c Ratio	0.14					0.37
Control Delay	0.6					9.5
Queue Delay	0.0					0.0
Total Delay	0.6					9.5
Queue Length 50th (ft)	0					130
Queue Length 95th (ft)	0					149
Internal Link Dist (ft)	18		331			412
Turn Bay Length (ft)						
Base Capacity (vph)	562					4947
Starvation Cap Reductn	0					0
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.14					0.37

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 2944: NB M-1 [Woodward Ave] & Crossover/W State Fair Ave

Project Panda
 2032 Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	16	16	13	13	13	12	12	11	12	12	12
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		25			25			40				40
Link Distance (ft)		76			415			1032				391
Travel Time (s)		2.1			11.3			17.6				6.7
Lane Group Flow (vph)	0	0	0	0	337	0	0	4215	0	0	0	0
v/c Ratio					0.79			0.81				
Control Delay					57.5			17.4				
Queue Delay					0.0			0.0				
Total Delay					57.5			17.4				
Queue Length 50th (ft)					246			553				
Queue Length 95th (ft)					#383			583				
Internal Link Dist (ft)		1			335			952				311
Turn Bay Length (ft)												
Base Capacity (vph)					428			5178				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			0				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.79			0.81				

Intersection Summary

Area Type: Other
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
 2044: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 Build - PM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	16	12	12	10	12
Storage Length (ft)	30	0		0	0	
Storage Lanes	0	0		0	0	
Taper Length (ft)	25				25	
Right Turn on Red	Yes	Yes		Yes		
Link Speed (mph)	25		40			40
Link Distance (ft)	76		1017			403
Travel Time (s)	2.1		17.3			6.9
Lane Group Flow (vph)	139	0	0	0	0	1860
v/c Ratio	0.24					0.36
Control Delay	0.6					9.9
Queue Delay	0.0					0.0
Total Delay	0.6					9.9
Queue Length 50th (ft)	0					151
Queue Length 95th (ft)	m0					168
Internal Link Dist (ft)	1		937			323
Turn Bay Length (ft)	30					
Base Capacity (vph)	569					5148
Starvation Cap Reductn	0					0
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.24					0.36

Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	12	101	0	0	271	12	20	0	12	23	1	23
Future Vol, veh/h	12	101	0	0	271	12	20	0	12	23	1	23
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	110	0	0	295	13	22	0	13	25	1	25

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	308	0	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	-
Pot Cap-1 Maneuver	1253	-	0	0
Stage 1	-	-	0	0
Stage 2	-	-	0	0
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1253	-	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0	11.3	11.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	603	1253	-	-	-	601
HCM Lane V/C Ratio	0.058	0.01	-	-	-	0.085
HCM Control Delay (s)	11.3	7.9	0	-	-	11.5
HCM Lane LOS	B	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	-	0.3

Used pseudo SBT volume of 1 to prevent fatal error from occurring in SimTraffic.

Intersection						
Int Delay, s/veh	2.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	11	124	261	36	69	22
Future Vol, veh/h	11	124	261	36	69	22
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	225
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	12	135	284	39	75	24





















Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	323	0	0	463	304
Stage 1	-	-	-	304	-
Stage 2	-	-	-	159	-
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	1237	-	-	557	736
Stage 1	-	-	-	748	-
Stage 2	-	-	-	870	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1237	-	-	551	736
Mov Cap-2 Maneuver	-	-	-	551	-
Stage 1	-	-	-	741	-
Stage 2	-	-	-	870	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	12
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1237	-	-	-	551	736
HCM Lane V/C Ratio	0.01	-	-	-	0.136	0.032
HCM Control Delay (s)	7.9	0	-	-	12.6	10.1
HCM Lane LOS	A	A	-	-	B	B
HCM 95th %tile Q(veh)	0	-	-	-	0.5	0.1

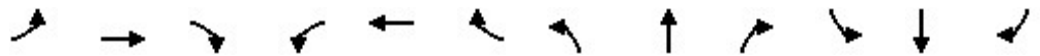
Lanes, Volumes, Timings
1059: John R St & W State Fair Ave

Project Panda
2032 Build - PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	10	11	11	10	12	12	10	12	12	10	12	12
Storage Length (ft)	50		0	50		0	70		0	70		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1144			1401			1021			1264	
Travel Time (s)		26.0			31.8			23.2			28.7	
Lane Group Flow (vph)	20	240	0	98	463	0	80	390	0	73	255	0
v/c Ratio	0.09	0.33		0.23	0.62		0.20	0.51		0.22	0.34	
Control Delay	11.2	11.4		12.2	16.3		11.6	13.2		12.3	11.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	11.2	11.4		12.2	16.3		11.6	13.2		12.3	11.3	
Queue Length 50th (ft)	4	43		19	99		15	74		14	46	
Queue Length 95th (ft)	15	85		44	172		37	132		34	82	
Internal Link Dist (ft)		1064			1321			941			1184	
Turn Bay Length (ft)	50			50			70			70		
Base Capacity (vph)	230	728		435	744		401	767		329	759	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.09	0.33		0.23	0.62		0.20	0.51		0.22	0.34	
Intersection Summary												
Area Type:	Other											

Lanes, Volumes, Timings

1404: SB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]/WB M-102 [8 Mile Srv Rd] / SB M-1 [Woodward Ave Srv Rd]



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	14	12	14	9	12	12	12	12	12	11	13
Storage Length (ft)	0		0	110		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Link Speed (mph)		40			40			40			40	
Link Distance (ft)		1243			174			245			473	
Travel Time (s)		21.2			3.0			4.2			8.1	
Lane Group Flow (vph)	0	0	0	203	540	0	0	0	0	0	914	0
v/c Ratio				0.18	0.27						0.73	
Control Delay				4.3	5.1						27.0	
Queue Delay				1.2	0.7						0.0	
Total Delay				5.5	5.8						27.0	
Queue Length 50th (ft)				26	42						126	
Queue Length 95th (ft)				53	65						171	
Internal Link Dist (ft)		1163			94			165			393	
Turn Bay Length (ft)				110								
Base Capacity (vph)				1152	2032						1250	
Starvation Cap Reductn				739	1095						0	
Spillback Cap Reductn				0	0						0	
Storage Cap Reductn				0	0						0	
Reduced v/c Ratio				0.49	0.58						0.73	

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 1804: NB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2032 Build - PM Peak Hour



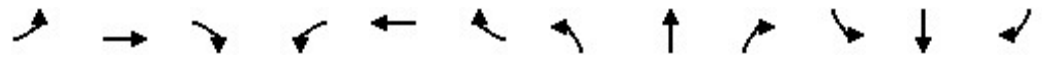
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	14	9	9	12	12	12	11	11	11	12	12	12
Storage Length (ft)	110		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		166			991			1294				234
Travel Time (s)		2.8			16.9			22.1				4.0
Lane Group Flow (vph)	339	700	0	0	0	0	0	964	0	0	0	0
v/c Ratio	0.29	0.35						0.80				
Control Delay	3.6	3.8						33.4				
Queue Delay	1.5	0.9						0.0				
Total Delay	5.2	4.7						33.4				
Queue Length 50th (ft)	25	31						156				
Queue Length 95th (ft)	58	57						204				
Internal Link Dist (ft)		86			911			1214				154
Turn Bay Length (ft)	110											
Base Capacity (vph)	1157	2026						1198				
Starvation Cap Reductn	623	980						0				
Spillback Cap Reductn	0	0						0				
Storage Cap Reductn	0	0						0				
Reduced v/c Ratio	0.63	0.67						0.80				

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 2915: Market Place Dr/Crossover & EB M-102 [8 Mile Rd]

Project Panda
 2032 Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑	↗						↘↘	↘	↑	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	14	12	12	12	12	12	11	16	16	16
Storage Length (ft)	0		280	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		2	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			No	No		Yes
Link Speed (mph)		40			40			25				40
Link Distance (ft)		269			680			385				86
Travel Time (s)		4.6			11.6			10.5				1.5
Lane Group Flow (vph)	0	3184	129	0	0	0	0	0	228	78	125	0
v/c Ratio		0.59	0.10						0.92	0.46	0.71	
Control Delay		7.2	1.0						110.8	79.2	93.1	
Queue Delay		0.0	0.0						0.0	0.0	0.0	
Total Delay		7.2	1.0						110.8	79.2	93.1	
Queue Length 50th (ft)		184	0						136	79	129	
Queue Length 95th (ft)		191	m10						#230	137	203	
Internal Link Dist (ft)		189			600			305				6
Turn Bay Length (ft)			280									
Base Capacity (vph)		5401	1250						248	184	194	
Starvation Cap Reductn		0	0						0	0	0	
Spillback Cap Reductn		0	0						0	0	0	
Storage Cap Reductn		0	0						0	0	0	
Reduced v/c Ratio		0.59	0.10						0.92	0.42	0.64	

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	16	12	12	12
Storage Length (ft)		0	230		0	0
Storage Lanes		0	2		0	0
Taper Length (ft)			25		25	
Link Speed (mph)	40			40	40	
Link Distance (ft)	311			682	86	
Travel Time (s)	5.3			11.6	1.5	
Lane Group Flow (vph)	0	0	203	3417	0	0
Intersection Summary						
Area Type:	Other					

Lanes, Volumes, Timings
 4046: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 Build - PM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	1695
Future Volume (vph)	0	0	0	0	0	1695
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Satd. Flow (prot)	2222	0	0	0	0	7941
Flt Permitted						
Satd. Flow (perm)	2222	0	0	0	0	7941
Link Speed (mph)	25		40			40
Link Distance (ft)	107		492			325
Travel Time (s)	2.9		8.4			5.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	1842
Sign Control	Stop		Free			Free

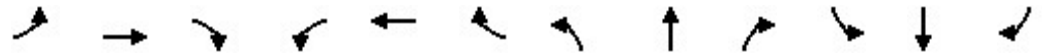
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.1%
ICU Level of Service	B
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Queues on the major and minor streets should be 0 FT as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
 4946: NB M-1 [Woodward Ave] & Crossover/State Fair Gate #5

Project Panda
 2032 Build - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↑↑↑↑↔				
Traffic Volume (vph)	0	0	0	0	0	0	0	4093	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	4093	0	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	12	12
Satd. Flow (prot)	0	0	0	0	2222	0	0	7941	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	2222	0	0	7941	0	0	0	0
Link Speed (mph)		25			25			40				40
Link Distance (ft)		107			965			473				267
Travel Time (s)		2.9			26.3			8.1				4.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	4449	0	0	0	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.1% ICU Level of Service B
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Queues on the major and minor streets should be 0 FT as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

APPENDIX – K

Signal Warrant Analysis

2022 Build Phase I

Summary of Warrants

Spot Number:	82143-01-915		
Major Street:	Eight Mile Rd	Minor Street:	Crossover (East of Ra
Intersection:	Eight Mile Rd at Crossover (East of Ralston St)		
City/Twp:	City of Detroit		
Date Performed:	8/18/2020	Performed By:	LANGAN
Date Volumes Collected:	5/8/2012		

Warrant	Condition	Is Warrant Met
Data Has Been Validated		YES
WARRANT 1: Eight-Hour Vehicular Volume		NO
	Condition A	NO
	Condition B	NO
	Condition A&B	N/A
WARRANT 2: Four-Hour Vehicular Volume	(70%)	YES
WARRANT 3: Peak-Hour Vehicular Volume	(70%)	YES
	Condition A	N/A
	Condition B	YES
WARRANT 4: Pedestrian Volume	(70%)	NO
	Four Hour	N/A
	Peak Hour	N/A
	(Threshold) HAWK	NO
	(Threshold) RRFB	NO
WARRANT 5: School Crossing		NO
WARRANT 6: Coordinated Signal System		NO
WARRANT 7: Crash Experience		NO
	Condition A	NO
	Condition B	NO
WARRANT 8: Roadway Network		NO
WARRANT 9: Intersection Near a Grade Crossing		#N/A

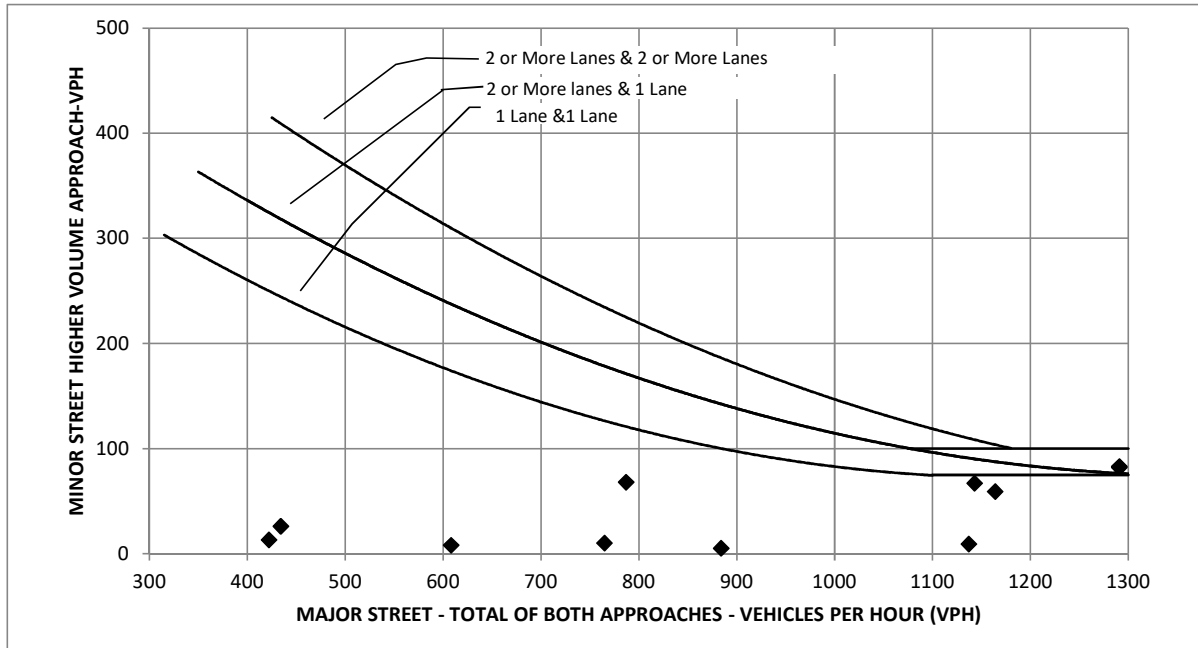
Issue to Be Addressed by Signalization:

Facilitate site traffic entering / exiting the site.

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 3 B(70%): Peak-Hour Vehicular Volume**

Spot Number:	82143-01-915		
Intersection:	Eight Mile Rd @ Crossover (East of Ralston St)		
Date	8/18/2020	by	LANGAN

7	: No. of Lanes on Major St.
2	: No. of Lanes on Minor St.
42	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an Isolated community?
0	: What is the of the population isolated community?

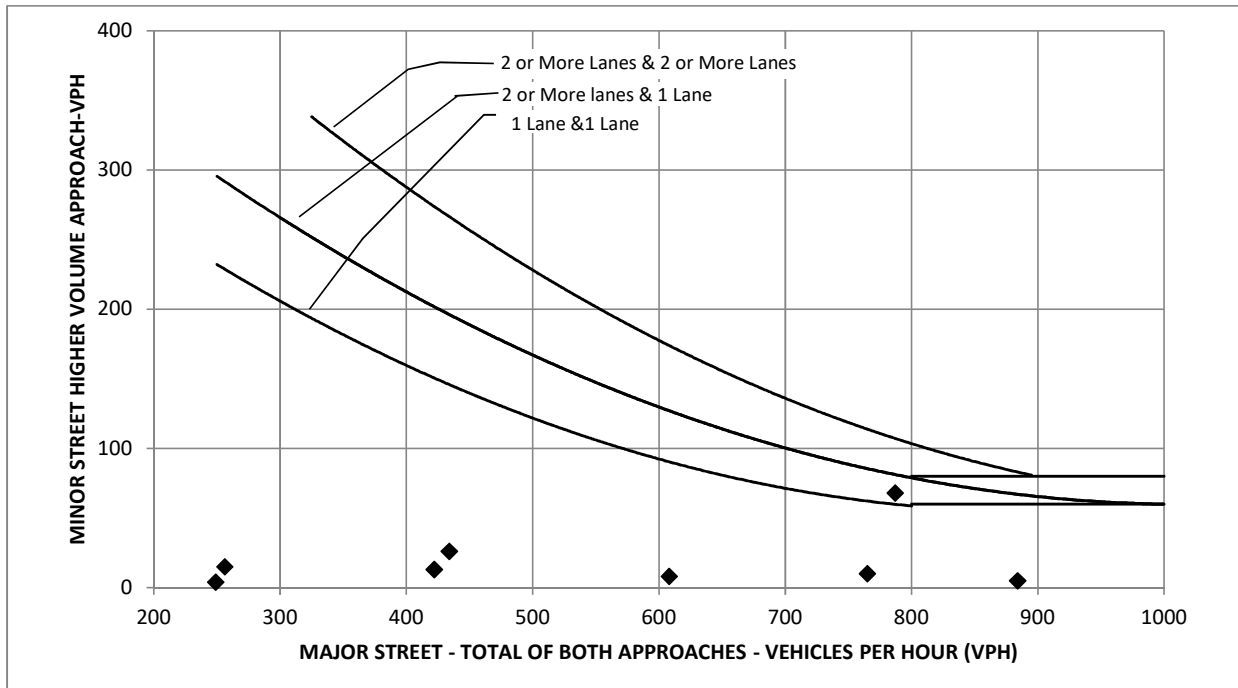


How Many Hours Are Met	2
Is Warrant (70%) Met?	YES

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 2: Four-Hour Vehicular Volume**

Spot Number:	82143-01-915
Intersection:	Eight Mile Rd @ Crossover (East of Ralston St)
Date	8/18/2020 by LANGAN

7	: No. of Lanes on Major St.
2	: No. of Lanes on Minor St.
42	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an isolated community?
0	: What is the of the population isolated community?



