TRAFFIC IMPACT STUDY FOR

DRI #3974
THE GROVE
MIXED-USE DEVELOPMENT

DATE:
July 3, 2023

LOCATION:
Henry County, Georgia

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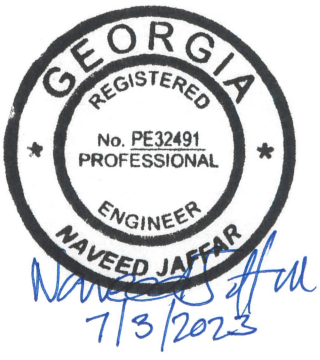

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Executive Summary

A new master-planned mixed-use residential development is proposed for construction on undeveloped land parcels west of US 41 and south of Lovejoy Road in Henry County, Georgia (see Appendix A for site plan detail). Once the proposed development is completely built-out, it will consist of 7,160 residential units, a 180-room hotel, 100,000 square feet of village retail, and approximately 1,990,000 square feet of commercial retail.

The development is expected to be fully built-out by 2048 and Phase 1 is expected to be completed by 2028. Phase 1 of the development will generate a total of 28,170 new daily trips. Of these daily volumes, 919 new trips (391 entering and 525 exiting) are expected to occur during the AM peak hour while 2,122 new trips (1,115 entering and 1,007 exiting) are expected to occur during the PM peak hour. When Phase 5, the final phase, is built-out, the development will generate a total of 94,970 new daily trips. Of these daily volumes, 3,605 new trips (1,353 entering and 2,252 exiting) are expected to occur during the AM peak hour while 7,160 new trips (3,926 entering and 3,234 exiting) are expected to occur during the PM peak hour.

The development will contain eight (8) access points in total:

- one (1) full-access point at US 41 and Talmadge Road as an extension driveway
- one (1) full-access point at US 41, south of the Villas at Hampton residential neighborhood
- one (1) left-in (R-CUT) access point at US 41, north of the North Drive residential neighborhood
- one (1) right-in/right-out (RIRO) access point along the east side of US 41, between North Drive and North Circle Drive
- one (1) full-access point at US 41 and North Circle Drive
- one (1) full-access point at US 41 and South Drive
- two (2) right-in/right-out (RIRO) access points along the east side of US 41, south of South Circle Drive and north of Upper Woolsey Road

Existing intersections adjacent to the planned development were evaluated to determine if new roadway geometries or traffic controls will be needed once the development is built. The following intersections were evaluated:

1. US 41 at Mundy's Mill Road
2. US 41 at Iron Gate Boulevard / S Main Street
3. US 41 at Tara Road
4. US 41 at McDonough Road
5. US 41 at Lovejoy Road
6. US 41 at Talmadge Road
7. US 41 at North Drive
8. US 41 at N Circle Drive
9. US 41 at S Circle Drive

10. US 41 at South Drive
11. US 41 at SR 81 / Upper Woolsey Road
12. SR 81 at Old Dixie Highway
13. Hastings Bridge Road at Talmadge Road / County Landfill Road
14. McDonough Road at Hastings Bridge Road
15. SR 81 at Mt. Carmel Road

In Existing Conditions, overall traffic operations at the study intersections are satisfactory except for the southbound approach at the intersection of SR 81 and Mt. Carmel Road and the side street approaches at the intersection of US 41 with Talmadge Road which operate at Levels of Service (LOS) F during both the AM and PM peak hours. This is somewhat expected for a side street approaching a high-volume highway at a stop-controlled intersection. Similarly, the minor street approaches at the signalized intersections of US 41 with Mundy's Mill Road, Iron Gate Boulevard / S Main Street, Tara Road, McDonough Road, and Lovejoy Road operate at LOS E or F during both the AM and PM peak hours due to the high cycle length signal timing favoring traffic along US 41.

In 2028 No-Build Conditions, traffic operations at these intersection approaches are expected to worsen due to the growth in background traffic and the addition of traffic from nearby developments. The signalized intersections of US 41 with Mundy's Mill Road, Iron Gate Boulevard / S Main Street, and Tara Road are expected to experience some improvements in delay along US 41 due to the upcoming completion of the US 41 road widening project and signal improvements. The eastbound approach at the intersection of US 41 with North Drive is expected to operate with undesirable LOS due to the increased growth during the PM peak hour. Other intersections are expected to operate with similar LOS to 2023 existing conditions.

In 2048 No-Build Conditions, traffic operations at these intersections are expected to worsen to the point that many of the intersections have at least one approach operating at undesirable LOS during both the AM and PM peak hours.

In 2028 Build Conditions, the addition of project traffic is expected to have minor impacts to future traffic operations at the study intersections. The intersection of US 41 with McDonough Road, which is expected to reach capacity without the development, is expected to operate with undesirable LOS during both the AM and PM peak hours, and the intersection of Hastings Bridge Road with Talmage Road / County Landfill Road is expected to be over capacity during the PM peak hour.

In 2048 Build Conditions, the addition of project traffic is expected to have major impacts to future traffic operations at the study intersections to the point that the roadways will be over capacity without major mitigations.

Every site driveway is expected to operate with undesirable LOS during the PM peak hour, and with the exception of driveways 3A, 3B, 7 and 8, all site driveways are expected to operate with undesirable LOS during the AM peak hour.

Table A summarizes the changes observed in intersections with undesirable Levels of Service (LOS) approaches between the 2048 No-Build and Build Conditions during AM and PM peak hours. The table also compares a relationship between the percent of site traffic associated with future movements and approaches with LOS E or F in Build Conditions, and the capacity analysis results of Build Mitigation Conditions. No traffic control to signal timing improvements have been made between No-Build and Build Conditions.

Parameters evaluated for Build Mitigation Conditions are identified on the following pages of the Executive Summary, labelled as Recommended Advisory Condition improvements. These parameters are also identified in Report Section D: Traffic Impact Analysis and Report Section G: Recommendations, for reference.

Table B summarizes where the turn storage lengths and taper lengths are exceeded by either existing or future through-movement traffic volumes where there is a LOS E or F presence.

The general conditions and roadway improvement conditions that are recommended for DRI #3974 are on the pages following Table B results.

Table A: Capacity Analysis Result Summary – 2048 No-Build, Build, and Build Mitigation Condition Relationships

ID	Intersection	Existing Control	Mitigation Measure	Movement	AM									PM								
					No-Build		Build		Site Traffic	Total Traffic	% of Total Traffic	Mitigation		No-Build		Build		Site Traffic	Total Traffic	% of Total Traffic	Mitigation	
					LOS	Delay	LOS	Delay				LOS	Delay	LOS	Delay	LOS	Delay				LOS	Delay
11	US 41 & SR 81 / Upper Woolsey Rd	Signal	Road Widening	**Overall**	**C**	**21.5**	**D**	**46.1**	**1,083**	**5,136**	**21%**	**D**	**46.5**	**C**	**29.0**	**F**	**115.8**	**2,148**	**6,836**	**31%**	**F**	**116.9**
				EB	D	45.8	E	57.4	0	331	0%	E	57.4	D	40.4	D	42.4	0	267	0%	D	42.4
				WB	D	46.5	E	56.6	203	647	31%	E	62.5	E	57.4	D	54.3	589	1,239	48%	E	70.5
				NB	B	18.7	D	52.7	204	2,300	9%	D	52.7	C	21.2	F	136.5	589	2,243	26%	F	136.5
				SB	B	14.5	C	34.7	676	1,858	36%	C	34.7	C	27.9	F	115.2	970	3,087	31%	F	115.2
12	SR 81 & Old Dixie Hwy	Signal	Road Widening	**Overall**	**C**	**22.5**	**F**	**134.7**	**1,262**	**3,747**	**34%**	**C**	**26.1**	**C**	**20.5**	**F**	**287.2**	**2,506**	**5,327**	**47%**	**F**	**109.5**
				EB	B	19.2	F	134.5	338	1,040	33%	B	17.7	B	15.2	F	135.9	485	1,133	43%	B	13.4
				WB	B	17.5	D	49.9	474	1,330	36%	C	28.5	B	19.2	F	32.8	1,374	2,484	55%	F	148.3
				NB	C	32.8	C	34.2	0	500	0%	C	32.6	C	29.4	C	31.2	0	435	0%	C	30.0
				SB	C	25.6	F	>300	450	877	51%	C	28.9	C	21.1	F	>300	647	1,275	51%	F	146.6
13	Hastings Bridge Rd & Talmadge Rd / County Landfill Rd	Signal	Signal Timings & Road Widening	**Overall**	**F**	**153.7**	**F**	**>300**	**901**	**2,704**	**33%**	**F**	**226.0**	**F**	**285.8**	**F**	**>300**	**1,790**	**3,994**	**45%**	**F**	**>300**
				EB	C	31.8	F	>300	563	971	58%	F	242.7	D	43.4	F	>300	809	1,287	63%	F	>300
				WB	B	14.8	B	13.4	0	7	0%	C	20.9	B	14.9	B	12.2	0	17	0%	C	24.4
				NB	F	334.3	F	>300	271	1,019	27%	F	176.9	F	>300.0	F	>300	785	1,610	49%	F	>300
				SB	C	22.1	D	46.3	67	707	9%	F	275.8	E	70.3	F	270.3	196	1,080	18%	F	>300
14	McDonough Rd & Hastings Bridge Rd	Stop-Control	Road Widening	SB	F	>300.0	F	159.1	270	746	36%	F	>300	F	>300.0	F	>300	785	1,317	60%	F	266.2
				EBL	B	13.0	D	31.0	338	1,066	32%	D	31.5	C	15.1	F	96.2	485	1,179	41%	F	97.9
15	SR 81 & Mt Carmel Rd	Stop-Control	Road Widening	SB	F	150.9	F	>300	203	767	26%	F	232.9	F	>300.0	F	>300	589	1,270	46%	F	>300
				EBL	D	34.3	F	>300	338	1,094	31%	F	>300	C	22.9	F	>300	485	1,115	43%	F	>300

Table B: Queue Analysis Result Summary – Existing, No-Build, and Build Condition Relationships

ID	Intersection	Turn Lane / Movement Approach	Lengths, in feet		50th (95th) Percentile Queues, in feet									
					Existing		2028 No-Build		2028 Build		2048 No-Build		2048 Build	
			Storage	Taper	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	US 41 & Mundy's Mill Rd	EB-L	135	50	112 (178)	74 (117)	117 (172)	74 (110)	117 (172)	74 (116)	164 (253)*	102 (158)	167 (282)*	113 (239)*
		EB-R	50	90	0 (0)	0 (53)	0 (21)	0 (0)	0 (12)	0 (68)	0 (24)	0 (58)	39 (115)	312 (529)*
		WB-L	120	50	77 (132)	371 (508)*	81 (128)	340 (408)	81 (128)	341 (431)	112 (172)	578 (820)*	114 (180)*	714 (957)*
		WB-TR	N/A	N/A	208 (376)*	284 (372)	204 (285)	288 (359)	204 (285)	287 (374)	303 (434)*	439 (577)	307 (473)*	480 (710)*
		NB-L	390	115	16 (23)	33 (110)	32 (57)	75 (176)	52 (77)	163 (284)	50 (70)	253 (445)*	218 (249)	540 (771)*
		NB-R	400	180	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		SB-L	390	115	3 (8)	5 (16)	4 (13)	7 (22)	4 (13)	7 (21)	7 (18)	13 (31)	7 (17)	11 (26)
		SB-R	320	140	0 (0)	0 (29)	0 (11)	0 (0)	0 (0)	0 (0)	0 (13)	0 (29)	0 (0)	0 (29)
2	US 41 & Iron Gate Blvd / S Main St	EB-L	120	110	450 (643)*	60 (110)	311 (401)	65 (118)	311 (402)	65 (119)	464 (664)*	98 (162)	478 (713)*	98 (162)
		EB-R	130	85	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		WB-L	100	135	124 (200)*	195 (289)*	134 (179)	211 (262)	146 (194)	244 (299)	204 (307)*	319 (428)*	261 (378)*	513 (646)*
		WB-R	100	70	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		NB-L	330	100	10 (30)	66 (115)	12 (34)	104 (155)	7 (37)	103 (172)	41 (52)	235 (355)*	41 (44)	250 (426)*
		NB-R	135	75	35 (221)	81 (168)	29 (177)	111 (173)	9 (199)	143 (235)	347 (379)	193 (240)	374 (432)	326 (429)*
		SB-L	230	125	1 (4)	2 (5)	1 (4)	3 (5)	1 (4)	3 (5)	1 (4)	5 (7)	1 (2)	6 (5)
		SB-R	135	100	0 (0)	1 (18)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	9 (15)	0 (0)	9 (6)
3	US 41 & Tara Rd	EB-L	230	50	294 (347)	303 (355)	323 (375)	333 (397)	323 (375)	335 (409)*	475 (554)	598 (735)*	492 (626)*	647 (784)*
		EB-R	300	50	0 (36)	85 (159)	0 (37)	96 (178)	0 (37)	124 (213)	8 (49)	262 (379)	10 (54)	277 (436)*
		NB-L	400	100	4 (9)	60 (150)	1 (1)	110 (165)	6 (13)	135 (156)	13 (11)	274 (214)*	34 (15)	285 (148)*
		SB-R	120	50	34 (73)	73 (137)	25 (41)	48 (135)	27 (43)	50 (120)	54 (109)	144 (167)	60 (131)	161 (134)
4	US 41 & McDonough Rd	EB-L	315	65	119 (185)	135 (206)	143 (294)*	147 (281)*	145 (303)*	143 (212)*	316 (501)*	335 (528)*	312 (501)*	272 (467)*
		EB-R	270	75	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (75)	0 (0)	0 (0)	20 (103)	497 (736)*
		WB-L	330	235	87 (141)	147 (220)	97 (176)*	158 (272)*	176 (347)*	441 (659)*	201 (368)*	362 (560)*	594 (816)*	1634 (1901)*
		WB-R	125	115	102 (199)	16 (92)	121 (216)	30 (105)	80 (174)	66 (145)	248 (397)*	116 (219)	196 (317)	152 (253)
		NB-L	375	110	109 (263)	162 (310)*	194 (353)	267 (437)*	350 (492)	482 (675)*	749 (755)*	587 (754)*	1287 (910)*	1384 (1244)*
		NB-R	N/A	N/A	6 (29)	9 (43)	21 (55)	16 (51)	92 (141)	167 (219)	104 (110)	98 (186)	372 (268)	542 (481)
		SB-L	370	110	380 (612)*	146 (294)	403 (643)*	292 (498)*	431 (642)*	440 (596)*	836 (1083)*	857 (705)*	887 (1131)*	1043 (660)*
		SB-R	1000	110	10 (23)	3 (1)	12 (26)	1 (6)	9 (22)	0 (1)	18 (35)	6 (4)	11 (17)	6 (0)
5	US 41 & Lovejoy Rd	EB-L	160	50	246 (334)	202 (319)*	271 (362)	147 (281)*	269 (372)*	253 (432)*	464 (679)*	448 (651)*	531 (746)*	506 (709)*
		EB-TR	N/A	N/A	271 (339)	323 (422)	294 (359)	0 (0)	295 (366)	371 (556)*	424 (562)	578 (830)*	459 (609)	665 (910)*
		WB-TL	N/A	N/A	194 (248)	208 (285)	208 (258)	158 (272)*	207 (262)	235 (342)	276 (374)	381 (599)*	306 (418)	543 (754)*
		WB-R	80	50	60 (125)	51 (112)	71 (135)	30 (105)	77 (143)	52 (124)	167 (263)	123 (208)	219 (325)	122 (211)
		NB-L	420	110	90 (165)	131 (369)*	111 (198)	267 (437)*	181 (316)	345 (554)*	449 (672)*	644 (881)*	540 (473)*	734 (483)*
		NB-R	185	185	0 (0)	0 (0)	0 (0)	16 (51)	0 (0)	0 (1)	0 (0)	0 (2)	0 (0)	0 (0)
		SB-L	395	125	33 (89)	54 (74)	64 (149)	292 (498)*	75 (145)	86 (70)	167 (197)*	238 (169)	185 (128)*	363 (105)*
		SB-R	335	50	7 (25)	11 (22)	9 (68)	1 (6)	8 (51)	39 (32)	71 (85)	114 (76)	48 (31)	109 (26)