How Many Hours Are Met	5
Is Warrant (70%) Met?	YES

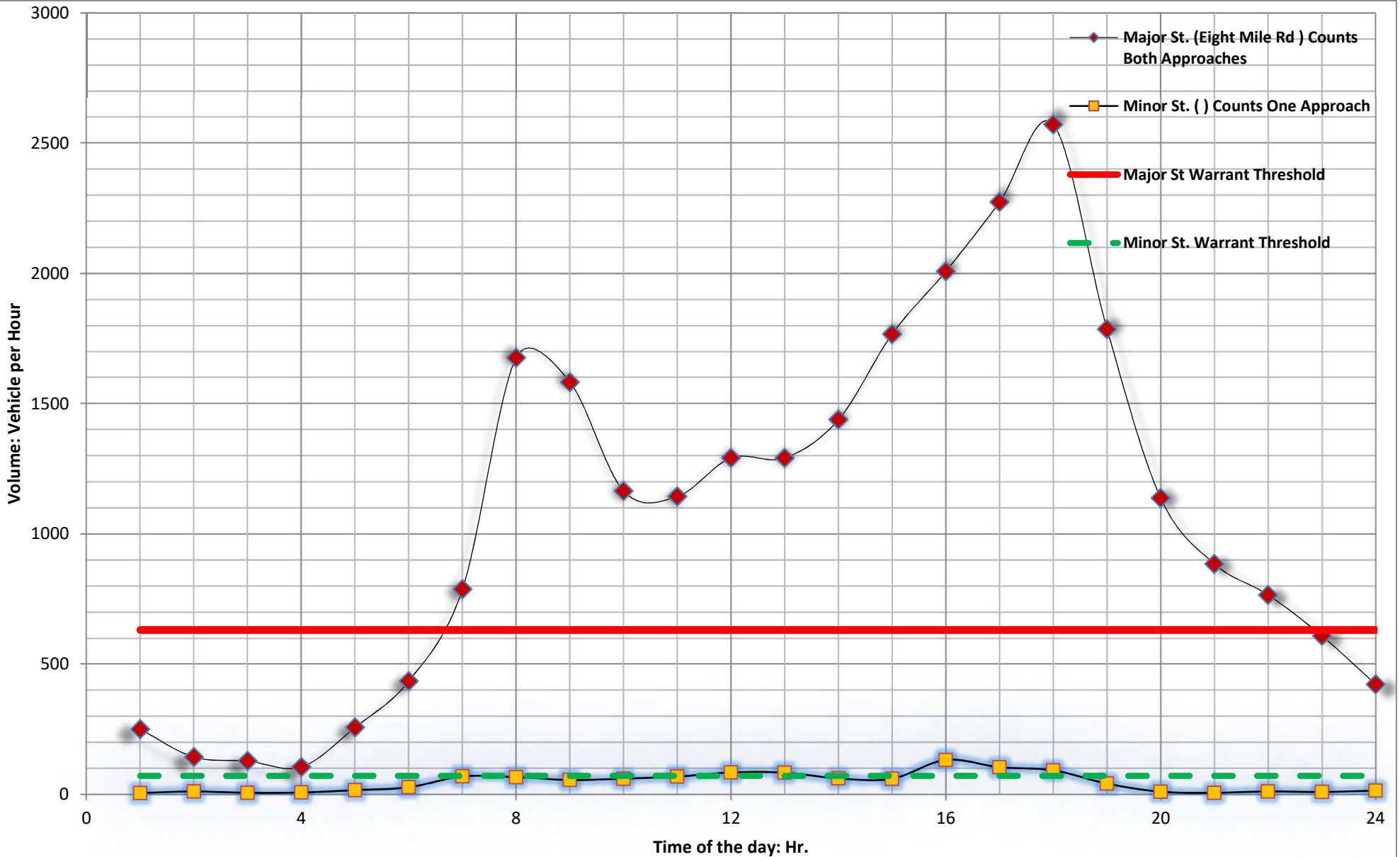


FIGURE 1: WARRANT 1B

IS THERE A REDUCTION IN THE WARRANT THRESHOLDS TO 70% ...

1- DUE TO SPEED? YES

2- DUE TO ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000? NO

Spot Number: 82143-01-915

Eight Mile Rd @ Crossover (East of Ralston St)

NO. OF LANES ON MAJOR ST.? 7

NO. OF LANES ON MINOR ST.? 2

Number of Hours that met the Warrant: 5

Does this intersection meet Warrant 1B for signal installation? NO

Data Collection Date: 5/8/2012

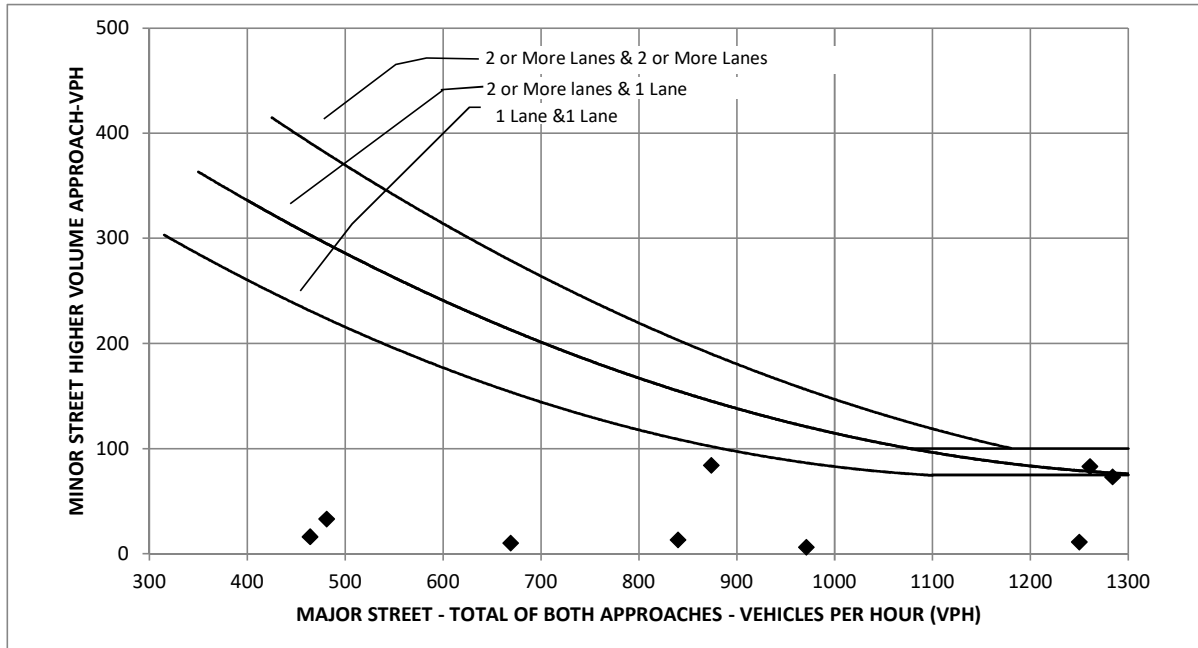
2032 Build Master Plan

Summary of Warrants			
Spot Number:	82143-01-915		
Major Street:	Eight Mile Rd	Minor Street:	Crossover (East of Ra
Intersection:	Eight Mile Rd at Crossover (East of Ralston St)		
City/Twp:	City of Detroit		
Date Performed:	8/18/2020	Performed By:	LANGAN
Date Volumes Collected:	5/8/2012		
Warrant	Condition	Is Warrant Met	
Data Has Been Validated		YES	
WARRANT 1: Eight-Hour Vehicular Volume		YES	
	Condition A	NO	
	Condition B	YES	
	Condition A&B	N/A	
WARRANT 2: Four-Hour Vehicular Volume	(70%)	YES	
WARRANT 3: Peak-Hour Vehicular Volume	(70%)	YES	
	Condition A	N/A	
	Condition B	YES	
WARRANT 4: Pedestrian Volume	(70%)	NO	
	Four Hour	N/A	
	Peak Hour	N/A	
	(Threshold) HAWK	NO	
	(Threshold) RRFB	NO	
WARRANT 5: School Crossing		NO	
WARRANT 6: Coordinated Signal System		NO	
WARRANT 7: Crash Experience		NO	
	Condition A	NO	
	Condition B	NO	
WARRANT 8: Roadway Network		NO	
WARRANT 9: Intersection Near a Grade Crossing		#N/A	
Issue to Be Addressed by Signalization:			
Facilitate site traffic entering / exiting the site.			

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 3 B(70%): Peak-Hour Vehicular Volume**

Spot Number:	82143-01-915		
Intersection:	Eight Mile Rd @ Crossover (East of Ralston St)		
Date	8/18/2020	by	LANGAN

7	: No. of Lanes on Major St.
2	: No. of Lanes on Minor St.
42	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an Isolated community?
0	: What is the of the population isolated community?



How Many Hours Are Met

5

Is Warrant (70%) Met?

YES

**Michigan Manual of Uniform Traffic Control Devices
Worksheet for Signal Warrants (Section 4C)
WARRANT 2: Four-Hour Vehicular Volume**

Spot Number:	82143-01-915
Intersection:	Eight Mile Rd @ Crossover (East of Ralston St)
Date	8/18/2020 by LANGAN

7	: No. of Lanes on Major St.
2	: No. of Lanes on Minor St.
42	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an isolated community?
0	: What is the of the population isolated community?



How Many Hours Are Met

6

Is Warrant (70%) Met?

YES

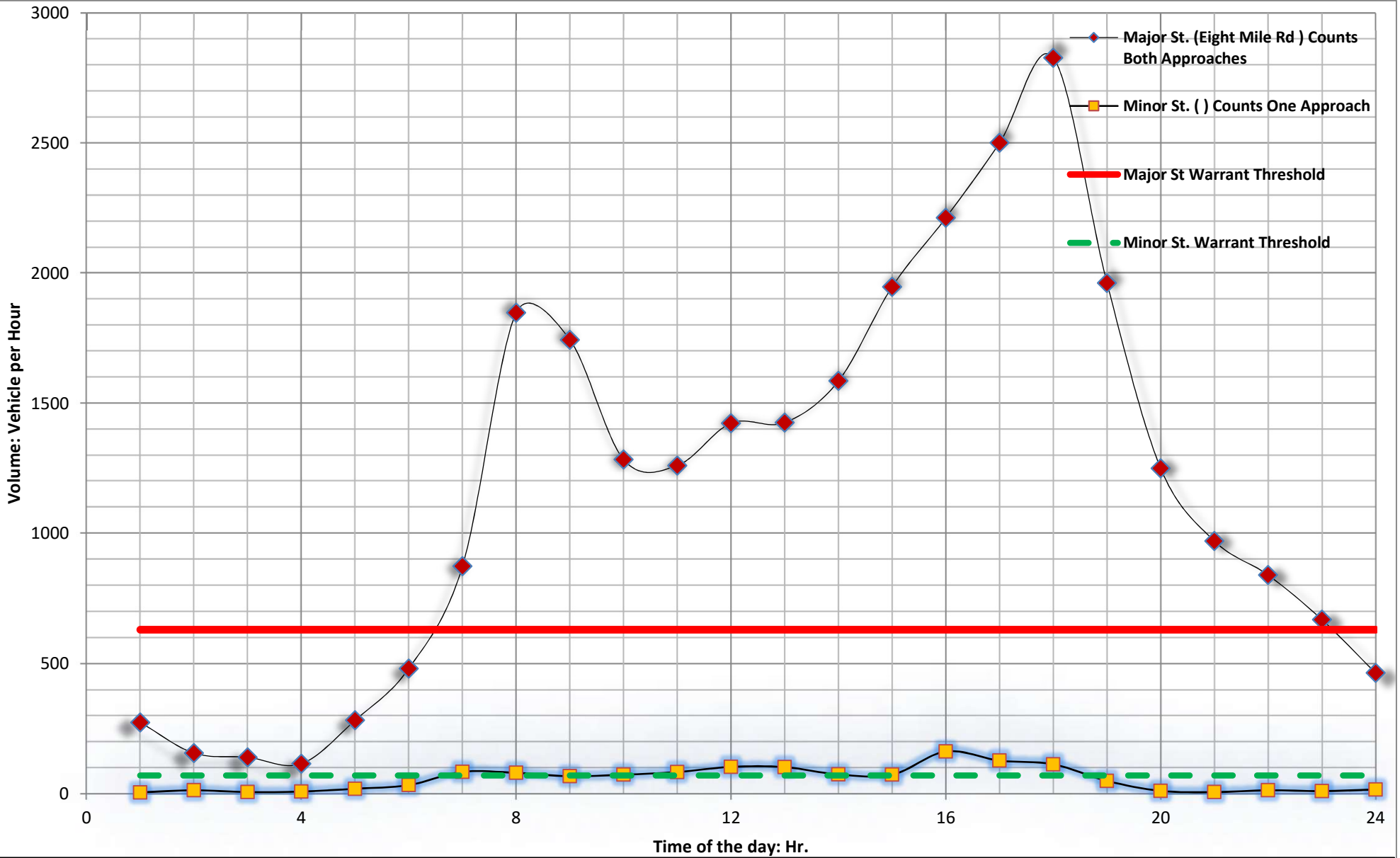


FIGURE 1: WARRANT 1B

IS THERE A REDUCTION IN THE WARRANT THRESHOLDS TO 70% ...

1- DUE TO SPEED? YES

2- DUE TO ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000? NO

Spot Number: 82143-01-915

Eight Mile Rd @ Crossover (East of Ralston St)

NO. OF LANES ON MAJOR ST.? 7

NO. OF LANES ON MINOR ST.? 2

Number of Hours that met the Warrant: 11

Does this intersection meet Warrant 1B for signal installation? YES

Data Collection Date: 5/8/2012

APPENDIX – L

Response to Comment Letter

August 21, 2020

Margaret Ceifetz
Michigan Department of Transportation
MDOT Metro Region
6333 Lansing Road
Lansing, MI 48917

Caleb Seder, P.E.
Michigan Department of Transportation
MDOT Metro Region
6333 Lansing Road
Lansing, MI 48917

Luke Polcyn
Deputy Group Executive
Jobs & Economy Team
City of Detroit, Mayor's Office

Re: Response to Project Panda TIS Comments

Dear Margaret / Caleb / Luke,

Langan Engineering & Environmental Services (Langan) is pleased to provide the following responses (*listed in italic*) to the MDOT general study comments dated July 31, 2020 & August 05, 2020 and City of Detroit comments dated August 03, 2020. All comments are **listed in bold** below and summarized if needed.

MDOT Comments

- 1. I am satisfied with the approach and methodology used to grow traffic volumes given the inability to collect current volumes.**

Comment noted.

- 2. What are the approximate hours of the two shifts?**

The majority of the day shift (@60%) is anticipated to arrive between 6:30 – 7:30 AM prior to the typical AM commuter peak hour and depart between 5:30 – 6:30 PM after the typical PM commuter peak hour. Similarly, the majority of the night shift (@60%) is anticipated to arrive between 5:30 – 6:30 PM after the typical PM commuter peak hour and depart between 4:30 – 5:30 AM prior to the typical AM commuter peak hour. This information has been included in the report.

- 3. Where is [the transit station] being relocated to? Will the access points change?**

The transit station is being relocated on the State Fair Grounds property and is anticipated to be developed adjacent to Site Driveway A on the northwestern corner of the site. The proposed transit location is illustrated on the site plan (Figure 2). Existing transit access is only from Woodward Avenue, while proposed access will be from Woodward Avenue and Eight Mile Road.

- 4. Has it been determined where the entrance and exit for this relocation will be? It appears as though the transit station has been split into two? This access is important to the surrounding community.**

Final details concerning the proposed transit center have not been confirmed yet. However, as mentioned above there will be two (2) access points to the relocated transit station: one (1) access point will remain along Woodward Avenue at the existing transit station access point (Site Driveway B) and a secondary access point will be provided along Eight Mile Road (Site Driveway A).

- 5. What is the largest size truck expected? WB-??**

The site was designed assuming the largest truck size is a WB-67.

- 6. This should include ped facilities and signals infrastructure [at the Eight Mile Road & Site Driveway A intersection, Woodward Avenue & Site Driveway B intersection, and the Woodward Avenue & West State Fair Street intersection] as well, please.**

Comment noted. Pedestrian facilities and signal infrastructure will be upgraded / added as part of the offsite roadway improvement package at the following intersections:

- *Eight Mile Road & Site Driveway A*
- *Woodward Avenue & Site Driveway B*
- *Woodward Avenue & West State Fair Street*

- 7. Has the City or transit company been contacted about moving the transit station from Woodward onto the property?**

The City is fully aware of discussions regarding relocating the transit station and is very supportive.

- 8. The TIS states two shifts of 993 employees, but total site generated traffic is 545 and 589 for AM and PM respectively. Why is there a large difference in volumes? Mode split reductions only accounts for 10%.**

Trip generation methodology contained in the Trip Generation Manual, 10th Edition, published by the Institute of Transportation Engineers (ITE) provides trip generation rates for Warehousing (Land Use Code 150) based on the number of employees per shift. ITE methodology assumes that the majority of the employees will arrive and depart within the peak hour; however, there are still employees anticipated to arrive and depart outside of the peak hours. The ITE methodology is consistent with the aforementioned employee arrival and departure times and was previously approved by MDOT and the City as part of the preliminary submission.

9. Require signal warrant analysis for EB 8 Mile @ Driveway A with 8 hour turning movement counts to check 8 hour warrants.

Peak hour signal warrants, four-hour signal warrants, and eight-hour signal warrants were conducted for the eastbound Eight Mile Road & Site Driveway A intersection. The peak hour signal warrants are satisfied for both AM & PM peak hours during the 2022 Build and 2032 Build conditions. The four-hour signal warrants are satisfied for both 2022 Build and 2032 Build conditions. The eight-hour signal warrants are satisfied for the 2032 Build conditions. Signal warrants have been included in the appendix.

10. Require models for build years without proposed signal modifications at EB 8 Mile. How do we know existing configuration won't work with acceptable LOS?

*A 2032 Build ALT condition was examined for the AM and PM peak hour which does not include the proposed full access signalized Eight Mile Road & Site Driveway A intersection. Additional volume figures (**Figure 13 – 15**) are included in **Appendix M** which detail the proposed trip routing for the 2032 Build ALT condition.*

The proposed westbound left turn into Site Driveway A would be diverted to make a westbound left turn (U-turn) at the Meijer Driveway intersection. In theory, adding more volume to this westbound left turn (U-turn) movement at the Meijer Driveway would have to result in more delay to the eastbound Eight Mile Road and northbound Meijer Driveway movements. While the proposed intersection condition at Site Driveway A could be designed so the westbound left turn and northbound movement would be coordinated with the Meijer Driveway intersection so as not to add any additional delay.

*Based on the capacity analyses models, significant queues occur for the westbound left turning movement at the Eight Mile Road & Meijer Driveway intersection which spill back and block thru traffic travel west along Eight Mile Road. Capacity analyses also indicate an increase in delays for the eastbound Eight Mile Road and northbound Meijer Driveway movements. Additionally, the re-routed northbound Site Driveway A left turn trips will be forced to use the Woodward Avenue Service Road which is shown to already have some congested operations. The 2032 Build ALT capacity analyses printouts and queue length printouts are contained in **Appendix M**.*

Based on the alternative analyses performed and satisfying the aforementioned traffic signal warrants, we continue to recommend signalizing the eastbound Eight Mile Road & Site Driveway A intersection as the preferred alternative.

11. EB 8 Mile @ Meijer and NB Woodward at State Fair Gate #5 signals not modeled.

The Synchro models have been revised to include both the Eight Mile Road & Meijer Driveway intersection and the Woodward Avenue & State Fair Gate #5 intersection.

Since the signalized Woodward Avenue & State Fair Gate #5 intersection is set to flash during normal peak hour operations and only used during events, this intersection was coded as a two-way stop-controlled intersection because Synchro does not support

flashing intersections. There are no westbound volumes exiting the existing parking lot and there are no northbound right volumes entering the parking lot so there are no delays or queues at this intersection. MDOT could consider potentially removing this signal after the proposed development is constructed as there will be no operational need for it to serve special events held at the State Fair Grounds property.

12. Was it considered to direct Driveway A left turn vehicles to use the NB Woodward driveway to avoid turning left onto 8 Mile? May not need the NB left turn at Driveway A.

Please refer to the response to MDOT Comment #10.

13. If NB left turn vehicles are kept at Driveway A, intersection should be modeled with dedicated through and right turn lanes.

The Build Synchro models have been revised to include a separate northbound thru and northbound right turn lane at Site Driveway A.

14. Existing SB driveway across from Driveway A not modeled.

As discussed during our comment review conference call, this comment can be ignored as the existing southbound driveway at the Eight Mile Road & Site Driveway A intersection is included in the Synchro models.

City of Detroit Comments

1. Per study the development will add 993 employees per shift but the analysis including approximately 600. The TIS does not include shift change times for the 993 employees. Is there an overlap in trips during the shift change and how has the study accounted for this? Is the study assuming other cars/trips will be arriving outside of the peak hour, if so provide the details? Please provide the step by step method used to calculate the A.M and P.M Peak hour trips

Please refer to the response to MDOT Comment #2 and MDOT Comment #8.

2. The overall site plan shows the relocation of the transit center but failed to identify where to and show it on a map. Is the transit station a park and ride type of station or walk-in station? The park and ride has the tendency to generate more trips. And if the transit center is moved there is a litany of considerations that need to be taken: signalization, residents, turning radii, queueing, added trips on State fair for drop-off cars, etc.

The bus station will be relocated to the northwest corner of the State Fair Grounds property on the western side of Site Driveway A. Final details concerning the proposed transit center have not been confirmed yet. Additional coordination measures are being undertaken to facilitate the relocation of the bus station. The proposed transit location is illustrated on the site plan (Figure 2).

- 3. The volume distribution numbers don't add up and are poorly explained. (e.g.: cars vs trucks, entrances, ...) - ~550 added trips appear to be entering the site in the schematic. No mention of bus entrance.**

The trip distribution numbers on the site trip figures have been revised so that they accurately illustrate the proposed distributions for both employees and trucks.

There will be two (2) access points to the relocated transit station: one (1) access point will remain along Woodward Avenue at the existing transit station access point (Site Driveway B) and a secondary access point will be provided along Eight Mile Road (Site Driveway A).

- 4. Provide a clearer explanation of trip distribution on streets. W State Fair and Woodward already has LOS D. If more trips are distributed to this for any reason for example, recirculation to driveway on W State Fair etc., the intersection may rapidly deteriorate.**

Trip distributions for both employees and trucks are now included in the report.

The northbound and southbound mainline movements on Woodward Avenue operate at a LOS A or B with very little delay. As such, the intersection operates at an overall LOS C or better during all AM and PM peak hours and indicates there is excess capacity. If side street delays are a concern, the proposed signal timing optimizations to shift additional green time to the minor street approach would address that concern while still providing overall acceptable intersection LOS.

- 5. Need analysis for John R and State Fair intersection (Consultant indicated that they working on collecting data)**

Turning movement counts at the John R Street & West State Fair Street intersection were collected in July 2020. These peak hour volumes were adjusted according to the City of Detroit's request to account for potentially lower counts due to COVID-19 and analyses were conducted and included in the report.

- 6. Analysis of Woodward and State fair is showing an LOS of E. (this may quickly deteriorate once the busses are added and the added drop-off trips)**

Please refer to response to City of Detroit Comment #4 above.

- 7. The analysis is not showing Queue length and storage capacity of the lanes (and potential blockage on the roads) – e.g.: LOS may sometimes be ok for a LT lane, but the queue may back up blocking the through movement. Simple mitigation item.**

A queue table has been included for your reference.

8. How will trucks be restricted from using W State Fair Street given that it's a residential street?

Signage will be proposed within the public Right-Of-Way of state and county roads to direct trucks to using the proper entrance (Site Driveway A or Site Driveway B). Additionally, the internal site driveway can be channelized with raised medians to route trucks away from W State Fair Street.

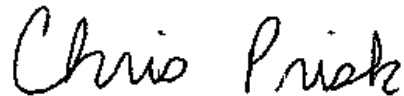
9. Traffic Engineering Division is requesting virtual meeting with consultant.

A virtual meeting with the City of Detroit, Langan, and Hillwood was held on August 4, 2020. A separate virtual meeting with MDOT, Langan, and Hillwood was held on August 7, 2020.

If you should have any comments or questions please contact me via phone (724) 514-5154 or email cprisk@langan.com.

Sincerely,

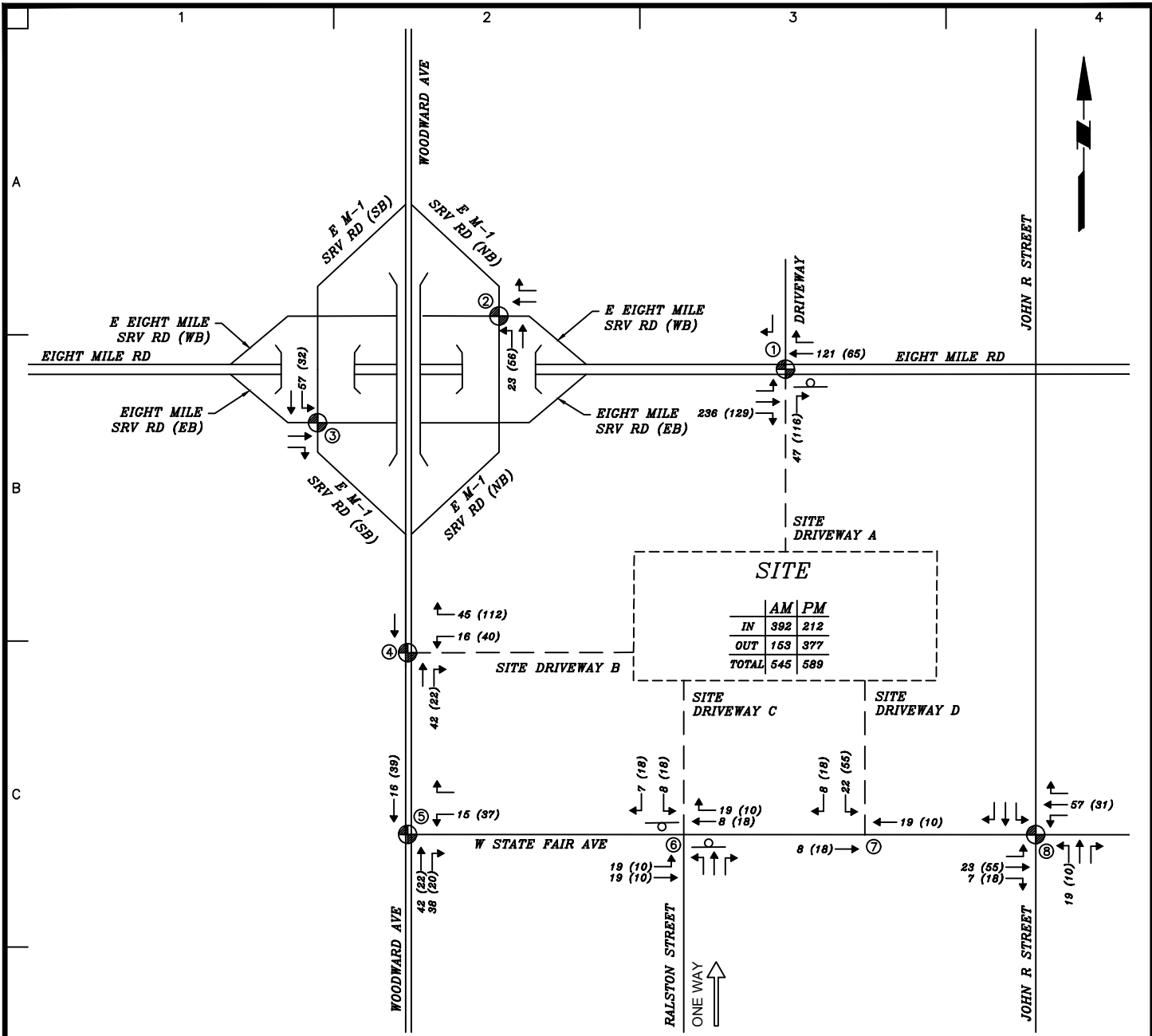
Langan Engineering and Environmental Services, Inc.



Christopher A. Prisk, P.E., PTOE
Senior Project Manager

APPENDIX – M

2032 Build ALT Volume Figures & Capacity Analysis



LEGEND

- XX - AM PEAK HOUR
- (XX) - PM PEAK HOUR
- - STOP SIGN
- ⊙ - TRAFFIC SIGNAL
- # - INTERSECTION ID
- ⊙(X%) - TRIP DISTRIBUTION (IN | OUT)

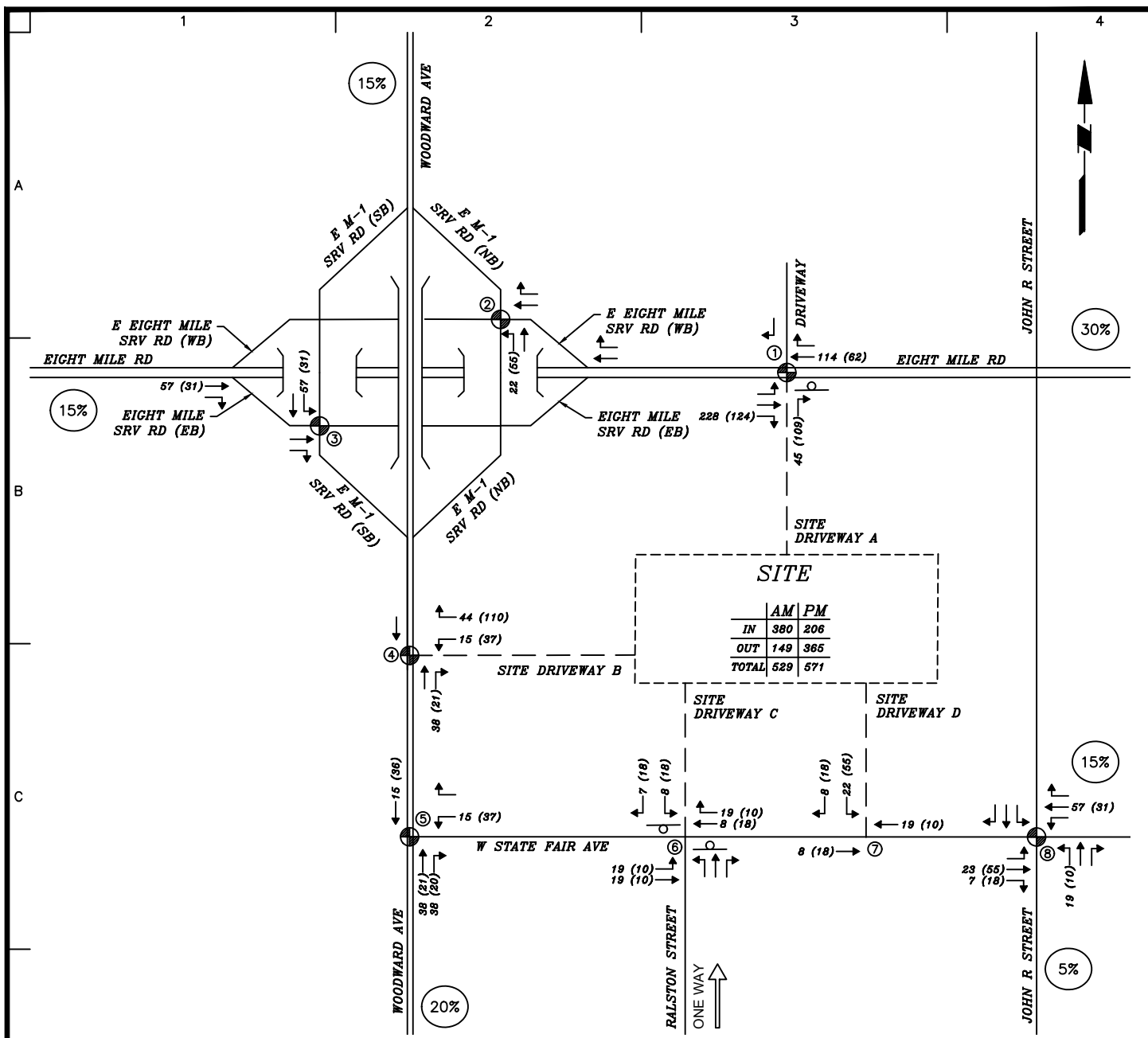
LANGAN
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 Canonsburg, PA 15317
 T: 724.514.5100 F: 724.514.5101 www.langan.com

Project
PROJECT PANDA
 CITY OF DETROIT
 WAYNE COUNTY MICHIGAN

Drawing Title
ALTERNATE TOTAL PHASE 1 SITE TRIPS

Project No.
 250095201
 Date
 AUGUST 2020
 Drawn By
 JMK
 Checked By
 CAP

Figure
13



LEGEND

- XX - AM PEAK HOUR
- (XX) - PM PEAK HOUR
- - STOP SIGN
- ⊙ - TRAFFIC SIGNAL
- # - INTERSECTION ID
- ⊙x% - TRIP DISTRIBUTION (IN | OUT)

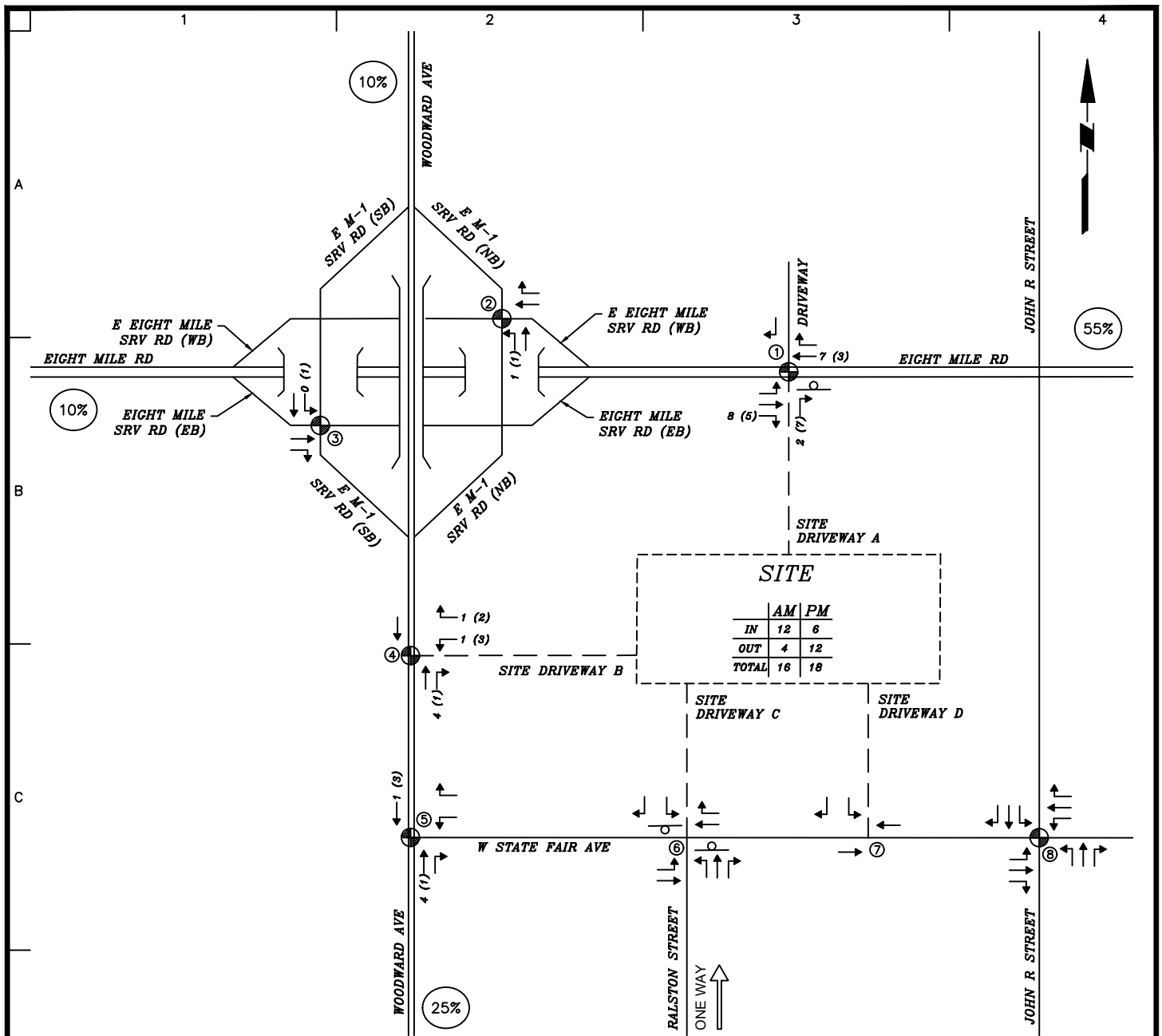
LANGAN
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Project
PROJECT PANDA
 CITY OF DETROIT
 WAYNE COUNTY MICHIGAN