ID	Intersection	Turn Lane / Movement Approach	Lengths, in feet		50th (95th) Percentile Queues, in feet									
					Existing		2028 No-Build		2028 Build		2048 No-Build		2048 Build	
			Storage	Taper	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
6	US 41 & Talmadge Rd / Driveway 1	EB-L[1]	N/A	N/A	136 (61)	84 (170)	62 (119)	137 (288)	138 (201)	151 (208)	127 (297)	920 (516)	435 (657)*	679 (911)*
		EB-R[1]	N/A	N/A					97 (159)	200 (284)			446 (661)*	793 (1035)*
		WB-L[1]	N/A	N/A	103 (40)	61 (133)	44 (98)	83 (184)	98 (151)	199 (264)	27 (209)	268 (112)	335 (540)*	1131 (1390)*
		WB-TR[1]	N/A	N/A					71 (131)	200 (275)			259 (442)*	697 (941)*
		NB-L	425	100	27 (3)	14 (42)	3 (14)	15 (43)	5 (11)	22 (74)	183 (810)	89 (26)	16 (16)	177 (113)
		NB-R	230	140	2 (0)	13 (39)	0 (2)	0 (2)	2 (12)	14 (33)	44 (242)	1 (0)	95 (94)	228 (166)
		SB-L	430	125	90 (18)	0 (0)	20 (51)	14 (38)	21 (55)	37 (38)	25 (74)	97 (22)	81 (59)	83 (34)
		SB-R	375	125	1 (0)	0 (8)	0 (0)	1 (18)	3 (6)	56 (54)	0 (0)	2 (3)	17 (11)	301 (95)
7	US 41 & North Dr	EB-LR	N/A	N/A	5 (23)	3 (7)	6 (26)	5 (23)	4 (21)	2 (15)	6 (26)	7 (27)	8 (29)	4 (20)
		NB-L	250	100	2 (13)	1 (7)	1 (11)	1 (10)	2 (15)	3 (61)	0 (6)	2 (13)	11 (93)	2 (15)
8	US 41 & N Circle Dr / Driveway 5	EB-L	N/A	N/A	N/A	N/A	N/A	N/A	2 (13)	0 (6)	N/A	N/A	2 (13)	2 (12)
		EB-TR	N/A	N/A	N/A	N/A	N/A	N/A	4 (21)	4 (20)	N/A	N/A	7 (27)	6 (25)
		WB-L	75	50	N/A	N/A	N/A	N/A	43 (92)	100 (189)	N/A	N/A	464 (642)	516 (590)
		WB-TR	N/A	N/A	N/A	N/A	N/A	N/A	11 (30)	27 (58)	N/A	N/A	165 (481)	257 (641)
		NB-L	235	100	N/A	N/A	N/A	N/A	1 (8)	1 (11)	N/A	N/A	2 (12)	3 (17)
		NB-R	175	100	N/A	N/A	N/A	N/A	2 (17)	13 (69)	N/A	N/A	47 (203)	69 (197)
		SB-L	235	100	N/A	N/A	N/A	N/A	22 (51)	52 (94)	N/A	N/A	71 (144)	158 (278)
		SB-R	175	100	N/A	N/A	N/A	N/A	N/A	2 (35)	N/A	N/A	N/A	2 (34)
9	US 41 & S Circle Dr / Driveway 7	EB-LTR	N/A	N/A	4 (19)	4 (2)	3 (18)	4 (21)	1 (11)	2 (15)	3 (17)	11 (33)	2 (13)	9 (31)
10	US 41 & South Dr / Driveway 6	EB-LTR	N/A	N/A	N/A	N/A	N/A	N/A	4 (20)	3 (18)	N/A	N/A	12 (37)	19 (57)
		WB-LTR	N/A	N/A	N/A	N/A	N/A	N/A	28 (66)	262 (513)	N/A	N/A	391 (486)	400 (429)
		NB-L	235	100	N/A	N/A	N/A	N/A	10 (36)	23 (53)	N/A	N/A	75 (234)	57 (113)
			175	100	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	35 (185)	1 (8)
		SB-L	235	100	N/A	N/A	N/A	N/A	3 (16)	12 (39)	N/A	N/A	6 (24)	26 (66)
11	US 41 & SR 81 / Upper Woolsey Rd	EB-L	140	140	61 (108)	31 (62)	68 (116)	35 (67)	68 (116)	34 (68)	99 (160)	48 (95)	101 (207)*	49 (98)
		EB-TR	N/A	N/A	93 (149)	81 (127)	102 (160)	88 (137)	102 (159)	87 (139)	149 (215)	125 (198)	152 (237)	129 (204)
		WB-L	200	100	61 (110)	106 (164)	68 (119)	118 (182)	67 (118)	117 (184)	102 (188)*	179 (343)*	110 (239)*	198 (360)*
		WB-R	125	115	0 (50)	0 (51)	0 (51)	0 (52)	8 (69)	0 (75)	63 (125)	0 (61)	84 (218)*	510 (758)*
		NB-L	440	125	1 (6)	1 (7)	1 (6)	2 (8)	1 (7)	2 (7)	3 (11)	3 (9)	3 (8)	3 (9)
		NB-R	335	175	0 (3)	0 (26)	0 (5)	0 (11)	0 (0)	0 (14)	0 (18)	0 (39)	0 (0)	2 (46)
		SB-L	300	75	9 (25)	29 (66)	10 (28)	35 (76)	24 (59)	96 (215)	26 (92)	121 (210)	346 (547)*	728 (957)*
		SB-R	175	165	0 (0)	0 (3)	0 (0)	0 (5)	0 (0)	0 (6)	0 (2)	0 (17)	0 (2)	0 (18)
12	SR 81 & Old Dixie Hwy	EB-L	250	90	6 (22)	3 (16)	6 (24)	4 (17)	7 (26)	5 (20)	11 (34)	7 (27)	14 (59)*	8 (34)
		EB-R	170	110	0 (7)	0 (11)	0 (9)	0 (14)	0 (9)	0 (15)	0 (23)	0 (30)	0 (25)	2 (33)
		WB-L	190	85	12 (40)	16 (47)	14 (45)	19 (53)	17 (54)	23 (66)	31 (108)*	37 (98)	40 (136)*	67 (174)*
		WB-R	200	90	0 (38)	0 (41)	0 (39)	0 (42)	0 (48)	0 (58)	0 (45)	0 (51)	18 (104)	544 (827)*

ID	Intersection	Turn Lane / Movement Approach	Lengths, in feet		50th (95th) Percentile Queues, in feet									
					Existing		2028 No-Build		2028 Build		2048 No-Build		2048 Build	
			Storage	Taper	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
		NB-L	155	90	16 (51)	21 (66)	18 (57)	26 (74)	22 (59)	34 (75)	37 (83)	53 (107)	40 (83)	53 (107)
		NB-R	260	100	0 (42)	0 (25)	0 (44)	0 (31)	0 (46)	0 (31)	23 (87)	0 (46)	47 (117)	14 (62)
		SB-L	240	90	31 (84)	35 (98)	38 (101)	44 (114)	78 (160)	145 (260)*	92 (174)*	107 (174)	476 (679)*	653 (1018)*
		SB-R	200	100	0 (8)	0 (18)	0 (9)	0 (20)	0 (9)	0 (19)	0 (17)	0 (24)	0 (16)	11 (35)
13	Hastings Bridge Rd & Talmadge Rd / County Landfill Rd	EB-LTR	N/A	N/A	45 (106)	54 (125)	55 (122)	66 (145)	96 (237)*	192 (371)*	116 (267)*	139 (318)*	545 (751)*	730 (961)*
		WB-LTR	N/A	N/A	0 (6)	1 (10)	0 (6)	1 (11)	0 (6)	1 (11)	1 (8)	2 (14)	1 (8)	2 (12)
		NB-L	50	50	54 (159)*	57 (199)*	70 (226)*	81 (246)*	177 (322)*	255 (426)*	231 (390)*	262 (421)*	543 (730)*	929 (1156)*
		NB-TR	N/A	N/A	29 (74)	38 (88)	35 (81)	46 (97)	45 (81)	56 (97)	73 (123)	90 (152)	79 (133)	105 (177)
		SB-L	50	50	0 (4)	1 (4)	1 (4)	1 (4)	1 (4)	1 (4)	1 (6)	1 (5)	1 (6)	1 (6)
		SB-TR	N/A	N/A	50 (130)	74 (187)	62 (150)	98 (223)	86 (157)	134 (256)	167 (309)*	272 (537)*	215 (435)*	524 (744)*
14	McDonough Rd & Hastings Bridge Rd	EB-LT	N/A	N/A	91 (223)	165 (373)	155 (339)	146 (310)	168 (362)	133 (278)	239 (498)	188 (413)	170 (339)	137 (296)
		WB-TR	N/A	N/A	30 (111)	78 (297)	44 (157)	18 (79)	49 (166)	28 (100)	163 (403)	76 (237)	81 (778*)	37 (108)
		SB-LR	N/A	N/A	27 (120)	141 (546)	79 (302)	30 (130)	237 (710*)	763* (1464*)	867* (1684*)	402 (1026*)	1098* (1673*)	1223* (1453*)
15	SR 81 & Mt Carmel Rd	EB-LT	N/A	N/A	184 (386)	130 (258)	512 (2434*)	377 (2434*)	1932* (2434*)	1560* (2949*)	2032* (3175*)	1562* (2830*)	2228* (3186*)	2198* (3065*)
		SB-LR	N/A	N/A	888* (1851*)	456 (1235*)	2113* (1597*)	1918* (1597*)	2144* (1597*)	1467* (2038*)	1515* (1960*)	1541* (1858*)	1563* (1823*)	1602* (1611*)

To receive the Notice of Decision Request for Non-Expedited DRI #3974 – The Grove, the following general conditions and roadway improvement conditions are recommended.

General Conditions:

Pedestrian, Bicycle, and Transit Facilities

- Provide internal pedestrian sidewalk and crosswalk connectivity from the site to US 41.
- Provide pedestrian sidewalk along both sides of US 41 between Talmadge Road and SR 81.
- Provide striped pedestrian crossings across all driveways along US 41 and crossing US 41 at any proposed signalized intersections.
- Provide trail markers and accessible connections between internal pedestrian sidewalks and the trail infrastructure within the proposed development.
- Consider providing additional trail markers and accessible connections between external pedestrian sidewalks and trail infrastructure to the proposed development.

Recommended Roadway Improvement Conditions of Approval:

US 41 & Talmadge Road / Driveway 1

- Install a traffic signal, if warranted and as approved by GDOT/Henry County
- Install additional westbound and eastbound lanes for left-turn lanes.

US 41 & Driveway 2A / Driveway 2B

- Install a traffic signal, if warranted and as approved by GDOT/Henry County
- Install two eastbound left-turn lanes, and a shared through and right-turn lane.
- Install a separate westbound left-turn, and a shared through and right-turn lane.
- Add northbound and southbound right-turn lanes and left-turn lanes.

US 41 & Driveway 3A / Driveway 3B

- Install a R-Cut Intersection with northbound and southbound left-turn and right-turn lanes

US 41 & North Drive

- Convert intersection to a R-Cut

US 41 & Driveway 4

- Add a northbound right-turn lane.

US 41 & N Circle Drive Driveway 5

- Install a traffic signal, if warranted and as approved by GDOT/Henry County
- Install an eastbound left-turn and a shared through / right-turn lane.
- Install a westbound left-turn and a shared through / right-turn lane.
- Add northbound right-turn lane and convert the existing southbound U-turn lane into a left-turn lane.

US 41 & S Circle Dr

- Convert to a Right-In / Right-Out intersection.

US 41 & South Drive / Driveway 6

- Add a northbound left-turn and right-turn lane.
- Add a southbound left-turn and right-turn lane.

US 41 & Driveway 7

- Add a northbound right-turn lane.

US 41 & Driveway 8

- Add a northbound right-turn lane.

Recommended Roadway Improvement Advisory Conditions:

SR 81

- Widen the roadway to a four-lane divided between US 41 and east of Mt. Carmel Road.

Hastings Bridge Road / Old Dixie Highway

- Widen the roadway to four-lane divided north of its intersection with SR 81 to its intersection with McDonough Road.

These conditions are based on the approved Methodology Meeting inputs and parameters identified in the Georgia Regional Transportation Authority (GRTA) Letter of Understanding (LOU), dated June 16, 2023. The GRTA LOU is provided at the end of this report for reference.

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A. Introduction

A new master-planned mixed-use residential development is proposed for construction on undeveloped land parcels west of US 41 and south of Lovejoy Road in Henry County, Georgia (see Appendix A for site plan detail). Once the proposed development is completely built-out, it will consist of 7,160 residential units, a 180-room hotel, 100,000 square feet of village retail, and approximately 1,990,000 square feet of commercial retail.

The development will contain eight (8) access points in total:

- one (1) full-access point at US 41 and Talmadge Road as an extension driveway
- one (1) full-access point at US 41, south of the Villas at Hampton residential neighborhood
- one (1) left-in (R-CUT) access point at US 41, north of the North Drive residential neighborhood
- one (1) right-in/right-out (RIRO) access point along the east side of US 41, between North Drive and North Circle Drive
- one (1) full-access point at US 41 and North Circle Drive
- one (1) full-access point at US 41 and South Drive
- two (2) right-in/right-out (RIRO) access points along the east side of US 41, south of South Circle Drive and north of Upper Woolsey Road

The purpose of this assessment is to identify the traffic expected to be generated by new vehicular trips when Phases 1 and 5 of the development are complete in the year 2028 and 2048, respectively. The traffic study includes existing traffic volumes, future traffic volumes (2028 and 2048), trip generation, directional distribution, and anticipated traffic impacts at the following existing intersections:

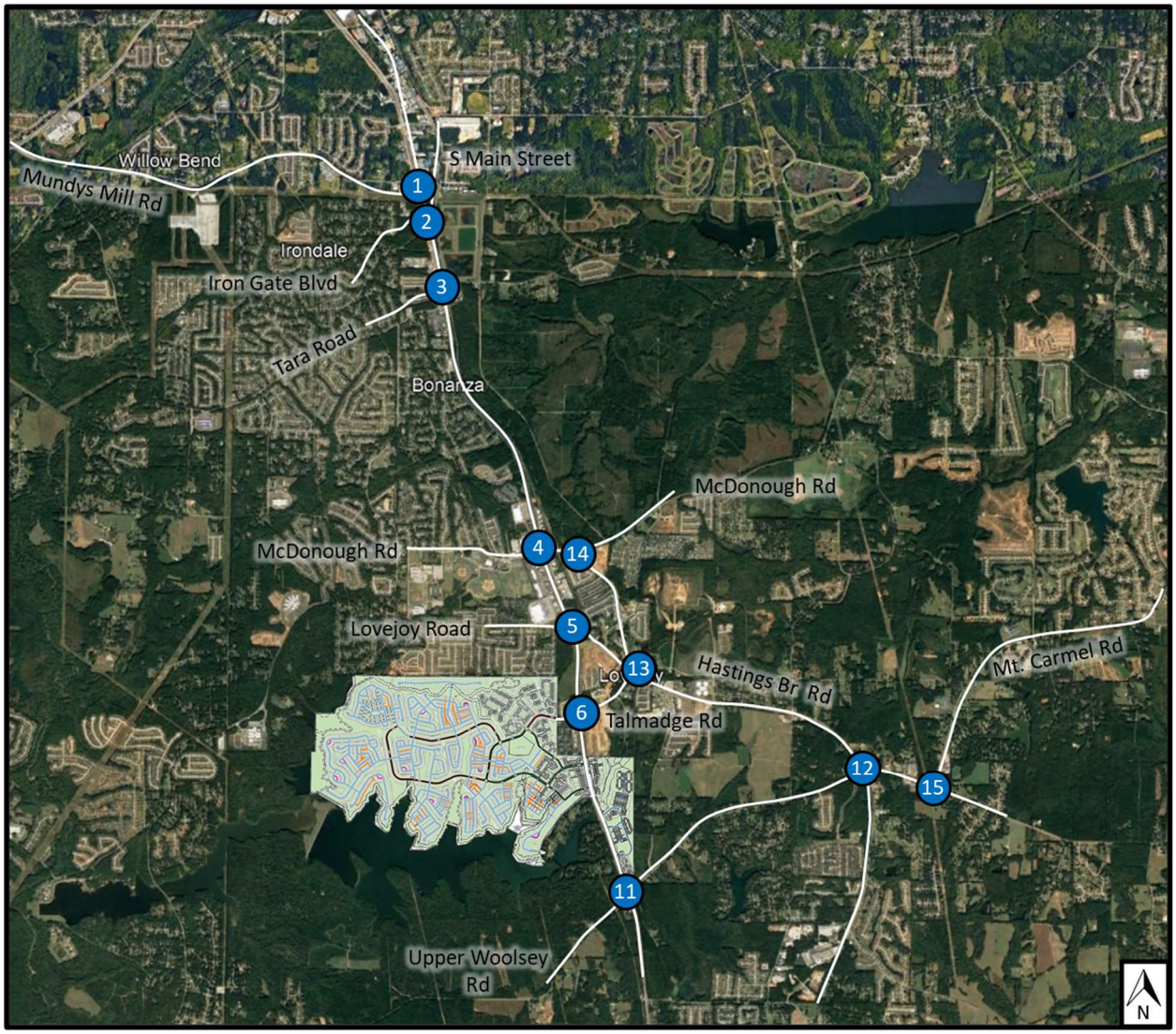
1. US 41 at Mundy's Mill Road
2. US 41 at Iron Gate Boulevard / S Main Street
3. US 41 at Tara Road
4. US 41 at McDonough Road
5. US 41 at Lovejoy Road
6. US 41 at Talmadge Road
7. US 41 at North Drive
8. US 41 at N Circle Drive
9. US 41 at S Circle Drive
10. US 41 at South Drive
11. US 41 at SR 81 / Upper Woolsey Road
12. SR 81 at Old Dixie Highway
13. Hastings Bridge Road at Talmadge Road / County Landfill Road
14. McDonough Road at Hastings Bridge Road
15. SR 81 at Mt. Carmel Road

Figure 1 shows the site location and study intersections mentioned above. Figure 2 shows the proposed development with associated driveway locations. Access to the site will be via eleven (11) outlets shown in Figure 2 and mentioned above. The proposed site plan is provided in Appendix A.

A.1. Programmed & Planned Regional Transportation Improvements

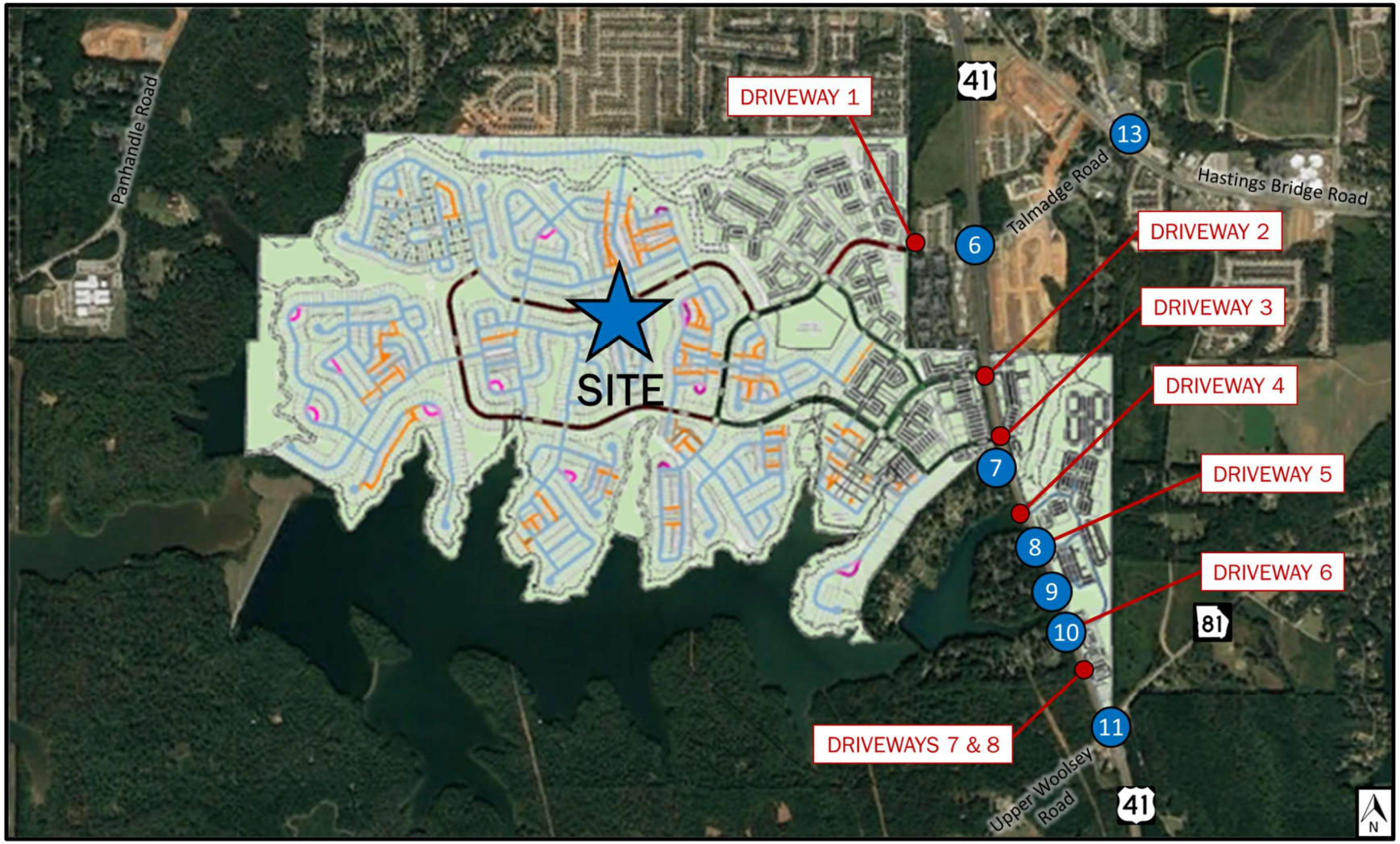
Regional transportation improvements were investigated using the Atlanta Regional Commission's (ARC's) Transportation Improvement Program (TIP) database to verify if any large-scale infrastructure projects are planned for in the immediate area. There is one project that will widen US 41 between Mundy's Mill Road and Tara Road. It is expected to be completed before the proposed site's first phase build out year of 2028 and has been included in the analysis of this study.

Figure 1. Site Location & Study Intersections



LEGEND	
1. US 41 at Mundy Mills Road	9. US 41 at S Circle Drive
2. US 41 at S Main Street/Iron Gate Boulevard	10. US 41 at South Drive
3. US 41 at Tara Road	11. US 41 at SR 81/Upper Woolsey Road
4. US 41 at McDonough Road	12. SR 81 at Old Dixie Highway
5. US 41 at Lovejoy Road	13. Hastings Bridge Road at Talmadge Road
6. US 41 at Talmadge Road	14. Hastings Bridge Road at McDonough Road
7. US 41 at North Drive	15. SR 81 at Mt. Carmel Road
8. US 41 at N Circle Drive	

Figure 2. Driveway Layout & Additional Study Intersections



B. Existing Conditions

B.1. Project Phasing

The development will be built-out in five phases with the first phase completed by 2028 and the fifth and final phase by 2048.

B.2. Transportation Facilities and LOS Standards

US 41 (Tara Boulevard) is a five-lane divided principal arterial roadway that runs north-south with dedicated left turn lanes and right turn lanes to side streets. US 41 connects with I-75 to the north and with SR 20 to the south. The roadway has a posted speed limit of 55 MPH and provides access to adjacent residential neighborhoods, commercial land uses, industrial land uses, and institutional land uses.

McDonough Road (Jonesboro Road) is a two-lane undivided principal arterial roadway that runs east-west in the study area and connects with SR 54 to the west and I-75 to the east. The roadway has a posted speed limit of 45 MPH, with a posted 25 MPH speed limit during school hours, and provides access to adjacent residential neighborhoods, institutional, and commercial/retail land uses.

Hastings Bridge Road / Old Dixie Highway is a two-lane undivided minor arterial roadway that runs north-south and intersects with McDonough Road to the north and Highway 81 to the south. It has a posted speed limit of 45 MPH north of Lovejoy Road, a posted speed limit of 35 MPH south of Lovejoy Road, and a posted speed limit of 55 MPH south of Talmadge Road. The roadway provides access to commercial/retail, institutional, and residential land uses.

SR 81 (Upper Woolsey Road) is a two-lane undivided roadway that runs east-west and intersects with US 41 south of the site and I-75 east of the site. East of US 41, SR 81 is a minor arterial with a posted speed limit of 55 MPH. West of US 41, Highway 81 is a major collector roadway with a posted speed limit of 45 MPH. Highway 81 provides access to residential, agricultural, and commercial land uses.

Talmadge Road is a two-lane undivided local roadway that runs east-west in the study area and connects with US 41 to the west and Hastings Bridge Road to the east. Talmadge Road has a posted speed limit of 35 MPH and provides access to adjacent residential neighborhoods.

Lovejoy Road is a two-lane undivided local roadway north of Talmadge Road that runs east-west and intersects with SR 81 to the east. The roadway has a posted 35 MPH speed limit, with a posted 25 MPH speed limit during school hours, and provides access to residential, commercial, and institutional land uses.

Tara Road is a two-lane undivided local roadway north of the site that runs east-west and intersects with US 41. The roadway has a posted 40 MPH speed limit, with a posted 25 MPH speed limit during school hours and provides access to residential and institutional land uses.

S Main Street is a two-lane undivided minor arterial roadway north of the site that runs north-south and intersects with US 41. The roadway has a posted 45 MPH speed limit and provides access to residential, industrial, and commercial land uses.

Iron Gate Boulevard is a two-lane undivided local roadway north of the site that runs east-west and intersects with US 41 at S Main Street. The roadway has a posted 30 MPH speed limit and provides access to residential land uses.

Mundy's Mill Road is a two-lane undivided major collector roadway north of the site that runs east-west and intersects with SR 54 to the west and S Main Street to the east. The roadway has a posted 40 MPH speed limit, with a posted 25 MPH speed limit during school hours and provides access to residential and commercial land uses.

Flint River Road is a four-lane divided minor arterial roadway north of the site that runs east-west and intersects with US 41 to the east and SR 85 to the west. The roadway has a posted 40 MPH speed limit and provides access to residential and commercial land uses.

North Drive is a two-lane undivided local roadway that runs east-west. The roadway has a posted speed limit of 25 MPH and provides access to residential land uses.

South Drive is a two-lane undivided local roadway that runs east-west. The roadway has a posted speed limit of 25 MPH and provides access to residential land uses.

Circle Road is a two-lane undivided local roadway with a posted speed limit of 25 MPH. The roadway provides access to residential land uses.

LOS D is considered the minimum standard unless existing conditions are lower.

B.3. Pedestrian and Multi-Use Facilities

There is minimal existing pedestrian sidewalk infrastructure and bicycle infrastructure presence surrounding the planned development. Refer to Figure 3 for existing pedestrian infrastructure. Segmented portions of sidewalk infrastructure exist along Talmadge Road to the east and west of US 41.

B.4. Transit and Bicycle Facilities

MARTA Bus Route 800 serves the Clayton County portion of the study area along US 41 with stops along Talmadge Road, US 41, and Lovejoy Road. The nearest transit stop is at the northeast corner of the intersection of US 41 and Talmadge Road, located approximately 1,000 feet from the proposed site, though currently there is no pedestrian access to the stop. Henry County recently created a new transit plan, but currently there are no plans for expansion to the study area. A bicycle-friendly road exists along Panhandle Road, which is located west of and adjacent to the proposed development on the western edge of Talmadge Lake. However, there is no striping on Panhandle Road for bicycle usage. Refer to Figure 4 for existing bicycle infrastructure and nearby transit stops.

Figure 3. Alternative Transportation Map – Pedestrian & Multi-Use Path Infrastructure