Drawing Title
**ALTERNATE PHASE 1
 EMPLOYEE
 SITE TRIPS**


Project No.
 250095201
 Date
 AUGUST 2020
 Drawn By
 JMK
 Checked By
 CAP

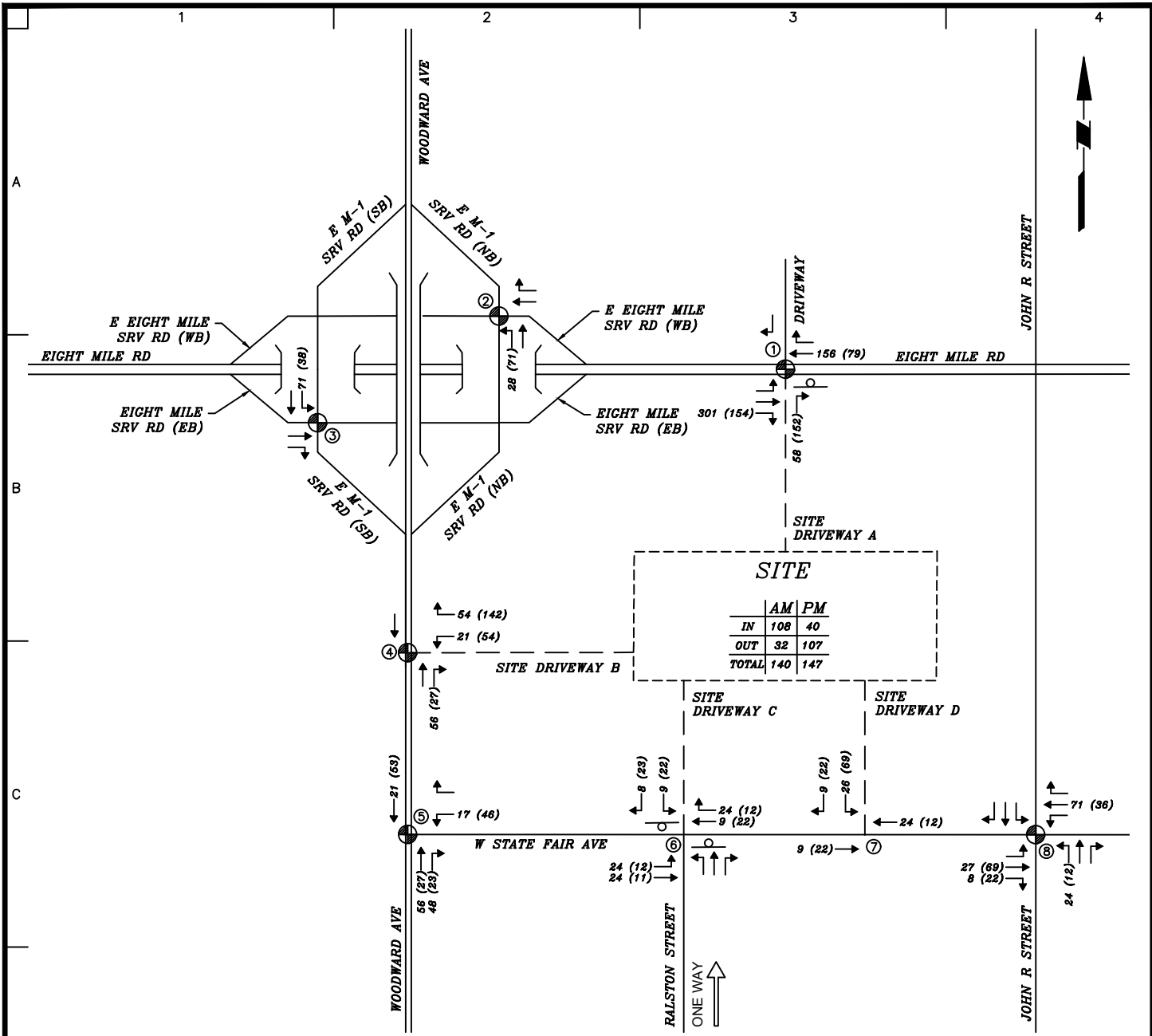
Figure
13A



LEGEND


- XX - AM PEAK HOUR
- (XX) - PM PEAK HOUR
- - STOP SIGN
- ⊙ - TRAFFIC SIGNAL
- # - INTERSECTION ID
- ⊙X% - TRIP DISTRIBUTION (IN | OUT)

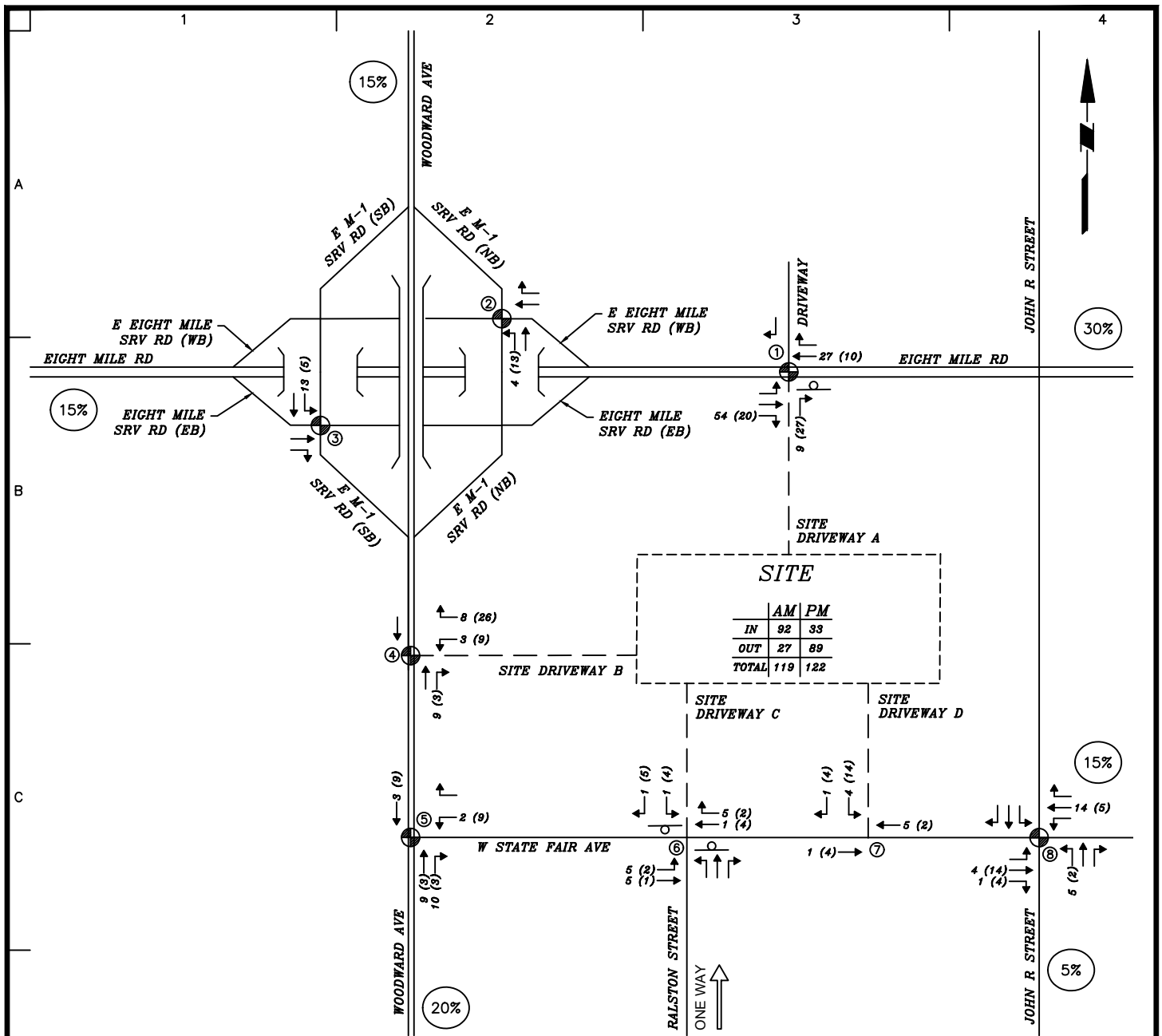
 <p>Langan Engineering and Environmental Services, Inc. 2400 Ansys Drive, Suite 403 Canonsburg, PA 15317</p> <p>T: 724.514.5100 F: 724.514.5101 www.langan.com</p>	<p>Project</p> <h2>PROJECT PANDA</h2> <p>CITY OF DETROIT WAYNE COUNTY MICHIGAN</p>	<p>Drawing Title</p> <h2>ALTERNATE PHASE 1 TRUCK SITE TRIPS</h2>	<p>Project No. 250095201</p> <p>Date AUGUST 2020</p> <p>Drawn By JMK</p> <p>Checked By CAP</p>
			<h1>13B</h1>



LEGEND

- XX - AM PEAK HOUR
- (XX) - PM PEAK HOUR
- - STOP SIGN
- ⊙ - TRAFFIC SIGNAL
- # - INTERSECTION ID
- ⊙ X% - TRIP DISTRIBUTION (IN | OUT)

 <p>Langan Engineering and Environmental Services, Inc. 2400 Ansys Drive, Suite 403 Canonsburg, PA 15317</p> <p>T: 724.514.5100 F: 724.514.5101 www.langan.com</p>	<p>Project</p> <p>PROJECT PANDA</p> <p>CITY OF DETROIT WAYNE COUNTY MICHIGAN</p>	<p>Drawing Title</p> <p>ALTERNATE TOTAL PHASE 2 SITE TRIPS</p>	<p>Project No. 250095201</p> <p>Date AUGUST 2020</p> <p>Drawn By JMK</p> <p>Checked By CAP</p>	<p>Figure</p> <p>14</p>
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LEGEND

- XX - AM PEAK HOUR
- (XX) - PM PEAK HOUR
- - STOP SIGN
- ⊙ - TRAFFIC SIGNAL
- # - INTERSECTION ID
- ⊙x% - TRIP DISTRIBUTION (IN | OUT)

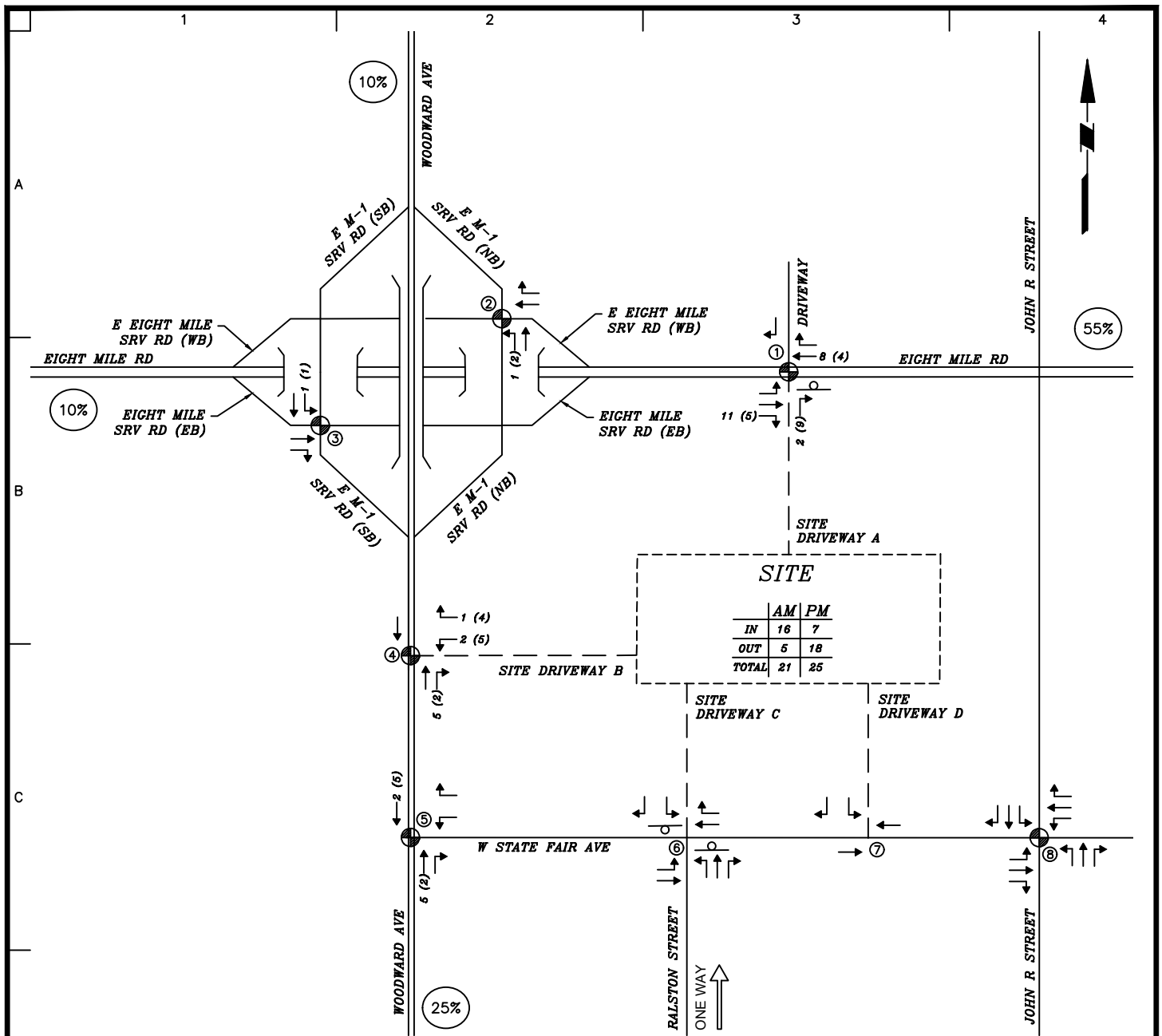
LANGAN
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Project
PROJECT PANDA
 CITY OF DETROIT
 WAYNE COUNTY MICHIGAN

Drawing Title
**ALTERNATE PHASE 2
 EMPLOYEE
 SITE TRIPS**

Project No.
 250095201
 Date
 AUGUST 2020
 Drawn By
 JMK
 Checked By
 CAP

Figure
14A



LEGEND

- XX - AM PEAK HOUR
- (XX) - PM PEAK HOUR
- - STOP SIGN
- ⊗ - TRAFFIC SIGNAL
- # - INTERSECTION ID
- ⊙(X%) - TRIP DISTRIBUTION (IN | OUT)

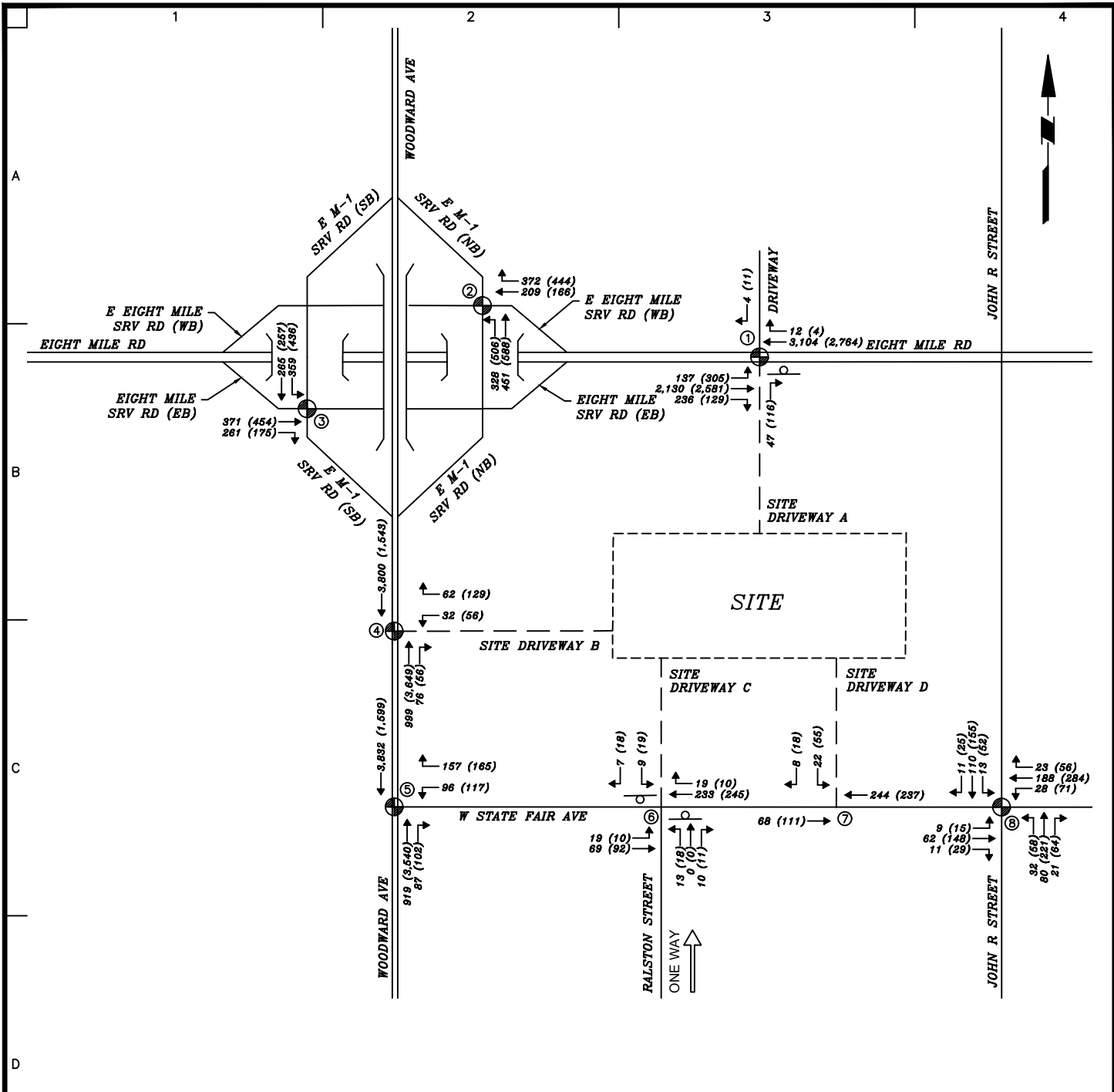
LANGAN
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Project
PROJECT PANDA
 CITY OF DETROIT
 WAYNE COUNTY MICHIGAN

Drawing Title
ALTERNATE PHASE 2 TRUCK SITE TRIPS

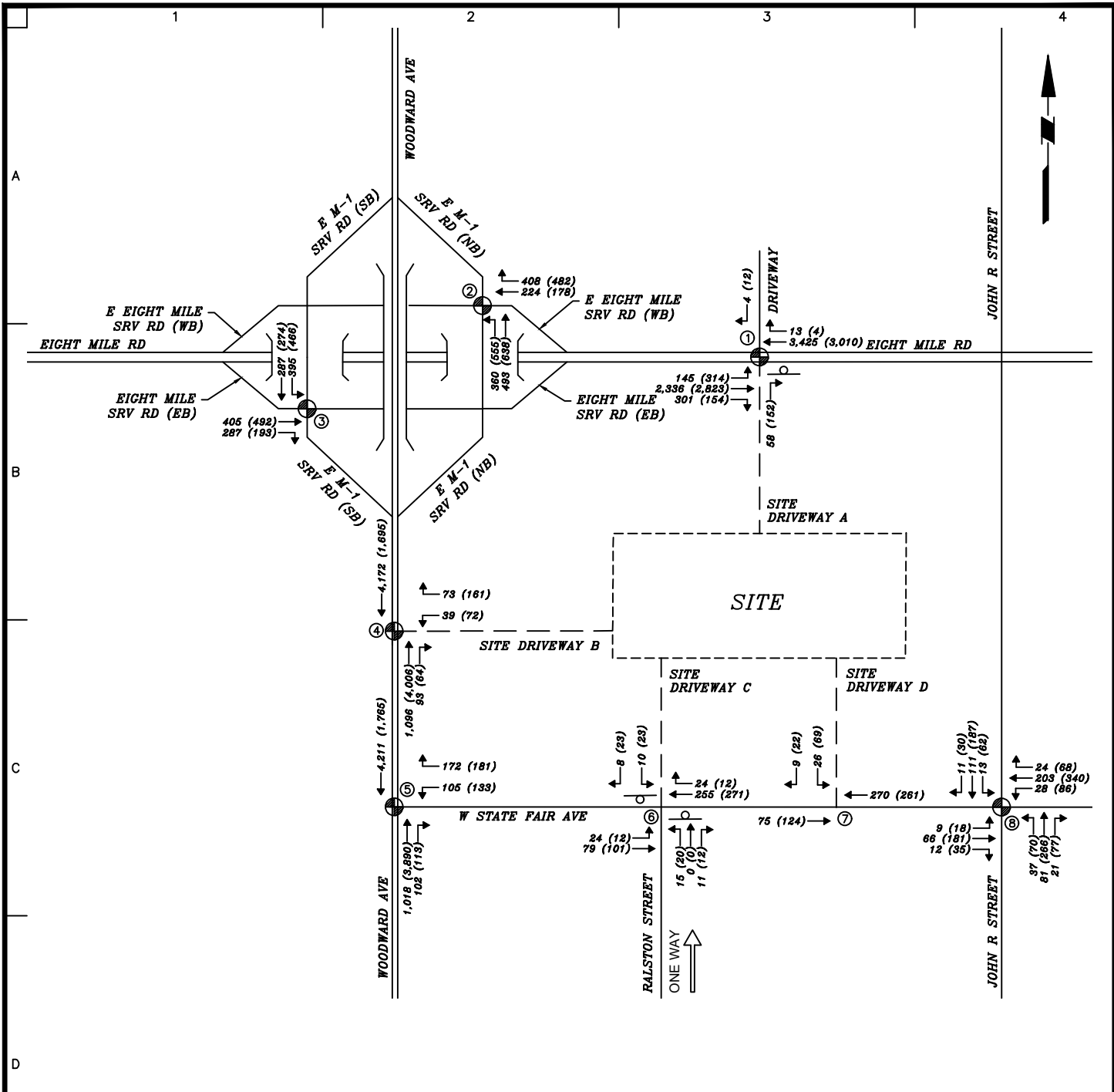
Project No.
 250095201
 Date
 AUGUST 2020
 Drawn By
 JMK
 Checked By
 CAP

Figure
14B



LEGEND	
XX	- AM PEAK HOUR
(XX)	- PM PEAK HOUR
⊖	- STOP SIGN
⊙	- TRAFFIC SIGNAL
⊕	- INTERSECTION ID

<p>LANGAN Langan Engineering and Environmental Services, Inc. 2400 Ansys Drive, Suite 403 Canonsburg, PA 15317</p> <p>T: 724.514.5100 F: 724.514.5101 www.langan.com</p>	<p>Project</p> <p>PROJECT PANDA</p> <p>CITY OF DETROIT WAYNE COUNTY MICHIGAN</p>	<p>Drawing Title</p> <p>ALTERNATE 2022 PHASE 1 BUILD PEAK HOUR TRAFFIC VOLUMES</p>	<p>Project No. 250095201</p> <p>Date AUGUST 2020</p> <p>Drawn By JMK</p> <p>Checked By CAP</p>	<p>Figure</p> <p>15</p>
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LEGEND	
XX	- AM PEAK HOUR
(XX)	- PM PEAK HOUR
⊖	- STOP SIGN
⊙	- TRAFFIC SIGNAL
⊕	- INTERSECTION ID

<p>Langan Engineering and Environmental Services, Inc. 2400 Ansys Drive, Suite 403 Canonsburg, PA 15317</p> <p>T: 724.514.5100 F: 724.514.5101 www.langan.com</p>	Project PROJECT PANDA CITY OF DETROIT WAYNE COUNTY MICHIGAN	Drawing Title ALTERNATE 2032 MASTER PLAN BUILD PEAK HOUR TRAFFIC VOLUMES	Project No. 250095201 Date AUGUST 2020 Drawn By JMK Checked By CAP	Figure 16
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HCM Signalized Intersection Capacity Analysis
 1015: Crossover/Driveway & WB M-102 [8 Mile Rd]

Project Panda
 2032 Build ALT - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑↑		↘↘					↗
Traffic Volume (vph)	0	0	0	0	3425	13	145	0	0	0	0	4
Future Volume (vph)	0	0	0	0	3425	13	145	0	0	0	0	4
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	11	12	14	14	14	11	11	11
Total Lost time (s)					5.3		5.2					5.7
Lane Util. Factor					0.86		0.97					1.00
Frt					1.00		1.00					0.86
Flt Protected					1.00		0.95					1.00
Satd. Flow (prot)					6517		3855					1640
Flt Permitted					1.00		0.95					1.00
Satd. Flow (perm)					6517		3855					1640
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	3723	14	158	0	0	0	0	4
RTOR Reduction (vph)	0	0	0	0	0	0	138	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	3737	0	20	0	0	0	0	4
Turn Type					NA		Prot					Prot
Protected Phases					6		3					4
Permitted Phases												
Actuated Green, G (s)					52.4		10.0					1.4
Effective Green, g (s)					52.4		10.0					1.4
Actuated g/C Ratio					0.65		0.12					0.02
Clearance Time (s)					5.3		5.2					5.7
Vehicle Extension (s)					3.0		3.0					3.0
Lane Grp Cap (vph)					4268		481					28
v/s Ratio Prot					c0.57		c0.01					c0.00
v/s Ratio Perm												
v/c Ratio					0.88		0.04					0.14
Uniform Delay, d1					11.2		30.8					38.7
Progression Factor					1.00		1.00					1.00
Incremental Delay, d2					2.8		0.0					2.3
Delay (s)					14.0		30.8					41.1
Level of Service					B		C					D
Approach Delay (s)		0.0			14.0			30.8				41.1
Approach LOS		A			B			C				D
Intersection Summary												
HCM 2000 Control Delay			14.7		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)				16.2			
Intersection Capacity Utilization			97.6%		ICU Level of Service				F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 1704: NB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]

Project Panda
 2032 Build ALT - AM Peak Hour

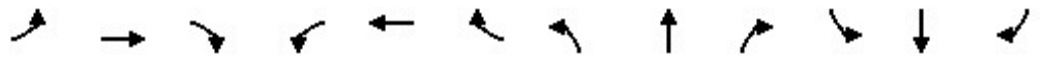


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↑↑↑		↔	↑↑					
Traffic Volume (vph)	0	0	0	0	224	408	360	493	0	0	0	0	
Future Volume (vph)	0	0	0	0	224	408	360	493	0	0	0	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	12	12	12	12	12	12	14	12	12	12	12	12	
Total Lost time (s)					5.7		5.5	5.5					
Lane Util. Factor					0.91		0.91	0.91					
Flt					0.90		1.00	1.00					
Flt Protected					1.00		0.95	0.99					
Satd. Flow (prot)					4834		1808	3543					
Flt Permitted					1.00		0.95	0.99					
Satd. Flow (perm)					4834		1808	3543					
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	0	243	443	391	536	0	0	0	0	
RTOR Reduction (vph)	0	0	0	0	292	0	90	16	0	0	0	0	
Lane Group Flow (vph)	0	0	0	0	394	0	211	610	0	0	0	0	
Turn Type					NA		Split	NA					
Protected Phases					6		5	5					
Permitted Phases													
Actuated Green, G (s)					17.3		51.5	51.5					
Effective Green, g (s)					17.3		51.5	51.5					
Actuated g/C Ratio					0.22		0.64	0.64					
Clearance Time (s)					5.7		5.5	5.5					
Lane Grp Cap (vph)					1045		1163	2280					
v/s Ratio Prot					c0.08		0.12	c0.17					
v/s Ratio Perm													
v/c Ratio					0.38		0.18	0.27					
Uniform Delay, d1					26.8		5.7	6.1					
Progression Factor					1.25		0.15	0.39					
Incremental Delay, d2					0.6		0.3	0.3					
Delay (s)					34.2		1.2	2.7					
Level of Service					C		A	A					
Approach Delay (s)		0.0			34.2			2.2			0.0		
Approach LOS		A			C			A			A		
Intersection Summary													
HCM 2000 Control Delay			15.8		HCM 2000 Level of Service				B				
HCM 2000 Volume to Capacity ratio			0.30										
Actuated Cycle Length (s)			80.0		Sum of lost time (s)				11.2				
Intersection Capacity Utilization			54.1%		ICU Level of Service				A				
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1904: SB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2032 Build ALT - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑								↘	↙↑	
Traffic Volume (vph)	0	405	287	0	0	0	0	0	0	395	287	0
Future Volume (vph)	0	405	287	0	0	0	0	0	0	395	287	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	11	11	11	12	12	12	12	12	12	16	14	14
Total Lost time (s)		5.8								5.5	5.5	
Lane Util. Factor		0.91								0.91	0.91	
Frt		0.94								1.00	1.00	
Flt Protected		1.00								0.95	0.98	
Satd. Flow (prot)		4852								1921	3736	
Flt Permitted		1.00								0.95	0.98	
Satd. Flow (perm)		4852								1921	3736	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	440	312	0	0	0	0	0	0	429	312	0
RTOR Reduction (vph)	0	160	0	0	0	0	0	0	0	31	31	0
Lane Group Flow (vph)	0	592	0	0	0	0	0	0	0	209	470	0
Turn Type		NA								Split	NA	
Protected Phases		12								11	11	
Permitted Phases												
Actuated Green, G (s)		18.2								50.5	50.5	
Effective Green, g (s)		18.2								50.5	50.5	
Actuated g/C Ratio		0.23								0.63	0.63	
Clearance Time (s)		5.8								5.5	5.5	
Lane Grp Cap (vph)		1103								1212	2358	
v/s Ratio Prot		c0.12								0.11	c0.13	
v/s Ratio Perm												
v/c Ratio		0.54								0.17	0.20	
Uniform Delay, d1		27.2								6.1	6.2	
Progression Factor		1.00								0.06	0.21	
Incremental Delay, d2		1.9								0.3	0.2	
Delay (s)		29.1								0.6	1.5	
Level of Service		C								A	A	
Approach Delay (s)		29.1			0.0			0.0			1.2	
Approach LOS		C			A			A			A	
Intersection Summary												
HCM 2000 Control Delay			15.2		HCM 2000 Level of Service						B	
HCM 2000 Volume to Capacity ratio			0.29									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)					11.3		
Intersection Capacity Utilization			35.3%		ICU Level of Service					A		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3945: NB M-1 [Woodward Ave] & Crossover/Site Driveway B

Project Panda
 2032 Build ALT - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑	↗		↑↑↑↑				
Traffic Volume (vph)	0	0	0	0	39	73	0	1096	93	0	0	0
Future Volume (vph)	0	0	0	0	39	73	0	1096	93	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	16	16	16	12	12	12	12	12	12
Total Lost time (s)					9.0	9.0		5.7				
Lane Util. Factor					1.00	1.00		0.81				
Fr _t					1.00	0.85		0.99				
Fl _t Protected					1.00	1.00		1.00				
Satd. Flow (prot)					2222	1889		7848				
Fl _t Permitted					1.00	1.00		1.00				
Satd. Flow (perm)					2222	1889		7848				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	42	79	0	1191	101	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	53	0	17	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	42	26	0	1275	0	0	0	0
Turn Type					NA	Perm		NA				
Protected Phases					4			2				
Permitted Phases						4						
Actuated Green, G (s)					23.0	23.0		52.3				
Effective Green, g (s)					23.0	23.0		52.3				
Actuated g/C Ratio					0.26	0.26		0.58				
Clearance Time (s)					9.0	9.0		5.7				
Lane Grp Cap (vph)					567	482		4560				
v/s Ratio Prot					c0.02			c0.16				
v/s Ratio Perm						0.01						
v/c Ratio					0.07	0.05		0.28				
Uniform Delay, d ₁					25.4	25.3		9.4				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d ₂					0.3	0.2		0.2				
Delay (s)					25.7	25.5		9.6				
Level of Service					C	C		A				
Approach Delay (s)		0.0			25.6			9.6			0.0	
Approach LOS		A			C			A			A	

Intersection Summary

HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.7
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3045: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 Build ALT - AM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶					↑↑↑↑
Traffic Volume (vph)	39	0	0	0	0	4172
Future Volume (vph)	39	0	0	0	0	4172
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	16	12	12	12	12	12
Total Lost time (s)	6.0					5.7
Lane Util. Factor	1.00					0.81
Fr _t	1.00					1.00
Fl _t Protected	0.95					1.00
Satd. Flow (prot)	2111					7941
Fl _t Permitted	0.95					1.00
Satd. Flow (perm)	2111					7941
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	0	0	0	0	4535
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	42	0	0	0	0	4535
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Actuated Green, G (s)	26.0					52.3
Effective Green, g (s)	26.0					52.3
Actuated g/C Ratio	0.29					0.58
Clearance Time (s)	6.0					5.7
Lane Grp Cap (vph)	609					4614
v/s Ratio Prot	c0.02					c0.57
v/s Ratio Perm						
v/c Ratio	0.07					0.98
Uniform Delay, d ₁	23.2					18.4
Progression Factor	0.00					1.00
Incremental Delay, d ₂	0.2					9.8
Delay (s)	0.3					28.2
Level of Service	A					C
Approach Delay (s)	0.3		0.0		28.2	
Approach LOS	A		A		C	

Intersection Summary

HCM 2000 Control Delay	28.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.7
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2944: NB M-1 [Woodward Ave] & Crossover/W State Fair Ave

Project Panda
 2032 Build ALT - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					←			↑↑↑↑				
Traffic Volume (vph)	0	0	0	0	105	172	0	1018	102	0	0	0
Future Volume (vph)	0	0	0	0	105	172	0	1018	102	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	16	16	16	13	13	13	12	12	11	12	12	12
Total Lost time (s)					8.8			5.2				
Lane Util. Factor					1.00			0.81				
Frbp, ped/bikes					0.99			1.00				
Flpb, ped/bikes					1.00			1.00				
Frt					0.92			0.99				
Flt Protected					1.00			1.00				
Satd. Flow (prot)					1827			7655				
Flt Permitted					1.00			1.00				
Satd. Flow (perm)					1827			7655				
Peak-hour factor, PHF	0.63	0.63	0.63	0.90	0.90	0.90	0.92	0.92	0.92	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	0	117	191	0	1107	111	0	0	0
RTOR Reduction (vph)	0	0	0	0	49	0	0	15	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	259	0	0	1203	0	0	0	0
Confl. Peds. (#/hr)	5						5		23	23		
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	4%	0%	4%	4%	0%	0%	0%
Turn Type					NA			NA				
Protected Phases					4			2				
Permitted Phases												
Actuated Green, G (s)					28.2			77.8				
Effective Green, g (s)					28.2			77.8				
Actuated g/C Ratio					0.23			0.65				
Clearance Time (s)					8.8			5.2				
Lane Grp Cap (vph)					429			4962				
v/s Ratio Prot					c0.14			c0.16				
v/s Ratio Perm												
v/c Ratio					0.60			0.24				
Uniform Delay, d1					40.9			8.8				
Progression Factor					1.00			1.00				
Incremental Delay, d2					6.2			0.1				
Delay (s)					47.1			8.9				
Level of Service					D			A				
Approach Delay (s)		0.0			47.1			8.9			0.0	
Approach LOS		A			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			16.6		HCM 2000 Level of Service				B			
HCM 2000 Volume to Capacity ratio			0.34									
Actuated Cycle Length (s)			120.0		Sum of lost time (s)				14.0			
Intersection Capacity Utilization			63.9%		ICU Level of Service				B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 2044: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 Build ALT - AM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↵					↑↑↑↑
Traffic Volume (vph)	105	0	0	0	0	4211
Future Volume (vph)	105	0	0	0	0	4211
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	16	16	12	12	10	12
Total Lost time (s)	5.8					5.2
Lane Util. Factor	1.00					0.81
Frbp, ped/bikes	1.00					1.00
Flpb, ped/bikes	1.00					1.00
Fr	1.00					1.00
Flt Protected	0.95					1.00
Satd. Flow (prot)	2153					8020
Flt Permitted	0.95					1.00
Satd. Flow (perm)	2153					8020
Peak-hour factor, PHF	0.90	0.90	0.92	0.92	0.63	0.95
Adj. Flow (vph)	117	0	0	0	0	4433
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	117	0	0	0	0	4433
Confl. Peds. (#/hr)	5	5		23	23	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Actuated Green, G (s)	31.2					77.8
Effective Green, g (s)	31.2					77.8
Actuated g/C Ratio	0.26					0.65
Clearance Time (s)	5.8					5.2
Lane Grp Cap (vph)	559					5199
v/s Ratio Prot	c0.05					c0.55
v/s Ratio Perm						
v/c Ratio	0.21					0.85
Uniform Delay, d1	34.7					16.6
Progression Factor	0.19					1.00
Incremental Delay, d2	0.6					1.9
Delay (s)	7.1					18.5
Level of Service	A					B
Approach Delay (s)	7.1		0.0			18.5
Approach LOS	A		A			B
Intersection Summary						
HCM 2000 Control Delay			18.2	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.69			
Actuated Cycle Length (s)			120.0	Sum of lost time (s)		14.0
Intersection Capacity Utilization			63.9%	ICU Level of Service		B
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