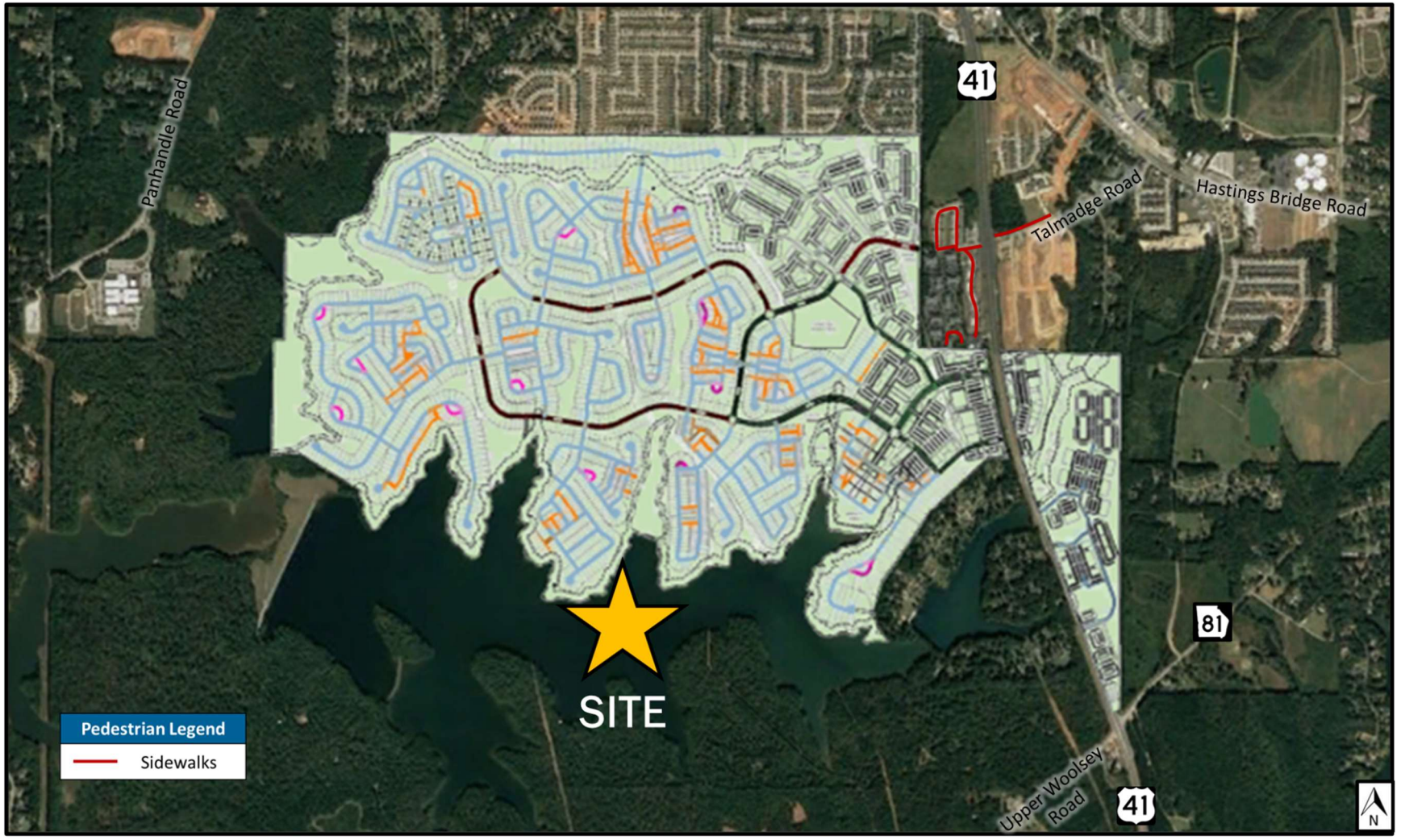
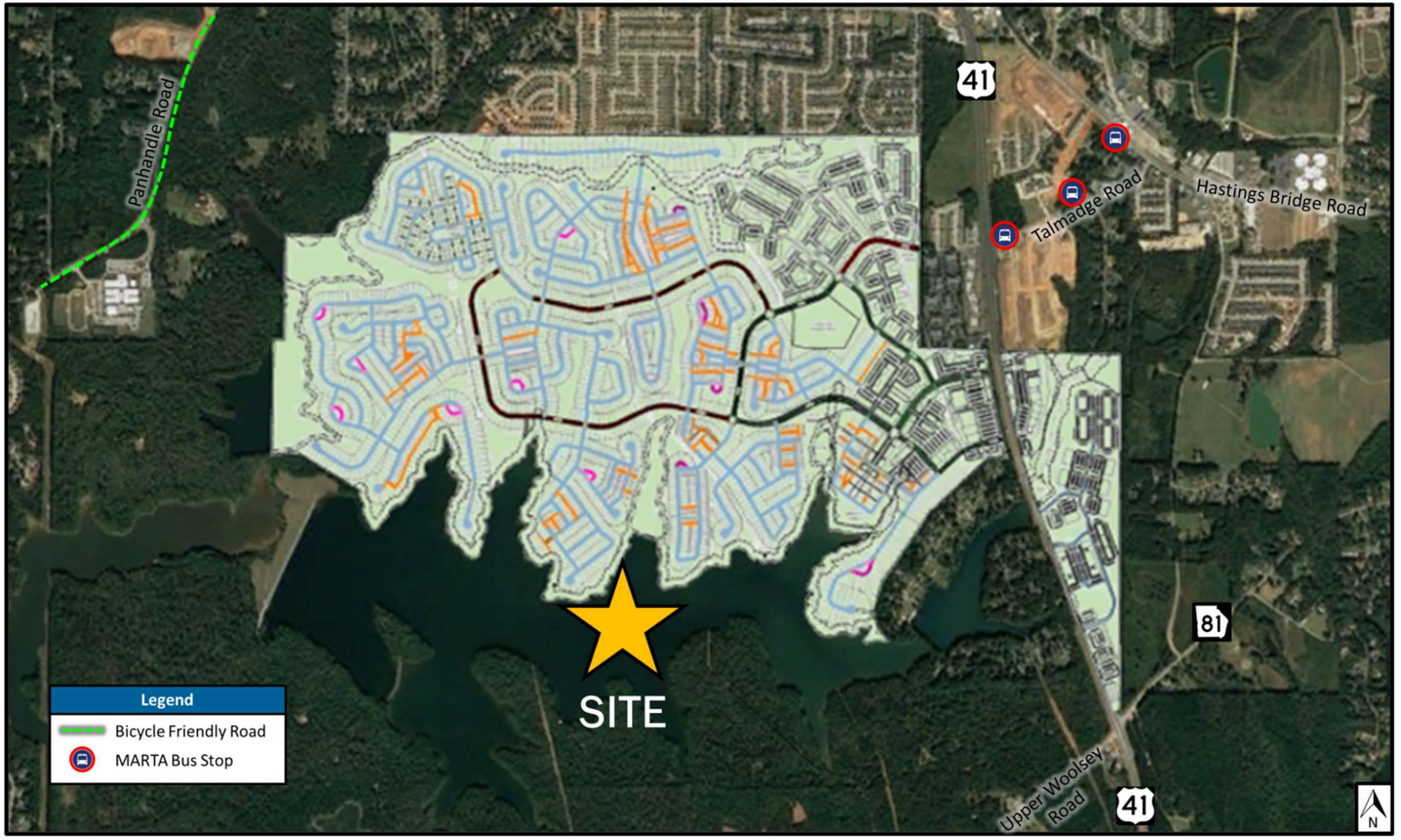


Figure 4. Alternative Transportation Map – Public Transit & Bicycle Infrastructure Services



B.5. Traffic Counts

Turning movement counts (TMCs) were collected on Wednesday, May 18, 2022, and Tuesday, February 28, 2023, at the study intersections. Also, 24-hour bi-directional counts were collected along US 41 north and south of its intersection with Talmadge Road. Average daily weekday traffic north and south of Talmadge Road is 33,130 and 32,380, respectively.

Traffic count data is provided in Appendix B and depicted in Figure 5: Existing Traffic Volumes.

Figure 5. Existing Traffic Volumes

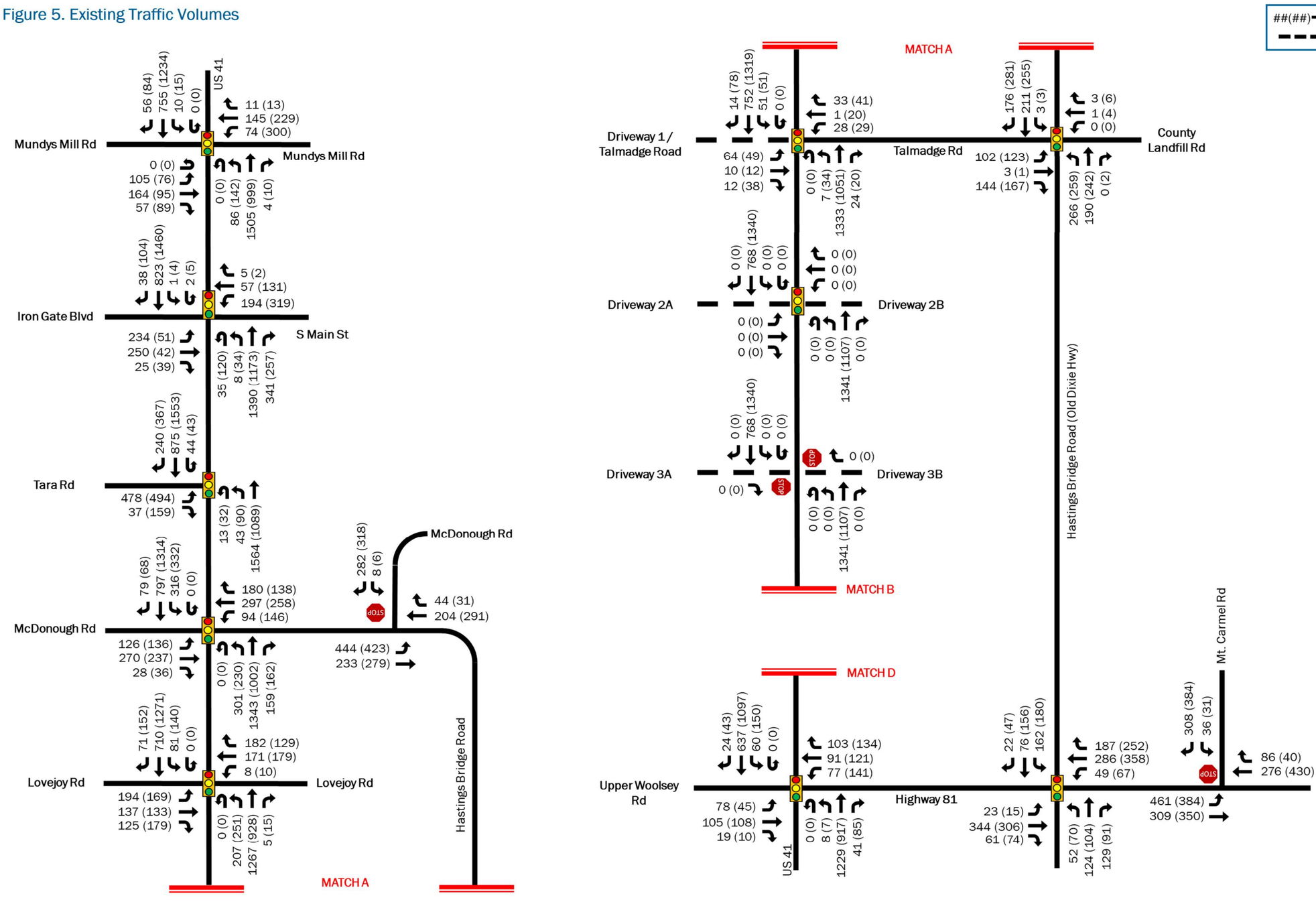
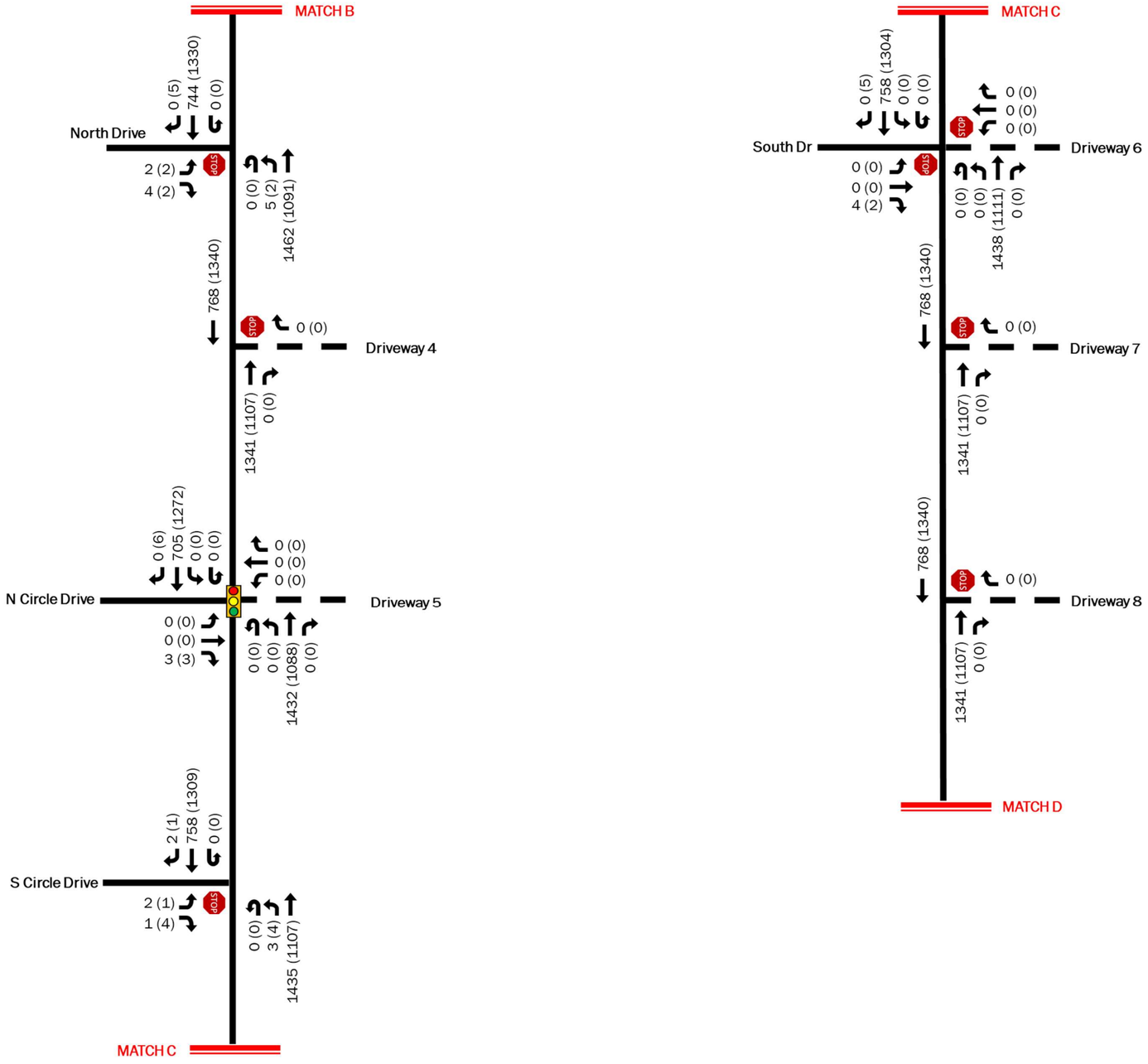


Figure 5: Existing Traffic Volumes (Continued)



C. Future Conditions

C.1. Background Growth

The growth rate in the study area is based on an analysis on historic traffic count data from the GDOT Traffic Analysis & Data Application (TADA). The project will be built out in five phases with phase 1 completion expected by 2028 and the complete development expected to be complete by 2048. To account for future traffic growth, the existing base year traffic volumes are grown by 2% develop the 2028 and 2048 No-Build and 2028 and 2048 Build traffic volumes. Historic traffic count data used in this analysis are provided in Appendix C.

Figure 6 depicts the 2028 No-Build traffic volumes. Figure 7 depicts the 2048 No-Build traffic volumes.

Figure 6. 2028 No-Build Traffic Volumes

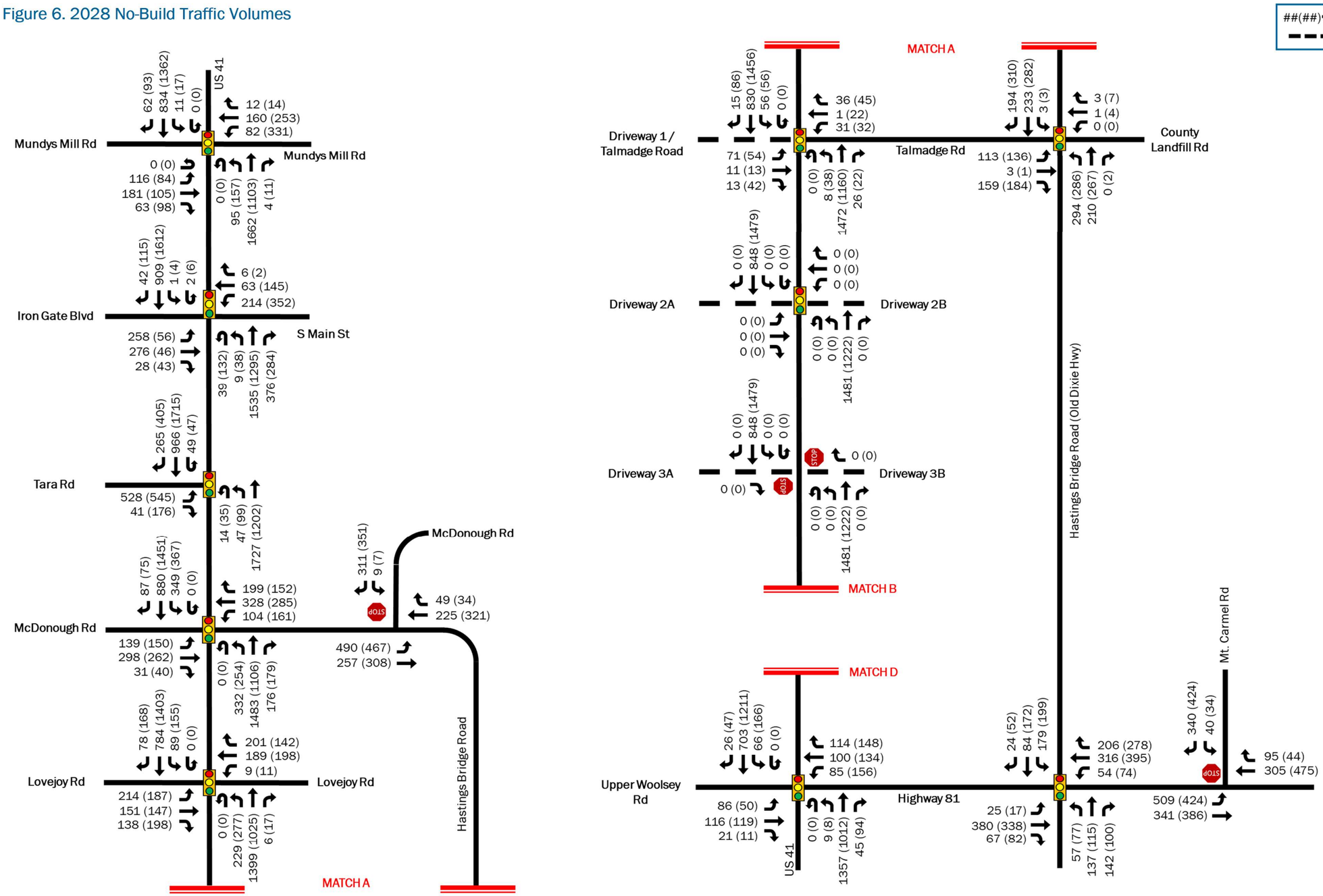


Figure 6: 2028 No-Build Traffic Volumes (Continued)