Project Panda

1404: SB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]/WB M-102 [8 Mile Srv Rd]



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations				↙	↕						↕	↘	
Traffic Volume (vph)	0	0	0	212	372	0	0	0	0	0	467	264	
Future Volume (vph)	0	0	0	212	372	0	0	0	0	0	467	264	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	12	14	12	14	9	12	12	12	12	12	11	13	
Total Lost time (s)				5.6	5.6						5.7		
Lane Util. Factor				0.91	0.91						0.91		
Fr _t				1.00	1.00						0.95		
Fl _t Protected				0.95	1.00						1.00		
Satd. Flow (prot)				1808	3202						4894		
Fl _t Permitted				0.95	1.00						1.00		
Satd. Flow (perm)				1808	3202						4894		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	230	404	0	0	0	0	0	508	287	
RTOR Reduction (vph)	0	0	0	21	14	0	0	0	0	0	128	0	
Lane Group Flow (vph)	0	0	0	184	415	0	0	0	0	0	667	0	
Turn Type				Split	NA						NA		
Protected Phases				10	10						9		
Permitted Phases													
Actuated Green, G (s)				50.4	50.4						18.3		
Effective Green, g (s)				50.4	50.4						18.3		
Actuated g/C Ratio				0.63	0.63						0.23		
Clearance Time (s)				5.6	5.6						5.7		
Lane Grp Cap (vph)				1139	2017						1119		
v/s Ratio Prot				0.10	c0.13						c0.14		
v/s Ratio Perm													
v/c Ratio				0.16	0.21						0.60		
Uniform Delay, d ₁				6.1	6.3						27.5		
Progression Factor				0.95	0.94						1.00		
Incremental Delay, d ₂				0.3	0.2						2.3		
Delay (s)				6.1	6.1						29.9		
Level of Service				A	A						C		
Approach Delay (s)		0.0			6.1			0.0			29.9		
Approach LOS		A			A			A			C		
Intersection Summary													
HCM 2000 Control Delay			19.3		HCM 2000 Level of Service						B		
HCM 2000 Volume to Capacity ratio			0.31										
Actuated Cycle Length (s)			80.0		Sum of lost time (s)					11.3			
Intersection Capacity Utilization			35.3%		ICU Level of Service					A			
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1804: NB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2032 Build ALT - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↖↗						↖↗↘				
Traffic Volume (vph)	379	422	0	0	0	0	0	475	197	0	0	0
Future Volume (vph)	379	422	0	0	0	0	0	475	197	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	14	9	9	12	12	12	11	11	11	12	12	12
Total Lost time (s)	5.4	5.4						5.7				
Lane Util. Factor	0.91	0.91						0.91				
Frt	1.00	1.00						0.96				
Flt Protected	0.95	0.99						1.00				
Satd. Flow (prot)	1808	3177						4947				
Flt Permitted	0.95	0.99						1.00				
Satd. Flow (perm)	1808	3177						4947				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	412	459	0	0	0	0	0	516	214	0	0	0
RTOR Reduction (vph)	19	19	0	0	0	0	0	93	0	0	0	0
Lane Group Flow (vph)	265	568	0	0	0	0	0	637	0	0	0	0
Turn Type	Split	NA						NA				
Protected Phases	2	2						1				
Permitted Phases												
Actuated Green, G (s)	50.6	50.6						18.3				
Effective Green, g (s)	50.6	50.6						18.3				
Actuated g/C Ratio	0.63	0.63						0.23				
Clearance Time (s)	5.4	5.4						5.7				
Lane Grp Cap (vph)	1143	2009						1131				
v/s Ratio Prot	0.15	c0.18						c0.13				
v/s Ratio Perm												
v/c Ratio	0.23	0.28						0.56				
Uniform Delay, d1	6.3	6.6						27.3				
Progression Factor	0.49	0.52						1.00				
Incremental Delay, d2	0.4	0.3						2.0				
Delay (s)	3.5	3.8						29.3				
Level of Service	A	A						C				
Approach Delay (s)		3.7			0.0			29.3			0.0	
Approach LOS		A			A			C			A	
Intersection Summary												
HCM 2000 Control Delay			15.4					HCM 2000 Level of Service			B	
HCM 2000 Volume to Capacity ratio			0.36									
Actuated Cycle Length (s)			80.0					Sum of lost time (s)		11.2		
Intersection Capacity Utilization			47.4%					ICU Level of Service		A		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2915: Market Place Dr/Crossover & EB M-102 [8 Mile Rd]

Project Panda
 2032 Build ALT - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑↑↑	↗						↖↖	↘	↑		
Traffic Volume (vph)	0	2492	55	0	0	0	0	0	56	234	67	0	
Future Volume (vph)	0	2492	55	0	0	0	0	0	56	234	67	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	12	12	14	12	12	12	12	12	11	16	16	16	
Total Lost time (s)		6.2	6.2						6.0	6.0	6.0		
Lane Util. Factor		0.81	1.00						0.88	1.00	1.00		
Frt		1.00	0.85						0.85	1.00	1.00		
Flt Protected		1.00	1.00						1.00	0.95	1.00		
Satd. Flow (prot)		7941	1778						2836	2111	2222		
Flt Permitted		1.00	1.00						1.00	0.95	1.00		
Satd. Flow (perm)		7941	1778						2836	2111	2222		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	2709	60	0	0	0	0	0	61	254	73	0	
RTOR Reduction (vph)	0	0	20	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	2709	40	0	0	0	0	0	61	254	73	0	
Turn Type		NA	Prot						Prot	Split	NA		
Protected Phases		2 10	2 10						3	12	12		
Permitted Phases													
Actuated Green, G (s)		107.5	107.5						7.6	20.5	20.5		
Effective Green, g (s)		107.5	107.5						7.6	20.5	20.5		
Actuated g/C Ratio		0.67	0.67						0.05	0.13	0.13		
Clearance Time (s)									6.0	6.0	6.0		
Vehicle Extension (s)									3.0	3.0	3.0		
Lane Grp Cap (vph)		5335	1194						134	270	284		
v/s Ratio Prot		c0.34	0.02						c0.02	c0.12	0.03		
v/s Ratio Perm													
v/c Ratio		0.51	0.03						0.46	0.94	0.26		
Uniform Delay, d1		13.1	8.8						74.2	69.1	62.9		
Progression Factor		1.01	0.99						1.00	1.13	1.12		
Incremental Delay, d2		0.1	0.0						2.4	28.0	0.3		
Delay (s)		13.3	8.7						76.6	106.5	70.7		
Level of Service		B	A						E	F	E		
Approach Delay (s)		13.2			0.0			76.6			98.5		
Approach LOS		B			A			E			F		
Intersection Summary													
HCM 2000 Control Delay			23.3									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.57										
Actuated Cycle Length (s)			160.0									Sum of lost time (s)	24.4
Intersection Capacity Utilization			89.2%									ICU Level of Service	E
Analysis Period (min)			15										
c Critical Lane Group													



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	4172
Future Volume (vph)	0	0	0	0	0	4172
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Satd. Flow (prot)	2222	0	0	0	0	7941
Flt Permitted						
Satd. Flow (perm)	2222	0	0	0	0	7941
Link Speed (mph)	25		40			40
Link Distance (ft)	133		561			753
Travel Time (s)	3.6		9.6			12.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	4535
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.9%
ICU Level of Service	B
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Delays on the major and minor streets should be 0 seconds as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
 4946: NB M-1 [Woodward Ave] & Crossover/State Fair Gate #5

Project Panda
 2032 Build ALT - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↑↑↑↑				
Traffic Volume (vph)	0	0	0	0	0	0	0	1169	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	1169	0	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	12	12
Satd. Flow (prot)	0	0	0	0	2222	0	0	7941	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	2222	0	0	7941	0	0	0	0
Link Speed (mph)		25			25			40				40
Link Distance (ft)		133			938			540				202
Travel Time (s)		3.6			25.6			9.2				3.4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	1271	0	0	0	0
Sign Control		Free			Stop			Free				Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.9%
ICU Level of Service	B
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Delays on the major and minor streets should be 0 seconds as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

HCM Signalized Intersection Capacity Analysis
 1015: Crossover/Driveway & WB M-102 [8 Mile Rd]

Project Panda
 2032 Build ALT - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↗↘					↖
Traffic Volume (vph)	0	0	0	0	3010	4	314	0	0	0	0	12
Future Volume (vph)	0	0	0	0	3010	4	314	0	0	0	0	12
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	12	11	12	14	14	14	11	11	11
Total Lost time (s)					5.3		5.2					5.7
Lane Util. Factor					0.86		0.97					1.00
Frt					1.00		1.00					0.86
Flt Protected					1.00		0.95					1.00
Satd. Flow (prot)					6519		3855					1640
Flt Permitted					1.00		0.95					1.00
Satd. Flow (perm)					6519		3855					1640
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	3272	4	341	0	0	0	0	13
RTOR Reduction (vph)	0	0	0	0	0	0	298	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	3276	0	43	0	0	0	0	13
Turn Type					NA		Prot					Prot
Protected Phases					6		3					4
Permitted Phases												
Actuated Green, G (s)					52.3		10.0					1.5
Effective Green, g (s)					52.3		10.0					1.5
Actuated g/C Ratio					0.65		0.12					0.02
Clearance Time (s)					5.3		5.2					5.7
Vehicle Extension (s)					3.0		3.0					3.0
Lane Grp Cap (vph)					4261		481					30
v/s Ratio Prot					c0.50		c0.01					c0.01
v/s Ratio Perm												
v/c Ratio					0.77		0.09					0.43
Uniform Delay, d1					9.6		31.0					38.8
Progression Factor					1.00		4.54					1.00
Incremental Delay, d2					1.4		0.1					9.7
Delay (s)					11.0		140.6					48.6
Level of Service					B		F					D
Approach Delay (s)		0.0			11.0			140.6			48.6	
Approach LOS		A			B			F			D	
Intersection Summary												
HCM 2000 Control Delay			23.3		HCM 2000 Level of Service					C		
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)				16.2			
Intersection Capacity Utilization			100.8%		ICU Level of Service				G			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 1704: NB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]

Project Panda
 2032 Build ALT - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↑↑↑		↑	↑↑					
Traffic Volume (vph)	0	0	0	0	178	482	555	638	0	0	0	0	
Future Volume (vph)	0	0	0	0	178	482	555	638	0	0	0	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	12	12	12	12	12	12	14	12	12	12	12	12	
Total Lost time (s)					5.7		5.5	5.5					
Lane Util. Factor					0.91		0.91	0.91					
Fr _t					0.89		1.00	1.00					
Fl _t Protected					1.00		0.95	0.99					
Satd. Flow (prot)					4766		1808	3532					
Fl _t Permitted					1.00		0.95	0.99					
Satd. Flow (perm)					4766		1808	3532					
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	0	193	524	603	693	0	0	0	0	
RTOR Reduction (vph)	0	0	0	0	211	0	122	27	0	0	0	0	
Lane Group Flow (vph)	0	0	0	0	506	0	300	847	0	0	0	0	
Turn Type					NA		Split	NA					
Protected Phases					6		5	5					
Permitted Phases													
Actuated Green, G (s)					17.3		51.5	51.5					
Effective Green, g (s)					17.3		51.5	51.5					
Actuated g/C Ratio					0.22		0.64	0.64					
Clearance Time (s)					5.7		5.5	5.5					
Lane Grp Cap (vph)					1030		1163	2273					
v/s Ratio Prot					c0.11		0.17	c0.24					
v/s Ratio Perm													
v/c Ratio					0.91dr		0.26	0.37					
Uniform Delay, d ₁					27.5		6.1	6.7					
Progression Factor					1.06		0.01	0.22					
Incremental Delay, d ₂					1.2		0.4	0.4					
Delay (s)					30.4		0.5	1.9					
Level of Service					C		A	A					
Approach Delay (s)		0.0			30.4			1.4			0.0		
Approach LOS		A			C			A			A		
Intersection Summary													
HCM 2000 Control Delay			11.7		HCM 2000 Level of Service				B				
HCM 2000 Volume to Capacity ratio			0.40										
Actuated Cycle Length (s)			80.0		Sum of lost time (s)				11.2				
Intersection Capacity Utilization			62.4%		ICU Level of Service				B				
Analysis Period (min)			15										
dr Defacto Right Lane. Recode with 1 though lane as a right lane.													
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
 1904: SB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2032 Build ALT - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑↑								↘	↙↑		
Traffic Volume (vph)	0	492	193	0	0	0	0	0	0	466	274	0	
Future Volume (vph)	0	492	193	0	0	0	0	0	0	466	274	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	11	11	11	12	12	12	12	12	12	16	14	14	
Total Lost time (s)		5.8								5.5	5.5		
Lane Util. Factor		0.91								0.91	0.91		
Frt		0.96								1.00	1.00		
Flt Protected		1.00								0.95	0.98		
Satd. Flow (prot)		4956								1921	3723		
Flt Permitted		1.00								0.95	0.98		
Satd. Flow (perm)		4956								1921	3723		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	535	210	0	0	0	0	0	0	507	298	0	
RTOR Reduction (vph)	0	88	0	0	0	0	0	0	0	17	17	0	
Lane Group Flow (vph)	0	657	0	0	0	0	0	0	0	247	524	0	
Turn Type		NA								Split	NA		
Protected Phases		12								11	11		
Permitted Phases													
Actuated Green, G (s)		18.2								50.5	50.5		
Effective Green, g (s)		18.2								50.5	50.5		
Actuated g/C Ratio		0.23								0.63	0.63		
Clearance Time (s)		5.8								5.5	5.5		
Lane Grp Cap (vph)		1127								1212	2350		
v/s Ratio Prot		c0.13								0.13	c0.14		
v/s Ratio Perm													
v/c Ratio		0.58								0.20	0.22		
Uniform Delay, d1		27.5								6.2	6.3		
Progression Factor		1.00								0.14	0.21		
Incremental Delay, d2		2.2								0.3	0.2		
Delay (s)		29.7								1.2	1.5		
Level of Service		C								A	A		
Approach Delay (s)		29.7			0.0			0.0			1.4		
Approach LOS		C			A			A			A		
Intersection Summary													
HCM 2000 Control Delay			15.0		HCM 2000 Level of Service						B		
HCM 2000 Volume to Capacity ratio			0.32										
Actuated Cycle Length (s)			80.0		Sum of lost time (s)					11.3			
Intersection Capacity Utilization			38.8%		ICU Level of Service					A			
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3945: NB M-1 [Woodward Ave] & Crossover/Site Driveway B

Project Panda
 2032 Build ALT - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑	↗		↑↑↑↑				
Traffic Volume (vph)	0	0	0	0	72	161	0	4006	64	0	0	0
Future Volume (vph)	0	0	0	0	72	161	0	4006	64	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	12	12	16	16	16	12	12	12	12	12	12
Total Lost time (s)					9.0	9.0		5.7				
Lane Util. Factor					1.00	1.00		0.81				
Fr _t					1.00	0.85		1.00				
Fl _t Protected					1.00	1.00		1.00				
Satd. Flow (prot)					2222	1889		7922				
Fl _t Permitted					1.00	1.00		1.00				
Satd. Flow (perm)					2222	1889		7922				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	78	175	0	4354	70	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	22	0	3	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	78	153	0	4421	0	0	0	0
Turn Type					NA	Perm		NA				
Protected Phases					4			2				
Permitted Phases						4						
Actuated Green, G (s)					23.0	23.0		62.3				
Effective Green, g (s)					23.0	23.0		62.3				
Actuated g/C Ratio					0.23	0.23		0.62				
Clearance Time (s)					9.0	9.0		5.7				
Lane Grp Cap (vph)					511	434		4935				
v/s Ratio Prot					0.04			c0.56				
v/s Ratio Perm						c0.08						
v/c Ratio					0.15	0.35		0.90				
Uniform Delay, d ₁					30.7	32.3		16.1				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d ₂					0.6	2.2		3.0				
Delay (s)					31.4	34.5		19.0				
Level of Service					C	C		B				
Approach Delay (s)		0.0			33.5			19.0			0.0	
Approach LOS		A			C			B			A	