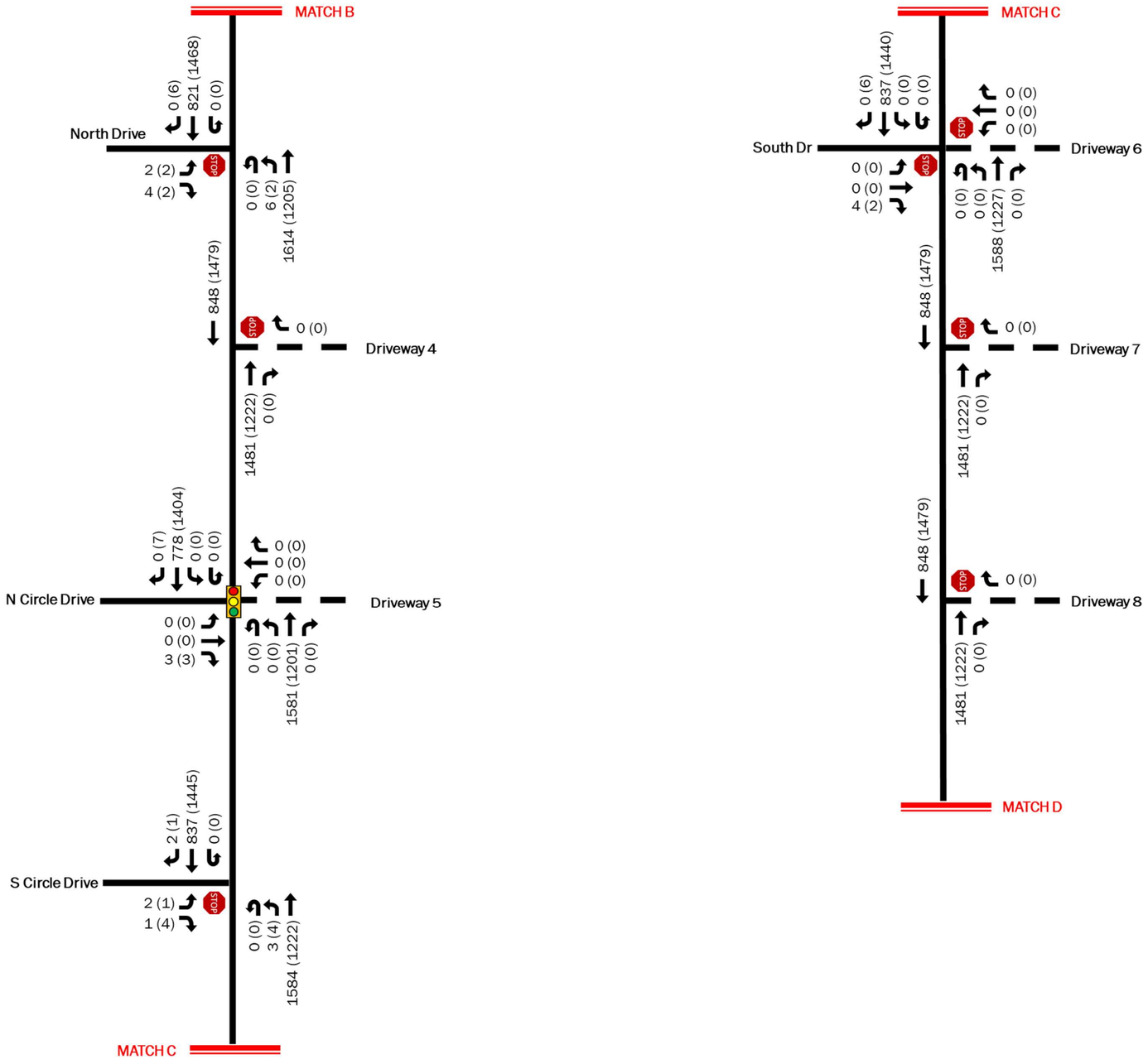


Figure 7. 2048 No-Build Traffic Volumes

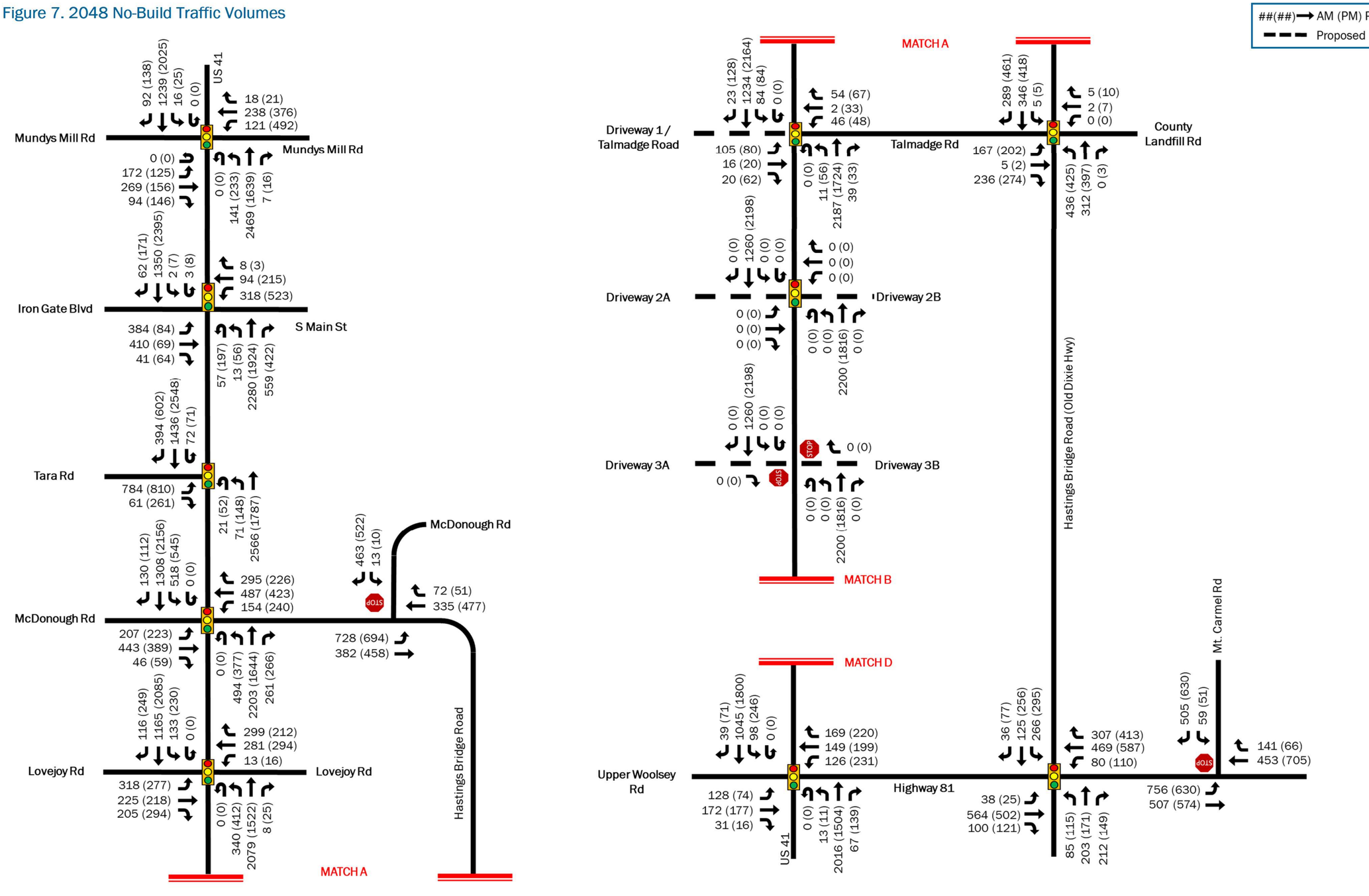


Figure 7: 2048 No-Build Traffic Volumes (Continued)

C.2. Project Trip Generation

Table 1 summarizes the project trip generation for phase 1 of the development calculated using the Institute of Transportation Engineers' (ITE) Trip Generation Manual, 11th Edition, 2021. Table 2 summarizes the project trip generation once phase 5 is completed. For phase 1, an internal capture of 20% was used, and in phase 5 the internal capture rate was changed to 15%. Pass-by rates for the commercial land uses are 5% for the daily volume, 15% for the AM Peak Hour, and 19% for the PM Peak Hour.

Table 1: Project Trip Generation (Phase 1)

LAND USE	PERIOD	TOTAL	IN	OUT
Single-Family Detached Housing, LUC 210 (492 Dwelling Units)	Daily	4,370	2,185	2,185
	AM Peak Hour	318	83	235
	PM Peak Hour	444	280	164
Single-Family Attached Housing, LUC 215 (110 Dwelling Units)	Daily	788	394	394
	AM Peak Hour	52	16	36
	PM Peak Hour	62	35	27
Multifamily Housing (Low-Rise), LUC 220 (752 Dwelling Units)	Daily	4,896	2,448	2,448
	AM Peak Hour	256	61	195
	PM Peak Hour	344	217	127
Senior-Adult Housing – Single Family, LUC 251 (78 Dwelling Units)	Daily	480	240	240
	AM Peak Hour	32	11	21
	PM Peak Hour	37	23	14
Shopping Center (>150K), LUC 820 (525,000 Sq. Ft.)	Daily	19,572	9,786	9,786
	AM Peak Hour	443	275	168
	PM Peak Hour	1,862	894	968
Shopping Plaza (40-150K), LUC 821 (100,000 Sq. Ft.)	Daily	6,752	3,376	3,376
	AM Peak Hour	173	107	66
	PM Peak Hour	519	254	265
Total Gross Trips	Daily	36,858	18,429	18,429
	AM Peak Hour	1,274	553	721
	PM Peak Hour	3,268	1,703	1,565
Commercial Pass-by Trips	Daily	-1,316	-658	-658
	AM Peak Hour	-102	-51	-51
	PM Peak Hour	-562	-281	-281
Internal Capture	Daily	-7,372	-3,686	-3,686
	AM Peak Hour	-256	-111	-145
	PM Peak Hour	-584	-307	-277
Total Net Trips	Daily	28,170	14,085	14,085
	AM Peak Hour	916	391	525
	PM Peak Hour	2,122	1,115	1,007

When phase 1 of the development is complete, the development will generate a total of 916 new trips (391 entering and 525 exiting) in the AM peak hour and 2,122 new trips (1,115 entering and 1,007 exiting) in the PM peak hour.

Table 2: Project Trip Generation (Phase 5)

LAND USE	PERIOD	TOTAL	IN	OUT
Single-Family Detached Housing, LUC 210 (2,460 Dwelling Units)	Daily	19,212	9,606	9,606
	AM Peak Hour	1,374	357	1,017
	PM Peak Hour	2,017	1,271	746
Single-Family Attached Housing, LUC 215 (554 Dwelling Units)	Daily	4,172	2,086	2,086
	AM Peak Hour	282	87	195
	PM Peak Hour	328	187	141
Multifamily Housing (Low-Rise), LUC 220 (3,760 Dwelling Units)	Daily	24,176	12,088	12,088
	AM Peak Hour	1,188	285	903
	PM Peak Hour	1,637	1,031	606
Senior-Adult Housing – Single Family, LUC 251 (386 Dwelling Units)	Daily	1,868	934	934
	AM Peak Hour	108	36	72
	PM Peak Hour	127	77	50
Hotel, LUC 310 (180 Rooms)	Daily	1,528	764	764
	AM Peak Hour	83	46	37
	PM Peak Hour	105	54	551
Shopping Center (>150K), LUC 820 (1,990,000 Sq. Ft.)	Daily	57,822	28,911	28,911
	AM Peak Hour	1,308	811	497
	PM Peak Hour	4,861	2,333	2,528
Shopping Plaza (40-150K) LUC 821, (Without Supermarket) (100,000 Sq. Ft.)	Daily	6,752	3,376	3,376
	AM Peak Hour	173	107	66
	PM Peak Hour	519	254	265
Total Gross Trips	Daily	115,530	57,765	57,765
	AM Peak Hour	4,516	1,729	2,787
	PM Peak Hour	9,594	5,207	4,387
Commercial Pass-by Trips	Daily	-3,230	-1,615	-1,615
	AM Peak Hour	-232	-116	-116
	PM Peak Hour	-1,132	-566	-566
Internal Capture	Daily	-17,330	-8,665	-8,665
	AM Peak Hour	-679	-260	-419
	PM Peak Hour	-1,302	-715	-587
Total Net Trips	Daily	94,970	47,485	47,485
	AM Peak Hour	3,605	1,353	2,252
	PM Peak Hour	7,160	3,926	3,234

When fully built-out, the development will generate a total of 3,605 new trips (1,353 entering and 2,252 exiting) in the AM peak hour and 7,160 new trips (3,926 entering and 3,234 exiting) in the PM peak hour.

C.3. Trip Distribution and Assignment

The assignment and directional distribution of new project trips is based on existing traffic patterns observed in the overall study area and based on a collaboration with the Georgia Regional Transportation Authority (GRTA) and Georgia Department of Transportation (GDOT) during the DRI MMP Meetings held for this development.

From the trips generated, the following distribution of traffic is expected through the site:

Personal Vehicle (Auto) Trips

- 10% of traffic will enter and exit the site from the north via US 41.
- 5% of traffic will enter and exit the site from the north via Mundy's Mill Road.
- 5% of traffic will enter and exit the site from the north via S Main Street.
- 10% of traffic will enter and exit the site from the northwest via McDonough Road.
- 20% of traffic will enter and exit the site from the northeast via McDonough Road.
- 15% of traffic will enter and exit the site from the south via US 41.
- 15% of traffic will enter and exit the site from the southeast via Mt. Carmel Road
- 20% of traffic will enter and exit the site from the southeast via SR 81.

Figures 8 and 9 depict the Trip Distributions for personal vehicles and pass-by trips, respectively.

Figures 10 and 11 depict the Trip Assignments for phase 1 of the development, separated by trip types, based on the trip distributions shown in Figures 8 and 9. Figure 12 depicts the Total Combined Project Trips for phase 1 of the development.

Figures 13 and 14 depict the Trip Assignments for the separated trip types once the development is fully built out, based on the same trip distributions shown in Figures 8 and 9. Figure 15 depicts the Total Combined Project Trips for the completed development.