Intersection Summary

HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.7
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 3045: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 Build ALT - PM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶					↑↑↑↑
Traffic Volume (vph)	72	0	0	0	0	1695
Future Volume (vph)	72	0	0	0	0	1695
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	16	12	12	12	12	12
Total Lost time (s)	6.0					5.7
Lane Util. Factor	1.00					0.81
Frt	1.00					1.00
Flt Protected	0.95					1.00
Satd. Flow (prot)	2111					7941
Flt Permitted	0.95					1.00
Satd. Flow (perm)	2111					7941
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	78	0	0	0	0	1842
RTOR Reduction (vph)	14	0	0	0	0	0
Lane Group Flow (vph)	64	0	0	0	0	1842
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Actuated Green, G (s)	26.0					62.3
Effective Green, g (s)	26.0					62.3
Actuated g/C Ratio	0.26					0.62
Clearance Time (s)	6.0					5.7
Lane Grp Cap (vph)	548					4947
v/s Ratio Prot	c0.03					c0.23
v/s Ratio Perm						
v/c Ratio	0.12					0.37
Uniform Delay, d1	28.2					9.3
Progression Factor	0.00					1.00
Incremental Delay, d2	0.4					0.2
Delay (s)	0.6					9.5
Level of Service	A					A
Approach Delay (s)	0.6		0.0		9.5	
Approach LOS	A		A		A	

Intersection Summary

HCM 2000 Control Delay	9.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.7
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2944: NB M-1 [Woodward Ave] & Crossover/W State Fair Ave

Project Panda
 2032 Build ALT - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					←			↑↑↑↑				
Traffic Volume (vph)	0	0	0	0	133	181	0	3890	113	0	0	0
Future Volume (vph)	0	0	0	0	133	181	0	3890	113	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	16	16	16	13	13	13	12	12	11	12	12	12
Total Lost time (s)					8.8			5.2				
Lane Util. Factor					1.00			0.81				
Frbp, ped/bikes					0.99			1.00				
Flpb, ped/bikes					1.00			1.00				
Frt					0.92			1.00				
Flt Protected					1.00			1.00				
Satd. Flow (prot)					1823			7980				
Flt Permitted					1.00			1.00				
Satd. Flow (perm)					1823			7980				
Peak-hour factor, PHF	0.50	0.50	0.50	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	0	143	195	0	4095	119	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	338	0	0	4210	0	0	0	0
Confl. Peds. (#/hr)	5						5		23	23		
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	1%	1%	5%	0%	1%	0%	0%	0%	0%
Turn Type					NA			NA				
Protected Phases					4			2				
Permitted Phases												
Actuated Green, G (s)					22.2			83.8				
Effective Green, g (s)					22.2			83.8				
Actuated g/C Ratio					0.18			0.70				
Clearance Time (s)					8.8			5.2				
Lane Grp Cap (vph)					337			5572				
v/s Ratio Prot					c0.19			c0.53				
v/s Ratio Perm												
v/c Ratio					1.00			0.76				
Uniform Delay, d1					48.9			11.6				
Progression Factor					1.00			1.00				
Incremental Delay, d2					49.8			1.0				
Delay (s)					98.7			12.5				
Level of Service					F			B				
Approach Delay (s)		0.0			98.7			12.5			0.0	
Approach LOS		A			F			B			A	
Intersection Summary												
HCM 2000 Control Delay			18.9					HCM 2000 Level of Service		B		
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			120.0					Sum of lost time (s)		14.0		
Intersection Capacity Utilization			73.5%					ICU Level of Service		D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 2044: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 Build ALT - PM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↵					↑↑↑↑
Traffic Volume (vph)	133	0	0	0	0	1765
Future Volume (vph)	133	0	0	0	0	1765
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	16	16	12	12	10	12
Total Lost time (s)	5.8					5.2
Lane Util. Factor	1.00					0.81
Frpb, ped/bikes	1.00					1.00
Flpb, ped/bikes	1.00					1.00
Fr _t	1.00					1.00
Fl _t Protected	0.95					1.00
Satd. Flow (prot)	2132					7941
Fl _t Permitted	0.95					1.00
Satd. Flow (perm)	2132					7941
Peak-hour factor, PHF	0.95	0.95	0.92	0.92	0.50	0.95
Adj. Flow (vph)	140	0	0	0	0	1858
RTOR Reduction (vph)	21	0	0	0	0	0
Lane Group Flow (vph)	119	0	0	0	0	1858
Confl. Peds. (#/hr)	5	5		23	23	
Heavy Vehicles (%)	1%	0%	0%	0%	0%	2%
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Actuated Green, G (s)	25.2					83.8
Effective Green, g (s)	25.2					83.8
Actuated g/C Ratio	0.21					0.70
Clearance Time (s)	5.8					5.2
Lane Grp Cap (vph)	447					5545
v/s Ratio Prot	c0.06					c0.23
v/s Ratio Perm						
v/c Ratio	0.27					0.34
Uniform Delay, d1	39.7					7.1
Progression Factor	0.00					1.00
Incremental Delay, d2	0.1					0.2
Delay (s)	0.1					7.3
Level of Service	A					A
Approach Delay (s)	0.1		0.0		7.3	
Approach LOS	A		A		A	
Intersection Summary						
HCM 2000 Control Delay			6.8		HCM 2000 Level of Service A	
HCM 2000 Volume to Capacity ratio			0.33			
Actuated Cycle Length (s)			120.0		Sum of lost time (s) 14.0	
Intersection Capacity Utilization			73.5%		ICU Level of Service D	
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

Project Panda

1404: SB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]/WB M-102 [8 Mile Srv Rd] / SB M-102 [8 Mile Srv Rd]



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↙	↕						↕	↘
Traffic Volume (vph)	0	0	0	208	525	0	0	0	0	0	532	311
Future Volume (vph)	0	0	0	208	525	0	0	0	0	0	532	311
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	12	14	12	14	9	12	12	12	12	12	11	13
Total Lost time (s)				5.6	5.6						5.7	
Lane Util. Factor				0.91	0.91						0.91	
Flt				1.00	1.00						0.94	
Flt Protected				0.95	1.00						1.00	
Satd. Flow (prot)				1808	3206						4888	
Flt Permitted				0.95	1.00						1.00	
Satd. Flow (perm)				1808	3206						4888	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	226	571	0	0	0	0	0	578	338
RTOR Reduction (vph)	0	0	0	14	14	0	0	0	0	0	132	0
Lane Group Flow (vph)	0	0	0	189	580	0	0	0	0	0	784	0
Turn Type				Split	NA							NA
Protected Phases				10	10							9
Permitted Phases												
Actuated Green, G (s)				50.4	50.4							18.3
Effective Green, g (s)				50.4	50.4							18.3
Actuated g/C Ratio				0.63	0.63							0.23
Clearance Time (s)				5.6	5.6							5.7
Lane Grp Cap (vph)				1139	2019							1118
v/s Ratio Prot				0.10	c0.18							c0.16
v/s Ratio Perm												
v/c Ratio				0.17	0.29							0.70
Uniform Delay, d1				6.1	6.7							28.3
Progression Factor				0.69	0.70							1.00
Incremental Delay, d2				0.3	0.3							3.7
Delay (s)				4.5	5.0							32.0
Level of Service				A	A							C
Approach Delay (s)		0.0			4.9			0.0				32.0
Approach LOS		A			A			A				C
Intersection Summary												
HCM 2000 Control Delay			19.4		HCM 2000 Level of Service						B	
HCM 2000 Volume to Capacity ratio			0.40									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)				11.3			
Intersection Capacity Utilization			38.8%		ICU Level of Service				A			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1804: NB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

Project Panda
 2032 Build ALT - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↔↗						↕↗↘				
Traffic Volume (vph)	428	530	0	0	0	0	0	766	170	0	0	0
Future Volume (vph)	428	530	0	0	0	0	0	766	170	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	14	9	9	12	12	12	11	11	11	12	12	12
Total Lost time (s)	5.4	5.4						5.7				
Lane Util. Factor	0.91	0.91						0.91				
Frt	1.00	1.00						0.97				
Flt Protected	0.95	0.99						1.00				
Satd. Flow (prot)	1808	3183						5033				
Flt Permitted	0.95	0.99						1.00				
Satd. Flow (perm)	1808	3183						5033				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	465	576	0	0	0	0	0	833	185	0	0	0
RTOR Reduction (vph)	14	14	0	0	0	0	0	44	0	0	0	0
Lane Group Flow (vph)	325	688	0	0	0	0	0	974	0	0	0	0
Turn Type	Split	NA						NA				
Protected Phases	2	2						1				
Permitted Phases												
Actuated Green, G (s)	50.6	50.6						18.3				
Effective Green, g (s)	50.6	50.6						18.3				
Actuated g/C Ratio	0.63	0.63						0.23				
Clearance Time (s)	5.4	5.4						5.7				
Lane Grp Cap (vph)	1143	2013						1151				
v/s Ratio Prot	0.18	c0.22						c0.19				
v/s Ratio Perm												
v/c Ratio	0.28	0.34						0.85				
Uniform Delay, d1	6.6	6.9						29.5				
Progression Factor	0.51	0.51						1.00				
Incremental Delay, d2	0.6	0.4						7.7				
Delay (s)	3.9	3.9						37.2				
Level of Service	A	A						D				
Approach Delay (s)		3.9			0.0			37.2			0.0	
Approach LOS		A			A			D			A	

Intersection Summary

HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	11.2
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2915: Market Place Dr/Crossover & EB M-102 [8 Mile Rd]

Project Panda
 2032 Build ALT - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑↑↑	↗						↖↖	↘	↑		
Traffic Volume (vph)	0	2930	119	0	0	0	0	0	210	151	115	0	
Future Volume (vph)	0	2930	119	0	0	0	0	0	210	151	115	0	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Lane Width	12	12	14	12	12	12	12	12	11	16	16	16	
Total Lost time (s)		6.2	6.2						6.0	6.0	6.0		
Lane Util. Factor		0.81	1.00						0.88	1.00	1.00		
Fr _t		1.00	0.85						0.85	1.00	1.00		
Fl _t Protected		1.00	1.00						1.00	0.95	1.00		
Satd. Flow (prot)		7941	1778						2836	2111	2222		
Fl _t Permitted		1.00	1.00						1.00	0.95	1.00		
Satd. Flow (perm)		7941	1778						2836	2111	2222		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	3185	129	0	0	0	0	0	228	164	125	0	
RTOR Reduction (vph)	0	0	42	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	3185	87	0	0	0	0	0	228	164	125	0	
Turn Type		NA	Prot						Prot	Split	NA		
Protected Phases		2 10	2 10						3	12	12		
Permitted Phases													
Actuated Green, G (s)		107.7	107.7						14.0	13.9	13.9		
Effective Green, g (s)		107.7	107.7						14.0	13.9	13.9		
Actuated g/C Ratio		0.67	0.67						0.09	0.09	0.09		
Clearance Time (s)									6.0	6.0	6.0		
Vehicle Extension (s)									3.0	3.0	3.0		
Lane Grp Cap (vph)		5345	1196						248	183	193		
v/s Ratio Prot		c0.40	0.05						c0.08	c0.08	0.06		
v/s Ratio Perm													
v/c Ratio		0.60	0.07						0.92	0.90	0.65		
Uniform Delay, d ₁		14.3	9.0						72.4	72.3	70.7		
Progression Factor		0.97	1.21						1.00	0.91	0.90		
Incremental Delay, d ₂		0.2	0.0						35.7	30.7	5.4		
Delay (s)		14.1	10.9						108.1	96.4	68.8		
Level of Service		B	B						F	F	E		
Approach Delay (s)		14.0			0.0			108.1			84.5		
Approach LOS		B			A			F			F		
Intersection Summary													
HCM 2000 Control Delay			24.9									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.66										
Actuated Cycle Length (s)			160.0									Sum of lost time (s)	24.4
Intersection Capacity Utilization			92.5%									ICU Level of Service	F
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
 4046: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 Build ALT - PM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔					↑↑↑↑
Traffic Volume (vph)	0	0	0	0	0	1695
Future Volume (vph)	0	0	0	0	0	1695
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Satd. Flow (prot)	2222	0	0	0	0	7941
Flt Permitted						
Satd. Flow (perm)	2222	0	0	0	0	7941
Link Speed (mph)	25		40			40
Link Distance (ft)	107		492			822
Travel Time (s)	2.9		8.4			14.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	1842
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.9%
ICU Level of Service	B
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Delays on the major and minor streets should be 0 seconds as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.

Lanes, Volumes, Timings
 4946: NB M-1 [Woodward Ave] & Crossover/State Fair Gate #5

Project Panda
 2032 Build ALT - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↑↑↑↑				
Traffic Volume (vph)	0	0	0	0	0	0	0	4167	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	4167	0	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	12	12
Satd. Flow (prot)	0	0	0	0	2222	0	0	7941	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	2222	0	0	7941	0	0	0	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		107			965			473			267	
Travel Time (s)		2.9			26.3			8.1			4.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	0	4529	0	0	0	0
Sign Control		Free			Stop			Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.9%
ICU Level of Service	B
Analysis Period (min)	15

HCM reports could not be printed due to intersection lane geometry so Synchro reports were used instead. Delays on the major and minor streets should be 0 seconds as the intersection uses a signal set to flash and there are no vehicles entering or exiting the adjacent parking lot during a typical AM or PM peak hour period.



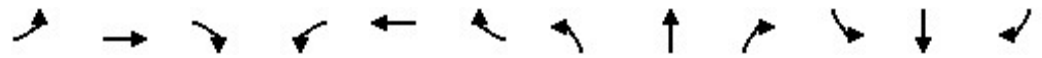
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	14	12	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	325		275	0		0	0		0	0		0
Storage Lanes	2		0	0		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		40			40			25				25
Link Distance (ft)		677			2304			386				96
Travel Time (s)		11.5			39.3			10.5				2.6
Lane Group Flow (vph)	158	2866	0	0	0	0	0	0	63	0	0	0

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 1015: Crossover/Driveway & WB M-102 [8 Mile Rd]

Project Panda
 2032 Build ALT - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑↑		↘↘					↗
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	11	12	14	14	14	11	11	11
Storage Length (ft)	0		0	325		0	0		0	0		0
Storage Lanes	0		0	0		0	2		0	0		1
Taper Length (ft)	25			100			25			25		
Right Turn on Red			Yes			Yes	Yes		Yes			No
Link Speed (mph)		40			40			25				25
Link Distance (ft)		682			2329			96				286
Travel Time (s)		11.6			39.7			2.6				7.8
Lane Group Flow (vph)	0	0	0	0	3737	0	158	0	0	0	0	4
v/c Ratio					0.81		0.19					0.03
Control Delay					11.0		1.2					34.0
Queue Delay					0.0		0.0					0.0
Total Delay					11.0		1.2					34.0
Queue Length 50th (ft)					257		1					2
Queue Length 95th (ft)					#635		m5					11
Internal Link Dist (ft)		602			2249			16				206
Turn Bay Length (ft)												
Base Capacity (vph)					4638		862					211
Starvation Cap Reductn					0		0					0
Spillback Cap Reductn					0		0					0
Storage Cap Reductn					0		0					0
Reduced v/c Ratio					0.81		0.18					0.02

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings

1704: NB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]

2032 Build ALT - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↑	↑↑				
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	12	12	14	12	12	12	12	12
Storage Length (ft)	0		0	875		0	90		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		174			1335			234				818
Travel Time (s)		3.0			22.8			4.0				13.9
Lane Group Flow (vph)	0	0	0	0	686	0	301	626	0	0	0	0
v/c Ratio					0.51		0.24	0.27				
Control Delay					16.2		0.6	2.5				
Queue Delay					0.0		0.6	0.5				
Total Delay					16.2		1.2	3.0				
Queue Length 50th (ft)					41		2	30				
Queue Length 95th (ft)					100		4	34				
Internal Link Dist (ft)		94			1255			154				738
Turn Bay Length (ft)							90					
Base Capacity (vph)					1336		1253	2297				
Starvation Cap Reductn					0		608	1168				
Spillback Cap Reductn					0		0	0				
Storage Cap Reductn					0		0	0				
Reduced v/c Ratio					0.51		0.47	0.55				

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings

1904: SB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑								↘	↙↑	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	11	11	11	12	12	12	12	12	12	16	14	14
Storage Length (ft)	0		900	0		0	0		0	90		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		1309			166			808				245
Travel Time (s)		22.3			2.8			13.8				4.2
Lane Group Flow (vph)	0	752	0	0	0	0	0	0	0	240	501	0
v/c Ratio		0.59								0.19	0.21	
Control Delay		21.9								0.5	1.3	
Queue Delay		0.0								0.7	0.4	
Total Delay		21.9								1.3	1.7	
Queue Length 50th (ft)		87								1	9	
Queue Length 95th (ft)		127								1	9	
Internal Link Dist (ft)		1229			86			728				165
Turn Bay Length (ft)										90		
Base Capacity (vph)		1264								1243	2387	
Starvation Cap Reductn		0								713	1362	
Spillback Cap Reductn		0								0	0	
Storage Cap Reductn		0								0	0	
Reduced v/c Ratio		0.59								0.45	0.49	

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 3945: NB M-1 [Woodward Ave] & Crossover/Site Driveway B

Project Panda
 2032 Build ALT - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑	↗		↑↑↑↑				
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	16	16	16	12	12	12	12	12	12
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		30			25			40				40
Link Distance (ft)		98			1019			383				540
Travel Time (s)		2.2			27.8			6.5				9.2
Lane Group Flow (vph)	0	0	0	0	42	79	0	1292	0	0	0	0
v/c Ratio					0.07	0.15		0.28				
Control Delay					26.0	8.8		9.3				
Queue Delay					0.0	0.0		0.0				
Total Delay					26.0	8.8		9.3				
Queue Length 50th (ft)					18	3		80				
Queue Length 95th (ft)					43	37		97				
Internal Link Dist (ft)		18			939			303				460
Turn Bay Length (ft)												
Base Capacity (vph)					567	535		4576				
Starvation Cap Reductn					0	0		0				
Spillback Cap Reductn					0	0		0				
Storage Cap Reductn					0	0		0				
Reduced v/c Ratio					0.07	0.15		0.28				

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 3045: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 Build ALT - AM Peak Hour