Figures 16 and 17 depicts the 2028 and 2048 Build Traffic Volumes for the site (No Build + Total Combined Project Trips), respectively.

Figure 8. Site Traffic Distribution, Personal Vehicle Trips

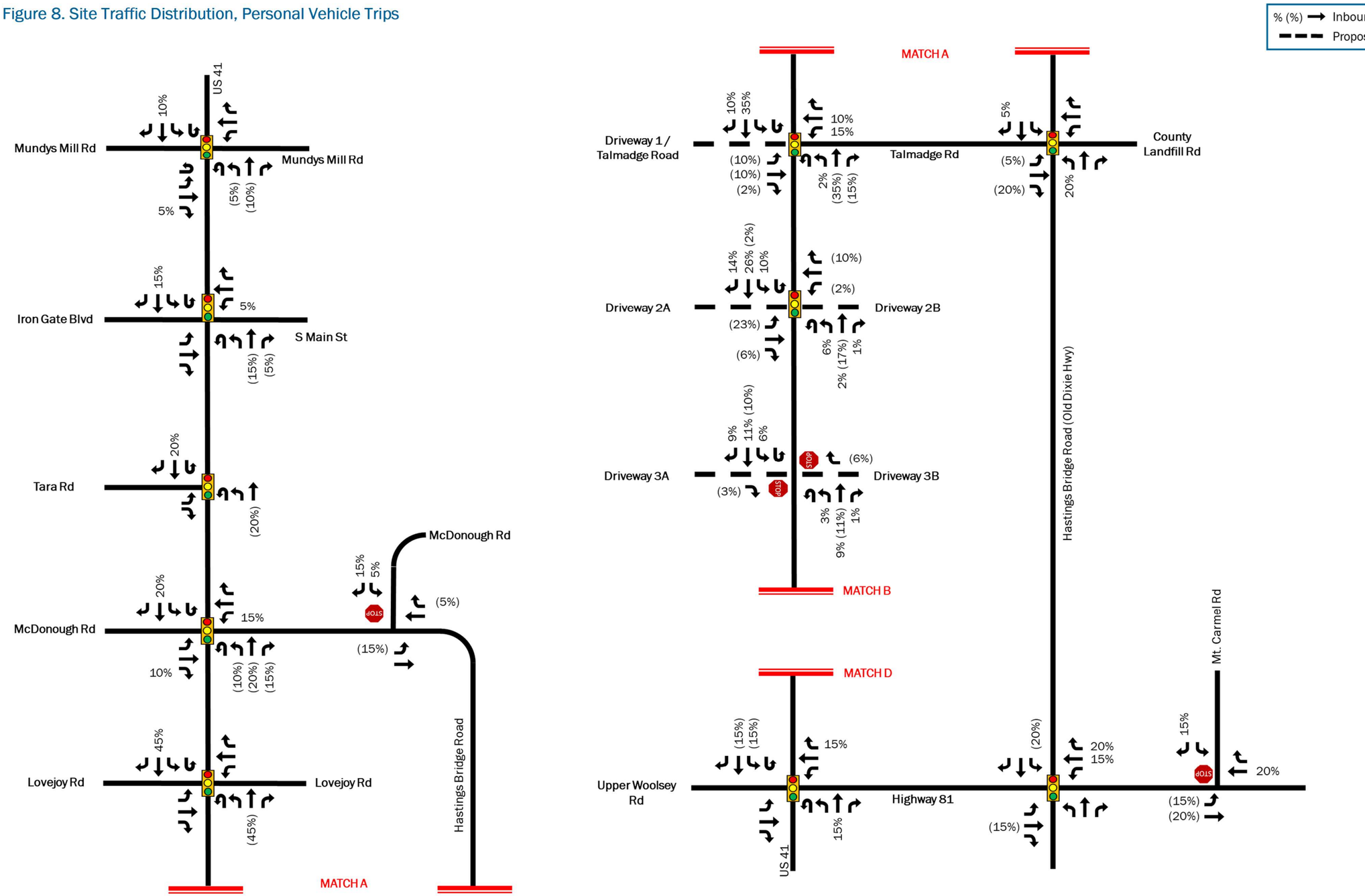


Figure 8: Site Traffic Distribution, Personal Vehicle Trips (Continued)

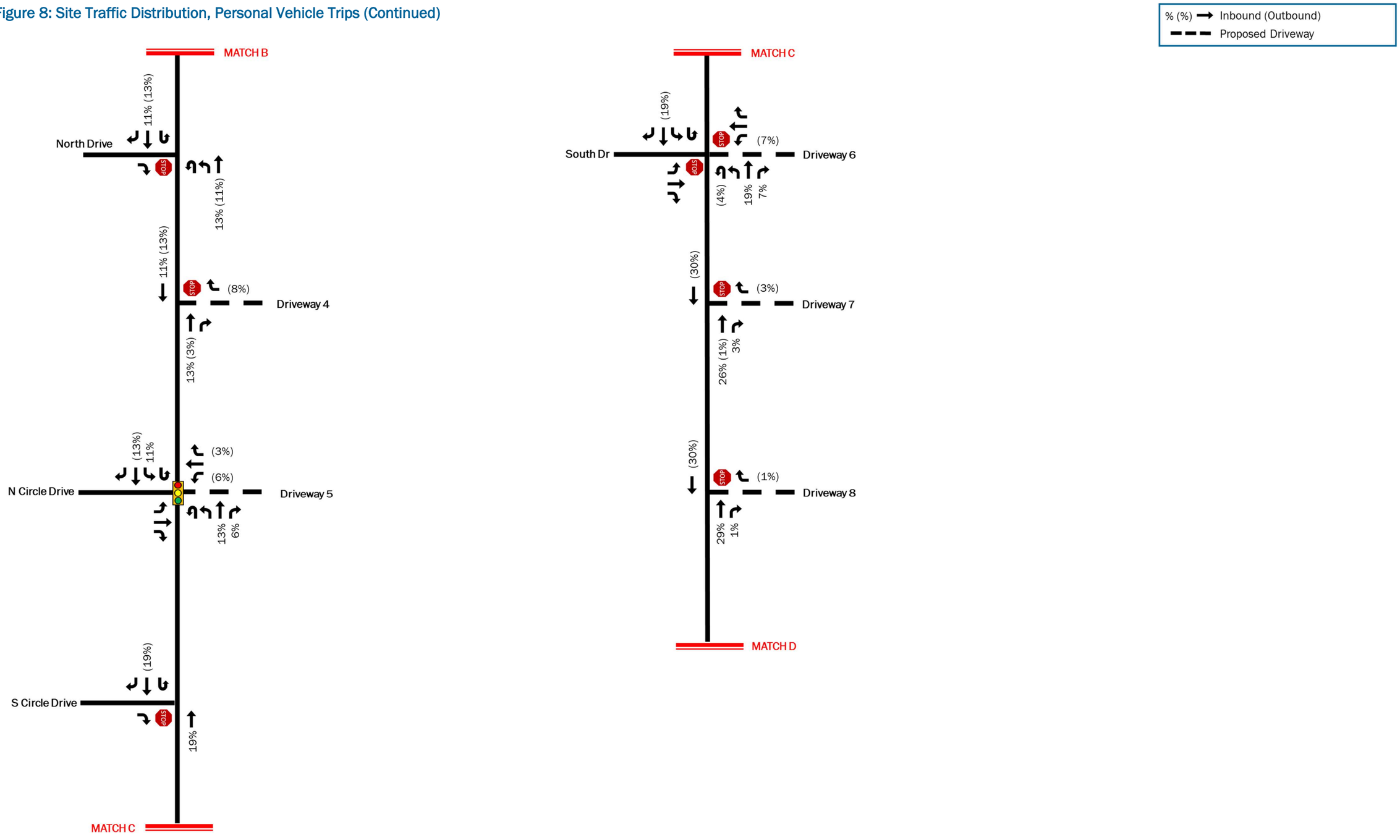


Figure 9. Site Traffic Distribution, Pass-By Trips

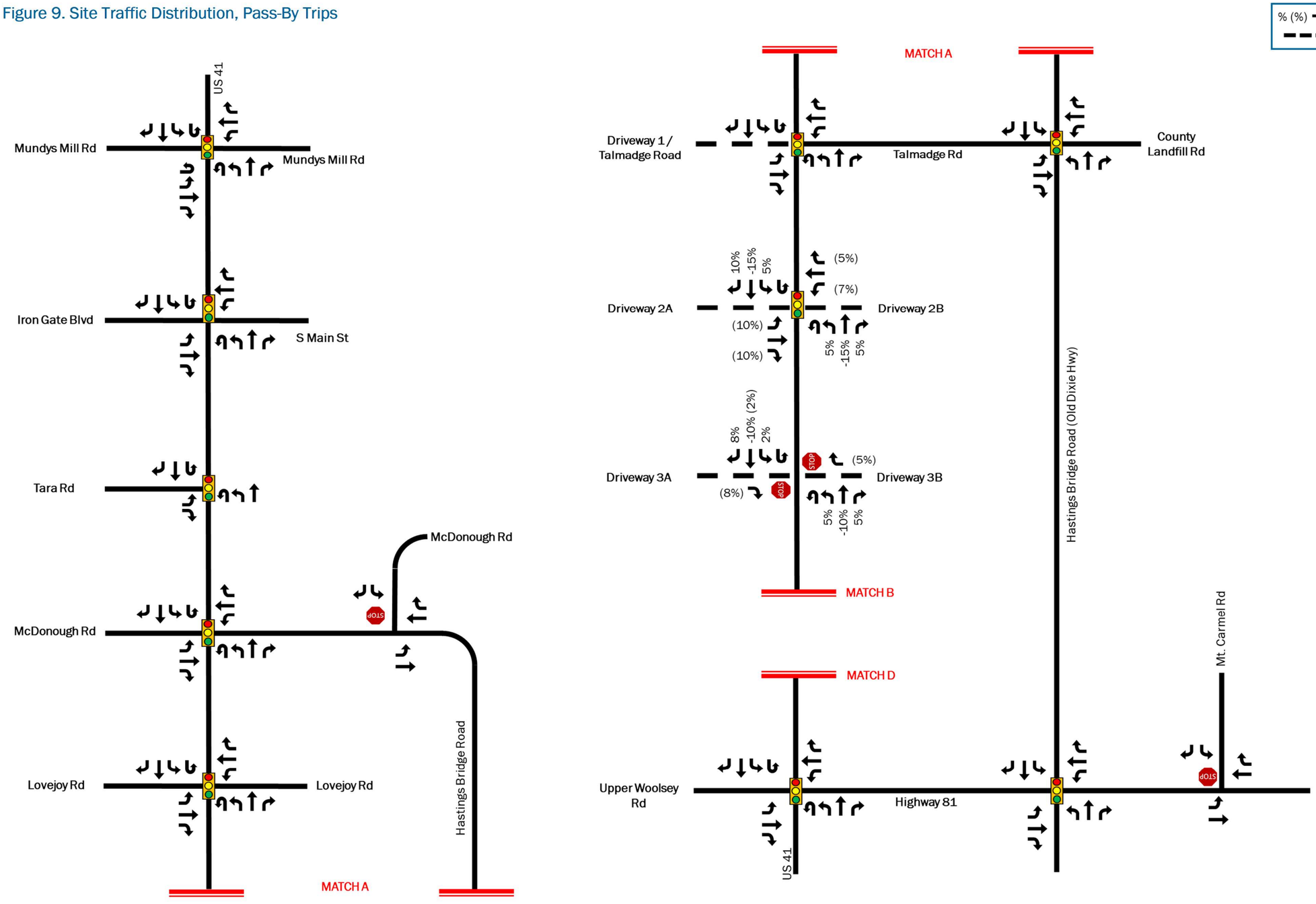


Figure 9: Site Traffic Distribution, Pass-By Trips (Continued)

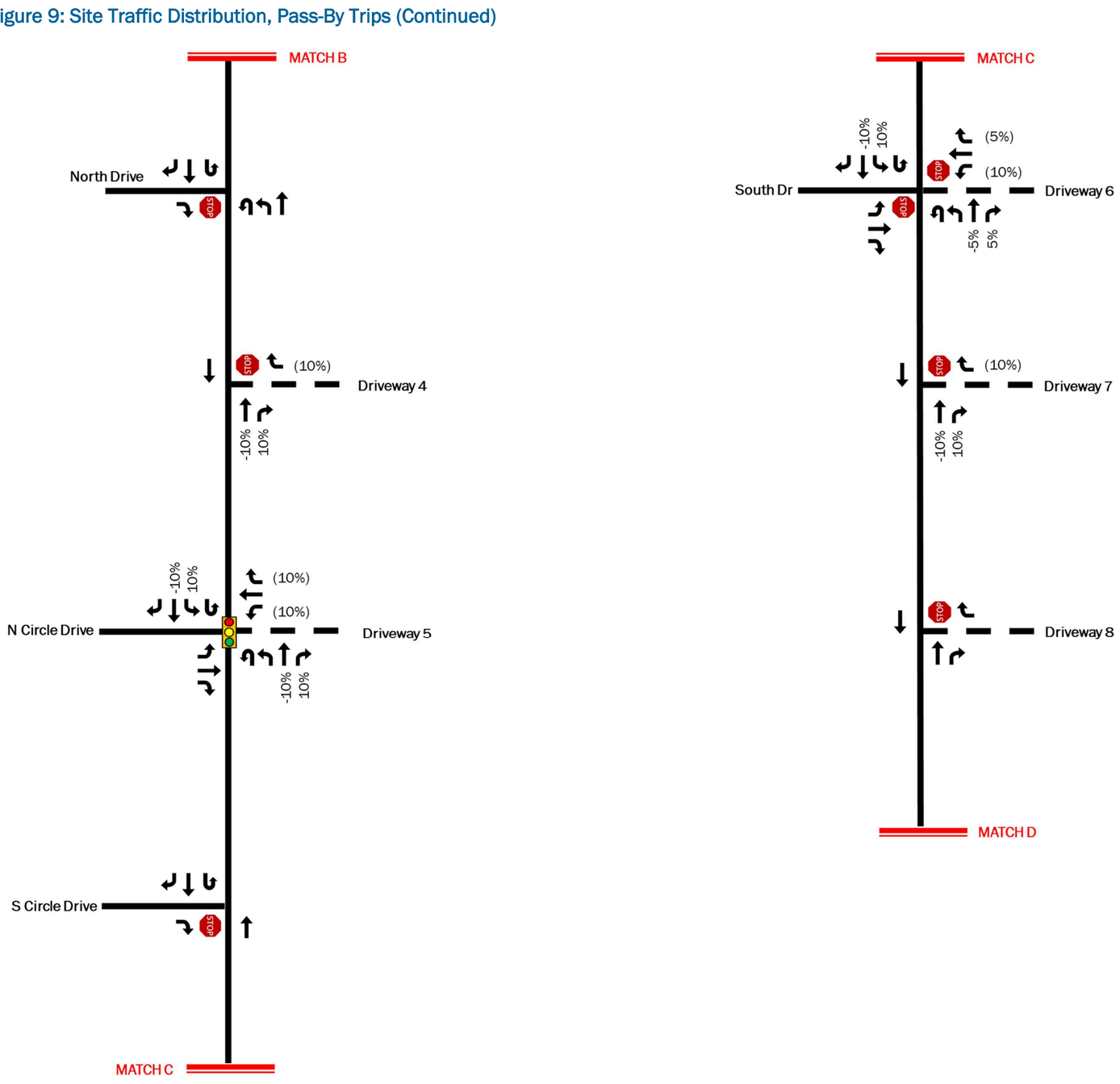


Figure 10. Trip Assignment, Personal Vehicles (Phase 1)