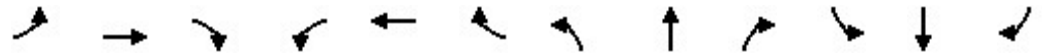
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Right Turn on Red	Yes	Yes		Yes		
Link Speed (mph)	25		40			40
Link Distance (ft)	98		813			561
Travel Time (s)	2.7		13.9			9.6
Lane Group Flow (vph)	42	0	0	0	0	4535
v/c Ratio	0.07					0.98
Control Delay	0.3					28.9
Queue Delay	0.0					0.0
Total Delay	0.3					28.9
Queue Length 50th (ft)	0					575
Queue Length 95th (ft)	0					#664
Internal Link Dist (ft)	18		733			481
Turn Bay Length (ft)						
Base Capacity (vph)	609					4614
Starvation Cap Reductn	0					0
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.07					0.98

Intersection Summary

Area Type: Other
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
 2944: NB M-1 [Woodward Ave] & Crossover/W State Fair Ave

Project Panda
 2032 Build ALT - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	16	16	13	13	13	12	12	11	12	12	12
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		25			25			40				40
Link Distance (ft)		76			457			1032				459
Travel Time (s)		2.1			12.5			17.6				7.8
Lane Group Flow (vph)	0	0	0	0	308	0	0	1218	0	0	0	0
v/c Ratio					0.64			0.24				
Control Delay					39.5			8.6				
Queue Delay					0.0			0.0				
Total Delay					39.5			8.6				
Queue Length 50th (ft)					172			86				
Queue Length 95th (ft)					271			100				
Internal Link Dist (ft)		1			377			952				379
Turn Bay Length (ft)												
Base Capacity (vph)					478			4976				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			0				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.64			0.24				

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 2044: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 Build ALT - AM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	16	12	12	10	12
Storage Length (ft)	30	0		0	0	
Storage Lanes	0	0		0	0	
Taper Length (ft)	25				25	
Right Turn on Red	Yes	Yes		Yes		
Link Speed (mph)	25		40			40
Link Distance (ft)	76		1017			813
Travel Time (s)	2.1		17.3			13.9
Lane Group Flow (vph)	117	0	0	0	0	4433
v/c Ratio	0.21					0.85
Control Delay	7.2					18.8
Queue Delay	0.0					0.6
Total Delay	7.2					19.4
Queue Length 50th (ft)	14					616
Queue Length 95th (ft)	m16					646
Internal Link Dist (ft)	1		937			733
Turn Bay Length (ft)	30					
Base Capacity (vph)	559					5199
Starvation Cap Reductn	0					362
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.21					0.92

Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings

1404: SB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]/WB M-102 [8 Mile Srv Rd]



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	14	12	14	9	12	12	12	12	12	11	13
Storage Length (ft)	0		0	110		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		1243			174			245				469
Travel Time (s)		21.2			3.0			4.2				8.0
Lane Group Flow (vph)	0	0	0	205	429	0	0	0	0	0	795	0
v/c Ratio				0.18	0.21							0.64
Control Delay				4.5	5.6							24.5
Queue Delay				1.4	0.9							0.0
Total Delay				5.9	6.5							24.5
Queue Length 50th (ft)				28	39							103
Queue Length 95th (ft)				53	58							144
Internal Link Dist (ft)		1163			94			165				389
Turn Bay Length (ft)				110								
Base Capacity (vph)				1159	2030							1247
Starvation Cap Reductn				767	1278							0
Spillback Cap Reductn				0	0							0
Storage Cap Reductn				0	0							0
Reduced v/c Ratio				0.52	0.57							0.64

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings

1804: NB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

2032 Build ALT - AM Peak Hour



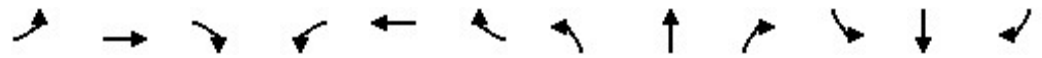
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	14	9	9	12	12	12	11	11	11	12	12	12
Storage Length (ft)	110		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		166			1036			1294				234
Travel Time (s)		2.8			17.7			22.1				4.0
Lane Group Flow (vph)	284	587	0	0	0	0	0	730	0	0	0	0
v/c Ratio	0.24	0.29						0.60				
Control Delay	3.0	3.5						25.1				
Queue Delay	1.5	0.9						0.0				
Total Delay	4.5	4.4						25.1				
Queue Length 50th (ft)	20	26						99				
Queue Length 95th (ft)	47	47						137				
Internal Link Dist (ft)		86			956			1214				154
Turn Bay Length (ft)	110											
Base Capacity (vph)	1163	2028						1224				
Starvation Cap Reductn	685	1099						0				
Spillback Cap Reductn	0	0						0				
Storage Cap Reductn	0	0						0				
Reduced v/c Ratio	0.59	0.63						0.60				

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 2915: Market Place Dr/Crossover & EB M-102 [8 Mile Rd]

Project Panda
 2032 Build ALT - AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑	↗						↖↖	↘	↑	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	14	12	12	12	12	12	11	16	16	16
Storage Length (ft)	0		280	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		2	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			No	No		Yes
Link Speed (mph)		40			40			25				40
Link Distance (ft)		349			677			533				92
Travel Time (s)		5.9			11.5			14.5				1.6
Lane Group Flow (vph)	0	2709	60	0	0	0	0	0	61	254	73	0
v/c Ratio		0.50	0.05						0.38	0.94	0.26	
Control Delay		7.7	0.9						79.4	102.4	77.3	
Queue Delay		0.0	0.0						0.0	0.0	0.0	
Total Delay		7.7	0.9						79.4	102.4	77.3	
Queue Length 50th (ft)		155	1						35	~359	81	
Queue Length 95th (ft)		155	m6						64	m#495	m102	
Internal Link Dist (ft)		269			597			453				12
Turn Bay Length (ft)			280									
Base Capacity (vph)		5584	1268						248	270	284	
Starvation Cap Reductn		0	0						0	0	0	
Spillback Cap Reductn		0	0						0	0	0	
Storage Cap Reductn		0	0						0	0	0	
Reduced v/c Ratio		0.49	0.05						0.25	0.94	0.26	

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	16	12	12	12
Storage Length (ft)		0	230		0	0
Storage Lanes		0	2		0	0
Taper Length (ft)			25		25	
Link Speed (mph)	40			40	40	
Link Distance (ft)	311			682	92	
Travel Time (s)	5.3			11.6	1.6	
Lane Group Flow (vph)	0	0	327	3558	0	0

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 1915: Site Driveway A/Crossover & 8 Mile Srv Rd (EB)

Project Panda
 2032 Build ALT - PM Peak Hour



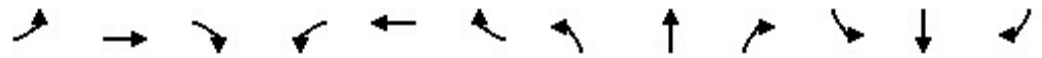
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	14	12	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	325		275	0		0	0		0	0		0
Storage Lanes	2		0	0		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		40			40			25				25
Link Distance (ft)		680			2304			449				96
Travel Time (s)		11.6			39.3			12.2				2.6
Lane Group Flow (vph)	341	3235	0	0	0	0	0	0	165	0	0	0

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
1015: Crossover/Driveway & WB M-102 [8 Mile Rd]

Project Panda
2032 Build ALT - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↘↘					↗
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	11	12	14	14	14	11	11	11
Storage Length (ft)	0		0	325		0	0		0	0		0
Storage Lanes	0		0	0		0	2		0	0		1
Taper Length (ft)	25			100			25			25		
Right Turn on Red			Yes			Yes	Yes		Yes			No
Link Speed (mph)		40			40			25				25
Link Distance (ft)		682			2329			96				286
Travel Time (s)		11.6			39.7			2.6				7.8
Lane Group Flow (vph)	0	0	0	0	3276	0	341	0	0	0	0	13
v/c Ratio					0.71		0.43					0.09
Control Delay					8.8		11.0					34.9
Queue Delay					0.0		0.0					0.0
Total Delay					8.8		11.0					34.9
Queue Length 50th (ft)					193		17					6
Queue Length 95th (ft)					427		m37					23
Internal Link Dist (ft)		602			2249			16				206
Turn Bay Length (ft)												
Base Capacity (vph)					4634		833					211
Starvation Cap Reductn					0		0					0
Spillback Cap Reductn					0		0					0
Storage Cap Reductn					0		0					0
Reduced v/c Ratio					0.71		0.41					0.06

Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings

1704: NB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]

2032 Build ALT - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↑	↑↑				
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	12	12	12	14	12	12	12	12	12
Storage Length (ft)	0		0	875		0	90		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		174			1335			234				818
Travel Time (s)		3.0			22.8			4.0				13.9
Lane Group Flow (vph)	0	0	0	0	717	0	422	874	0	0	0	0
v/c Ratio					0.91dr		0.33	0.38				
Control Delay					19.6		0.5	1.7				
Queue Delay					0.0		0.9	1.0				
Total Delay					19.6		1.4	2.7				
Queue Length 50th (ft)					45		1	21				
Queue Length 95th (ft)					111		m0	m27				
Internal Link Dist (ft)		94			1255			154				738
Turn Bay Length (ft)							90					
Base Capacity (vph)					1241		1286	2301				
Starvation Cap Reductn					0		573	1090				
Spillback Cap Reductn					0		0	0				
Storage Cap Reductn					0		0	0				
Reduced v/c Ratio					0.58		0.59	0.72				

Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lanes, Volumes, Timings

1904: SB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]

2032 Build ALT - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑								↘	↙↑	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	11	11	11	12	12	12	12	12	12	16	14	14
Storage Length (ft)	0		900	0		0	0		0	90		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		1292			166			808				245
Travel Time (s)		22.0			2.8			13.8				4.2
Lane Group Flow (vph)	0	745	0	0	0	0	0	0	0	264	541	0
v/c Ratio		0.61								0.21	0.23	
Control Delay		25.8								1.0	1.4	
Queue Delay		0.0								1.0	0.6	
Total Delay		25.8								2.0	2.0	
Queue Length 50th (ft)		103								5	10	
Queue Length 95th (ft)		142								9	12	
Internal Link Dist (ft)		1212			86			728				165
Turn Bay Length (ft)										90		
Base Capacity (vph)		1215								1229	2367	
Starvation Cap Reductn		0								713	1366	
Spillback Cap Reductn		0								0	0	
Storage Cap Reductn		0								0	0	
Reduced v/c Ratio		0.61								0.51	0.54	

Intersection Summary

Area Type:	Other
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Lanes, Volumes, Timings
 3945: NB M-1 [Woodward Ave] & Crossover/Site Driveway B

Project Panda
 2032 Build ALT - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑	↗		↑↑↑↑				
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	12	16	16	16	12	12	12	12	12	12
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		30			25			40				40
Link Distance (ft)		98			1019			451				473
Travel Time (s)		2.2			27.8			7.7				8.1
Lane Group Flow (vph)	0	0	0	0	78	175	0	4424	0	0	0	0
v/c Ratio					0.15	0.38		0.90				
Control Delay					31.8	29.8		19.3				
Queue Delay					0.0	0.0		0.0				
Total Delay					31.8	29.8		19.3				
Queue Length 50th (ft)					40	78		543				
Queue Length 95th (ft)					79	141		587				
Internal Link Dist (ft)		18			939			371				393
Turn Bay Length (ft)												
Base Capacity (vph)					511	456		4939				
Starvation Cap Reductn					0	0		0				
Spillback Cap Reductn					0	0		0				
Storage Cap Reductn					0	0		0				
Reduced v/c Ratio					0.15	0.38		0.90				

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 3045: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 Build ALT - PM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	12	12	12	12	12
Right Turn on Red	Yes	Yes		Yes		
Link Speed (mph)	25		40			40
Link Distance (ft)	98		411			492
Travel Time (s)	2.7		7.0			8.4
Lane Group Flow (vph)	78	0	0	0	0	1842
v/c Ratio	0.14					0.37
Control Delay	0.6					9.5
Queue Delay	0.0					0.0
Total Delay	0.6					9.5
Queue Length 50th (ft)	0					130
Queue Length 95th (ft)	0					149
Internal Link Dist (ft)	18		331			412
Turn Bay Length (ft)						
Base Capacity (vph)	562					4947
Starvation Cap Reductn	0					0
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.14					0.37

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings
 2944: NB M-1 [Woodward Ave] & Crossover/W State Fair Ave

Project Panda
 2032 Build ALT - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	16	16	13	13	13	12	12	11	12	12	12
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		25			25			40				40
Link Distance (ft)		76			772			1032				391
Travel Time (s)		2.1			21.1			17.6				6.7
Lane Group Flow (vph)	0	0	0	0	338	0	0	4214	0	0	0	0
v/c Ratio					1.00			0.76				
Control Delay					98.9			12.6				
Queue Delay					0.0			0.0				
Total Delay					98.9			12.6				
Queue Length 50th (ft)					~265			461				
Queue Length 95th (ft)					#460			486				
Internal Link Dist (ft)		1			692			952				311
Turn Bay Length (ft)												
Base Capacity (vph)					337			5578				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			0				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					1.00			0.76				

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
 2044: SB M-1 [Woodward Ave] & Crossover

Project Panda
 2032 Build ALT - PM Peak Hour



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	16	16	12	12	10	12
Storage Length (ft)	30	0		0	0	
Storage Lanes	0	0		0	0	
Taper Length (ft)	25				25	
Right Turn on Red	Yes	Yes		Yes		
Link Speed (mph)	25		40			40
Link Distance (ft)	76		1017			403
Travel Time (s)	2.1		17.3			6.9
Lane Group Flow (vph)	140	0	0	0	0	1858
v/c Ratio	0.30					0.34
Control Delay	0.2					7.3
Queue Delay	0.0					0.0
Total Delay	0.2					7.3
Queue Length 50th (ft)	0					125
Queue Length 95th (ft)	m0					140
Internal Link Dist (ft)	1		937			323
Turn Bay Length (ft)	30					
Base Capacity (vph)	469					5545
Starvation Cap Reductn	0					0
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.30					0.34

Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings

Project Panda

1404: SB M-1 [Woodward Ave Srv Rd] & WB M-102 [8 Mile Srv Rd]/WB M-102 [8 Mile Srv Rd]



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↙	↕						↕	↘
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	14	12	14	9	12	12	12	12	12	11	13
Storage Length (ft)	0		0	110		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Link Speed (mph)		40			40			40			40	
Link Distance (ft)		1243			174			245			473	
Travel Time (s)		21.2			3.0			4.2			8.1	
Lane Group Flow (vph)	0	0	0	203	594	0	0	0	0	0	916	0
v/c Ratio				0.18	0.29						0.73	
Control Delay				3.7	4.7						27.1	
Queue Delay				1.1	0.6						0.0	
Total Delay				4.9	5.3						27.1	
Queue Length 50th (ft)				24	44						126	
Queue Length 95th (ft)				42	60						172	
Internal Link Dist (ft)		1163			94			165			393	
Turn Bay Length (ft)				110								
Base Capacity (vph)				1152	2032						1250	
Starvation Cap Reductn				736	1014						0	
Spillback Cap Reductn				0	0						0	
Storage Cap Reductn				0	0						0	
Reduced v/c Ratio				0.49	0.58						0.73	

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings

1804: NB M-1 [Woodward Ave Srv Rd] & EB M-102 [8 Mile Srv Rd]



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	14	9	9	12	12	12	11	11	11	12	12	12
Storage Length (ft)	110		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Link Speed (mph)		40			40			40				40
Link Distance (ft)		166			1061			1294				234
Travel Time (s)		2.8			18.1			22.1				4.0
Lane Group Flow (vph)	339	702	0	0	0	0	0	1018	0	0	0	0
v/c Ratio	0.29	0.35						0.85				
Control Delay	3.6	3.8						36.2				
Queue Delay	1.5	0.9						0.0				
Total Delay	5.2	4.7						36.2				
Queue Length 50th (ft)	25	31						169				
Queue Length 95th (ft)	59	58						#236				
Internal Link Dist (ft)		86			981			1214				154
Turn Bay Length (ft)	110											
Base Capacity (vph)	1157	2026						1195				
Starvation Cap Reductn	623	979						0				
Spillback Cap Reductn	0	0						0				
Storage Cap Reductn	0	0						0				
Reduced v/c Ratio	0.63	0.67						0.85				

Intersection Summary

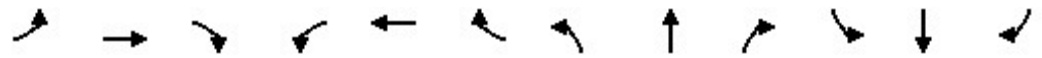
Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
 2915: Market Place Dr/Crossover & EB M-102 [8 Mile Rd]

Project Panda
 2032 Build ALT - PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑	↗						↖↖	↘	↑	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	14	12	12	12	12	12	11	16	16	16
Storage Length (ft)	0		280	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		2	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			No	No		Yes
Link Speed (mph)		40			40			25				40
Link Distance (ft)		269			680			385				86
Travel Time (s)		4.6			11.6			10.5				1.5
Lane Group Flow (vph)	0	3185	129	0	0	0	0	0	228	164	125	0
v/c Ratio		0.60	0.10						0.92	0.90	0.65	
Control Delay		7.5	1.0						110.8	100.0	75.5	
Queue Delay		0.0	0.0						0.0	0.0	0.0	
Total Delay		7.5	1.0						110.8	100.0	75.5	
Queue Length 50th (ft)		184	0						136	174	129	
Queue Length 95th (ft)		192	m10						#230	m#301	m183	
Internal Link Dist (ft)		189			600			305				6
Turn Bay Length (ft)			280									
Base Capacity (vph)		5343	1238						248	184	194	
Starvation Cap Reductn		0	0						0	0	0	
Spillback Cap Reductn		0	0						0	0	0	
Storage Cap Reductn		0	0						0	0	0	
Reduced v/c Ratio		0.60	0.10						0.92	0.89	0.64	

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width (ft)	12	12	16	12	12	12
Storage Length (ft)		0	230		0	0
Storage Lanes		0	2		0	0
Taper Length (ft)			25		25	
Link Speed (mph)	40			40	40	
Link Distance (ft)	311			682	86	
Travel Time (s)	5.3			11.6	1.5	
Lane Group Flow (vph)	0	0	289	3337	0	0

Intersection Summary

Area Type:	Other
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