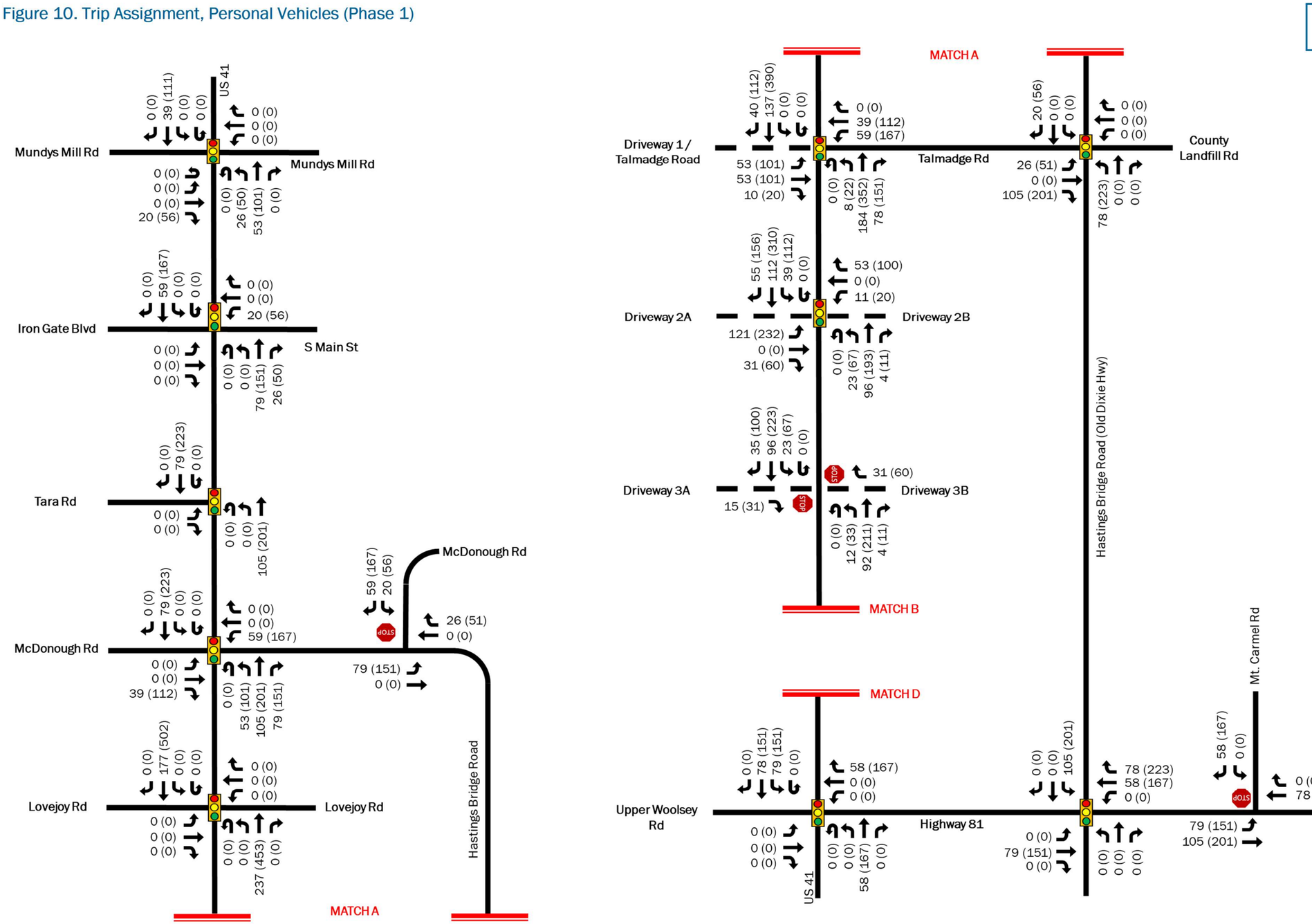
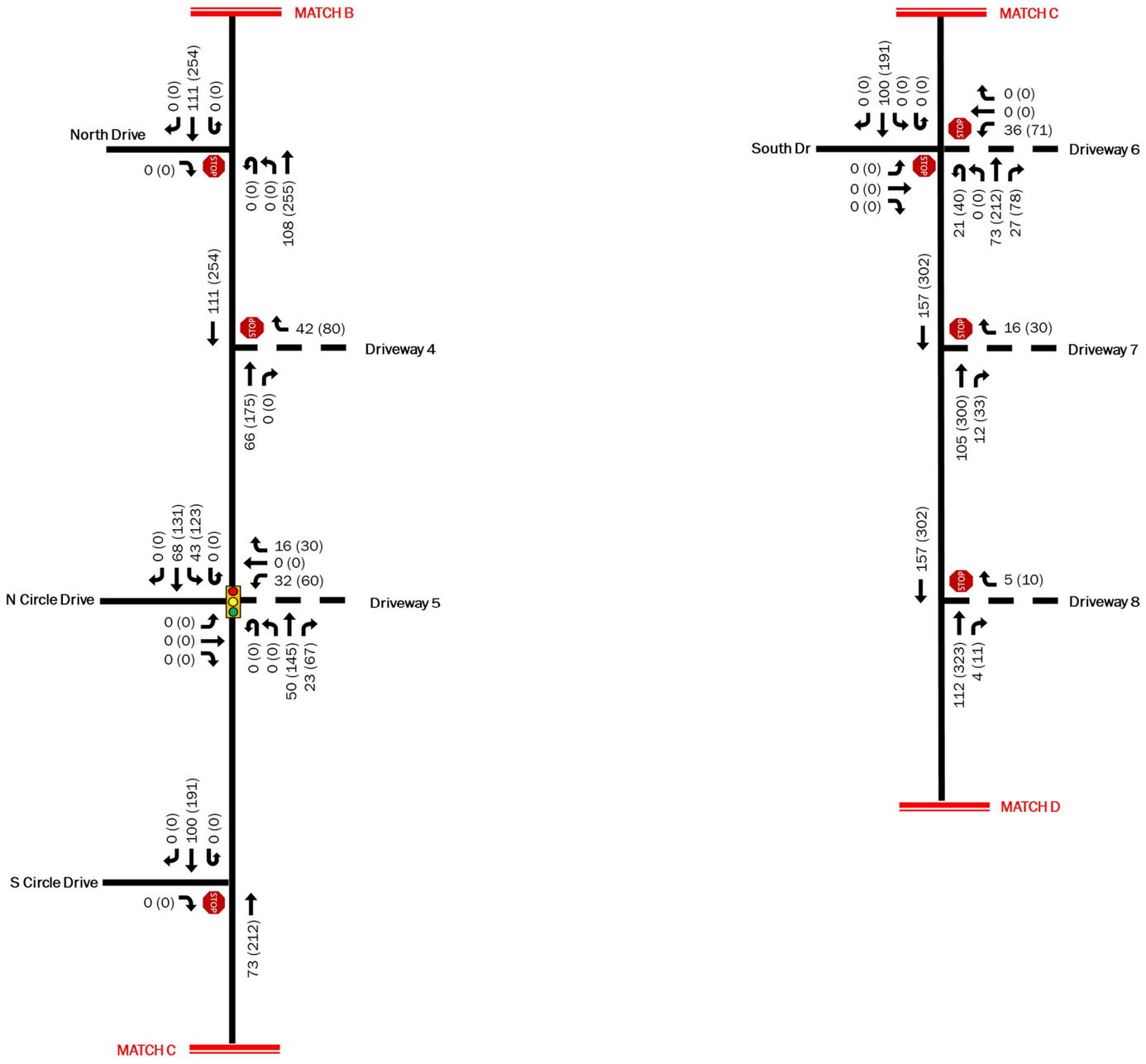


Figure 10: Trip Assignment, Personal Vehicles (Phase 1) (Continued)



##(##)→ AM (PM) Peak Hour Traffic Volume
Proposed Driveway

Trip Generation	Total	IN	OUT
AM Peak Hour	916	391	525
PM Peak Hour	2,122	1,115	1,007

Figure 11. Trip Assignment, Pass-By (Phase 1)

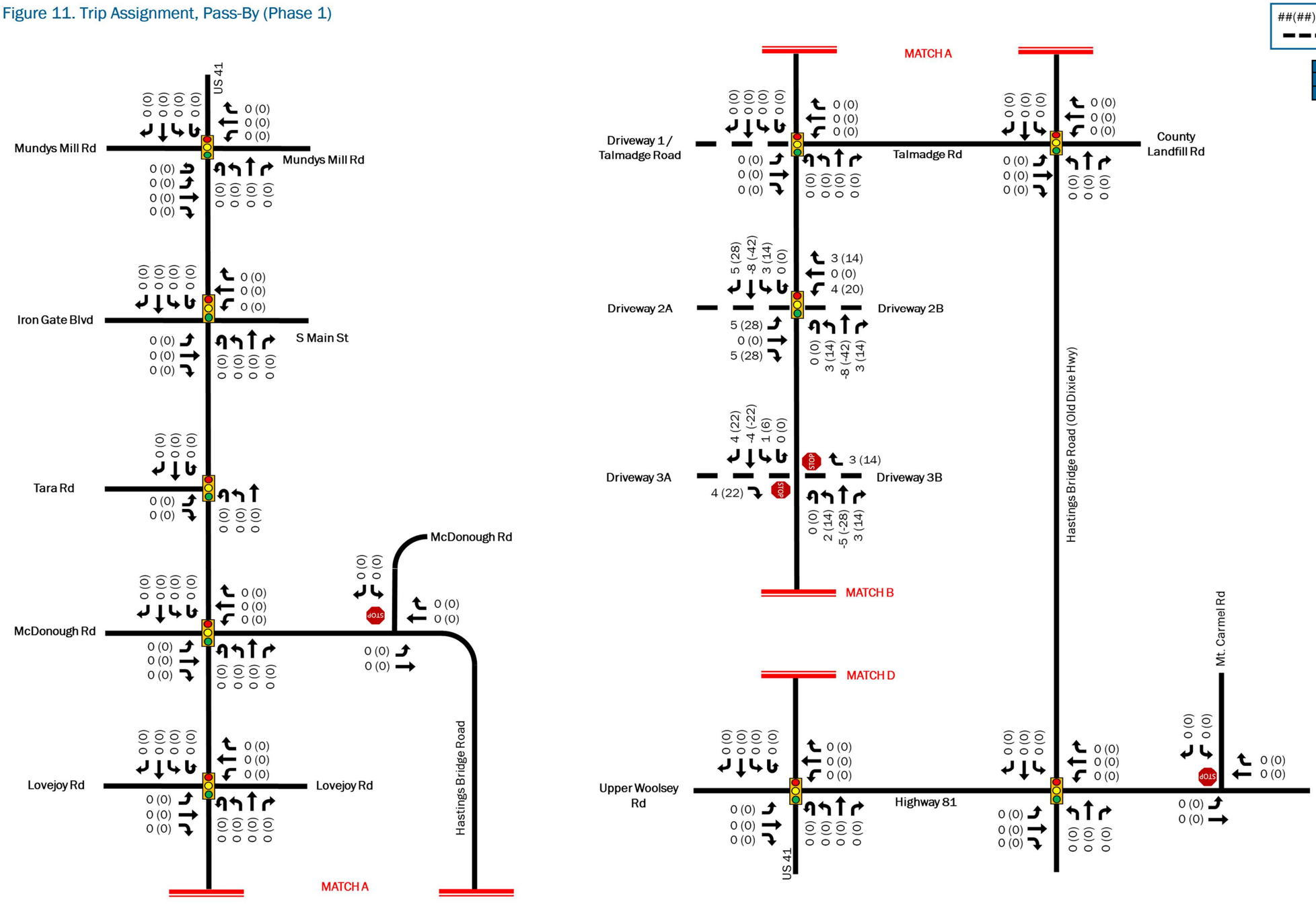
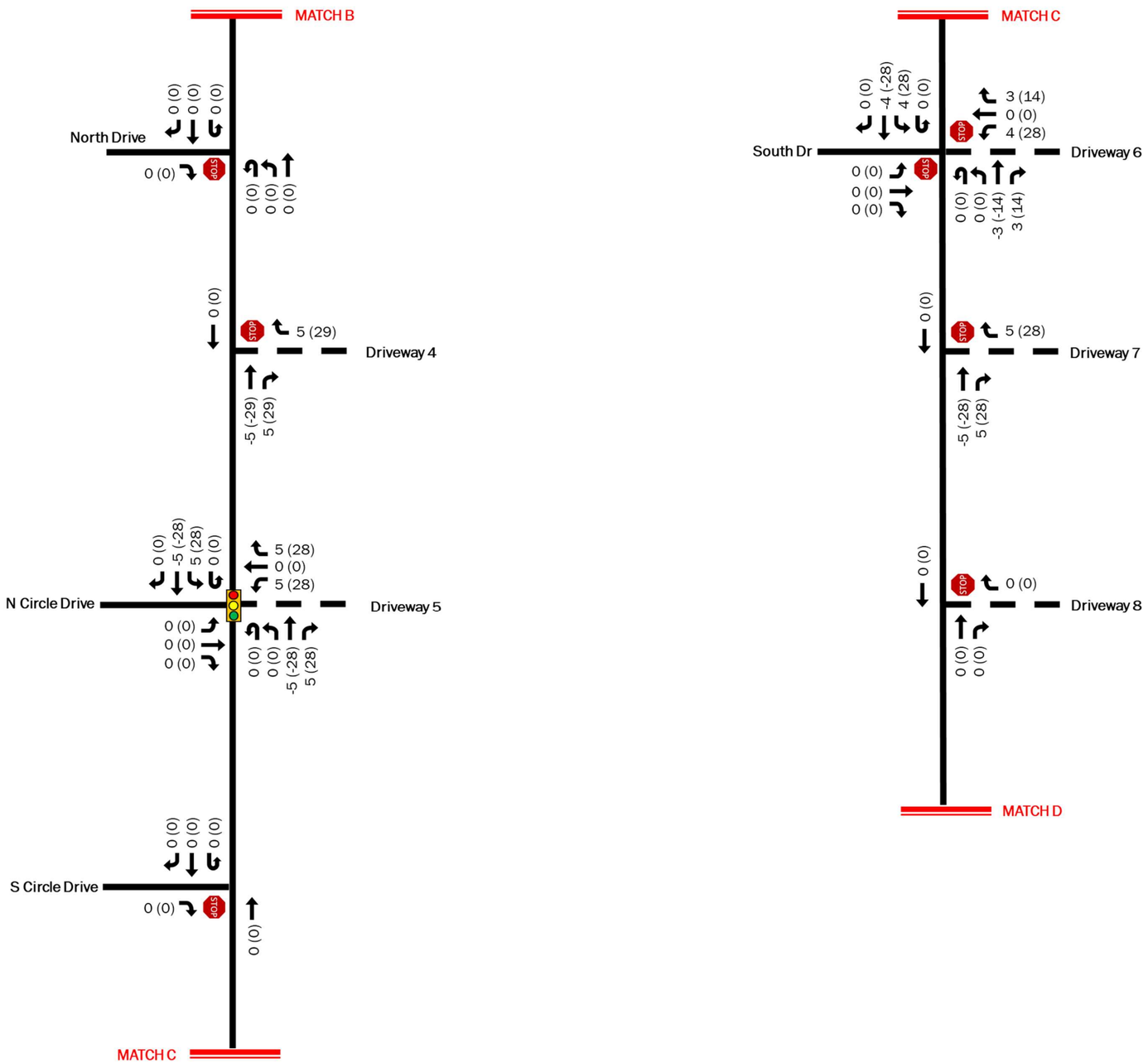


Figure 11: Trip Assignment, Pass-By (Phase 1) (Continued)



##(##)→ AM (PM) Peak Hour Traffic Volume

Proposed Driveway

Trip Generation	Total	IN	OUT
AM Peak Hour	102	51	51
PM Peak Hour	562	281	281

Figure 12. Trip Assignment, Total Site Traffic (Phase 1)

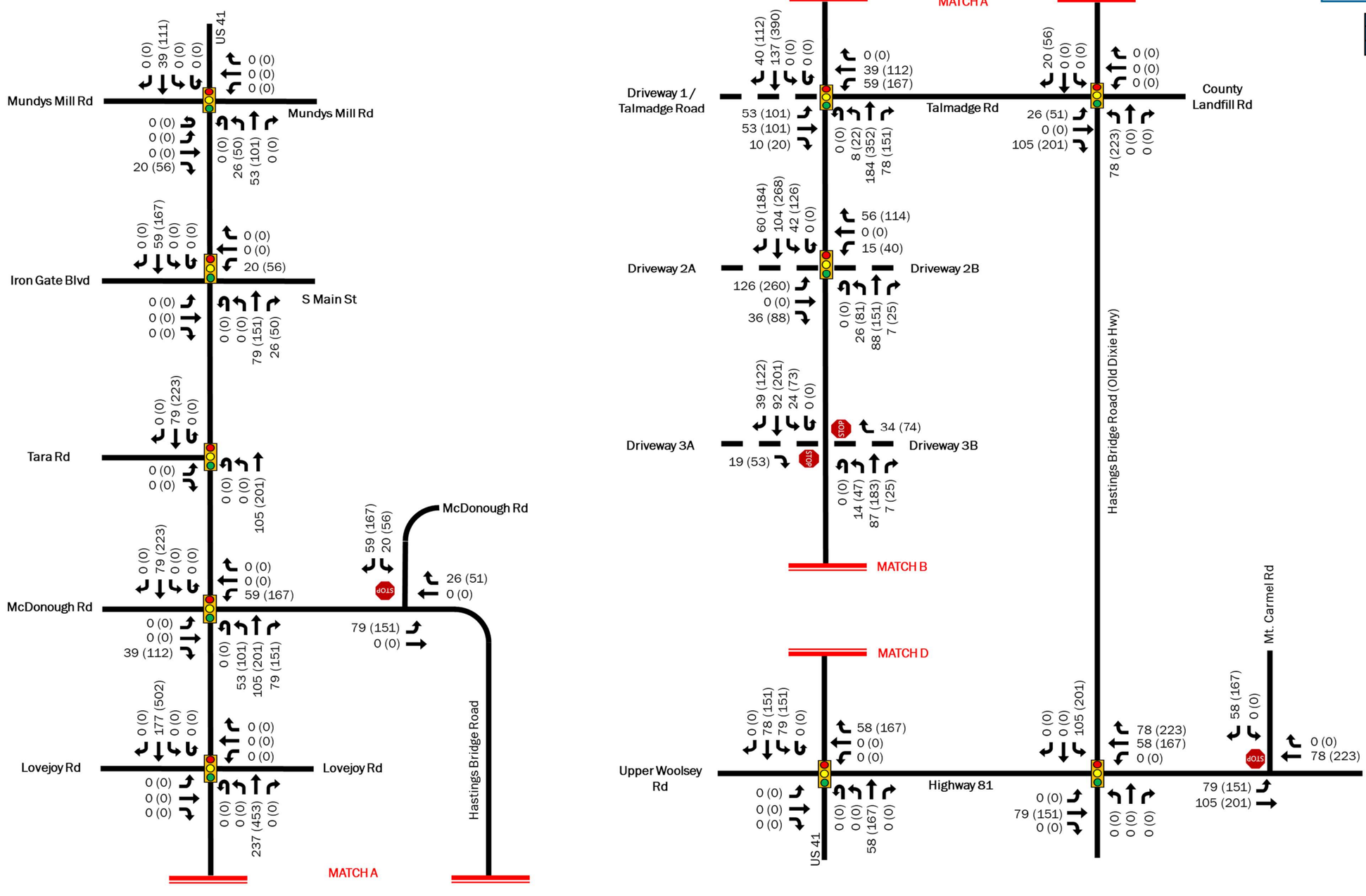


Figure 12: Trip Assignment, Total Site Traffic (Phase 1) (Continued)

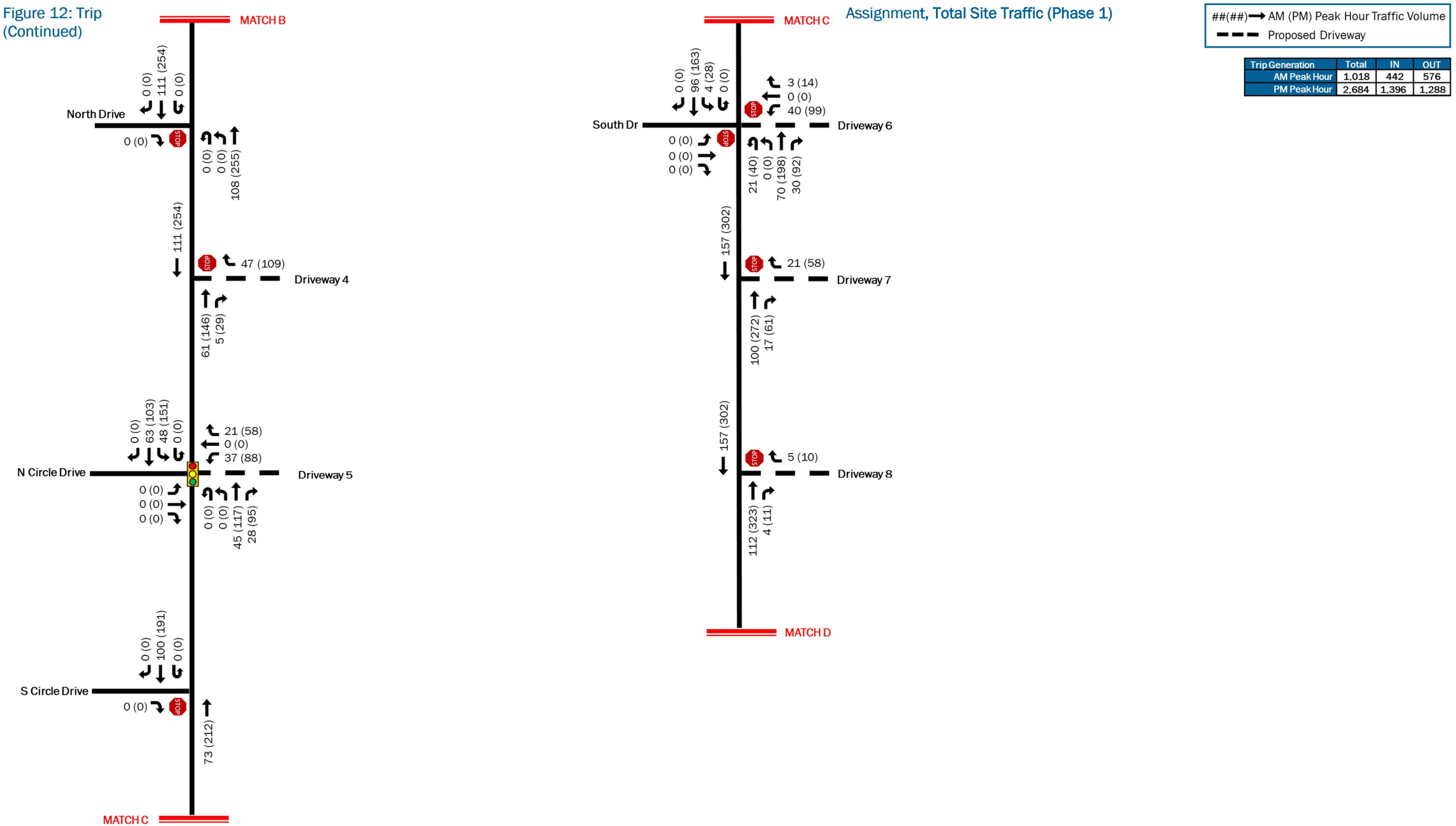


Figure 13. Trip Assignment, Personal Vehicles (Phase 5)

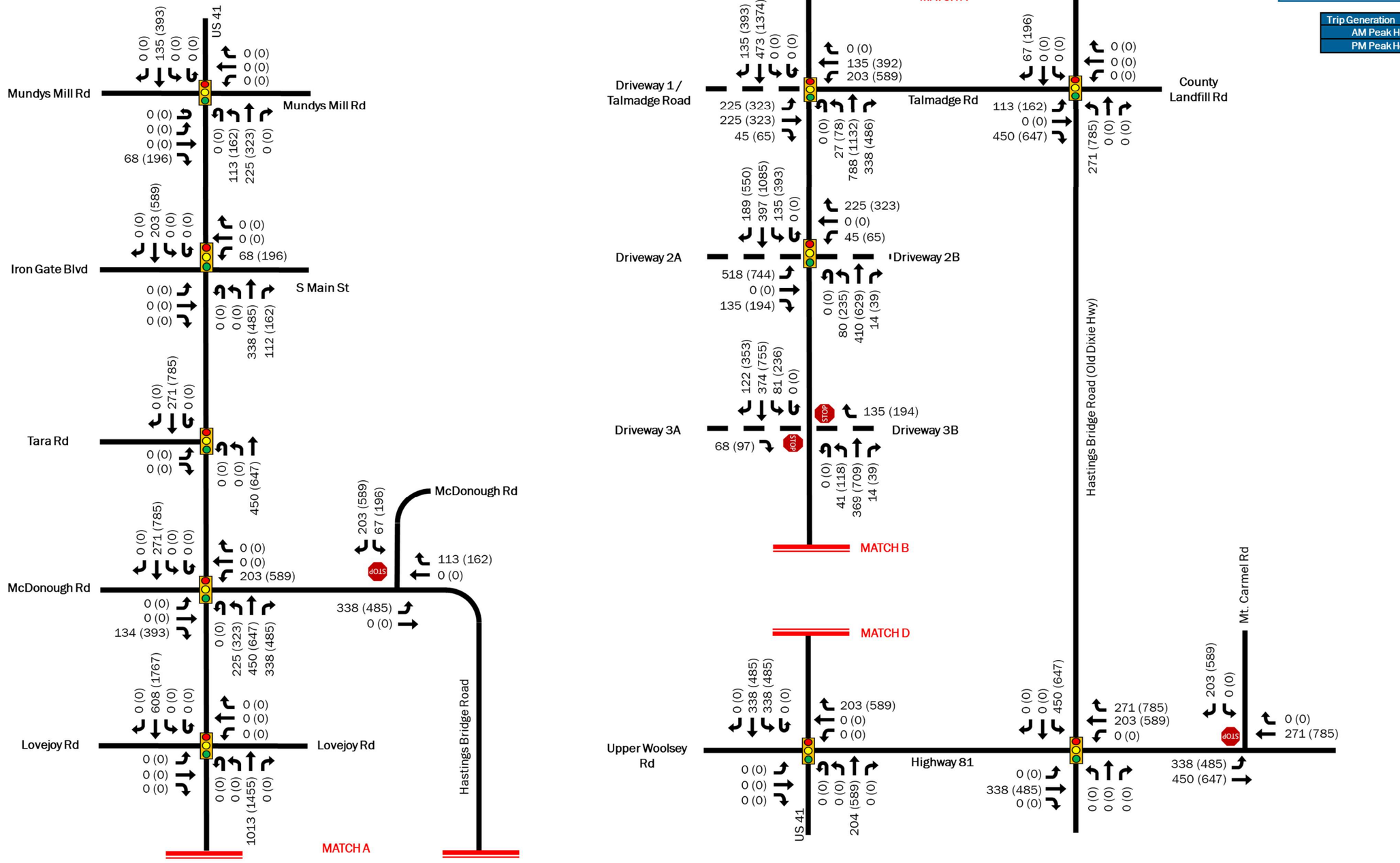
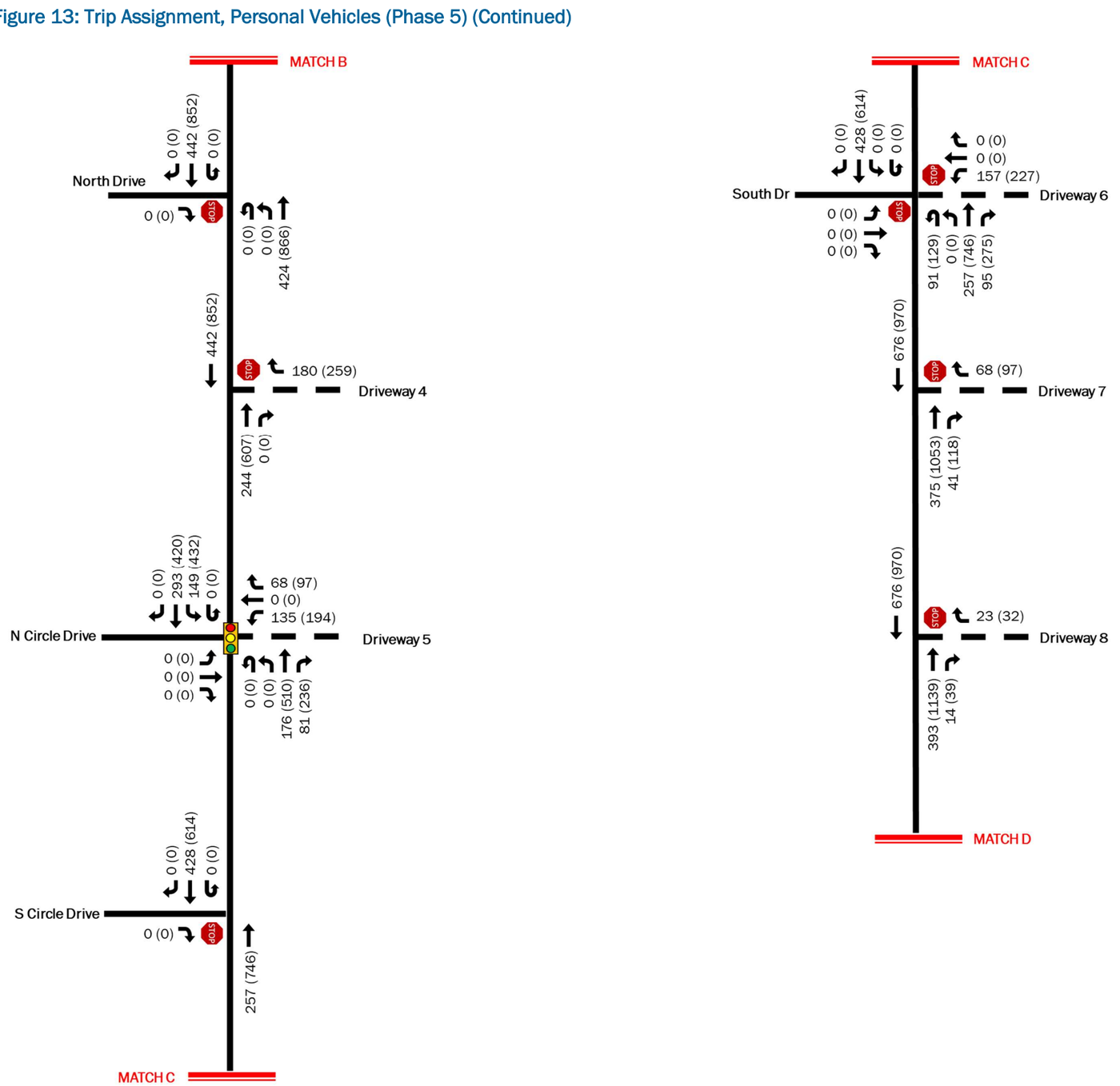


Figure 13: Trip Assignment, Personal Vehicles (Phase 5) (Continued)



##(##)→ AM (PM) Peak Hour Traffic Volume
Proposed Driveway

Trip Generation	Total	IN	OUT
AM Peak Hour	3,605	1,353	2,252
PM Peak Hour	7,160	3,926	3,234

Figure 14. Trip Assignment, Pass-By (Phase 5)

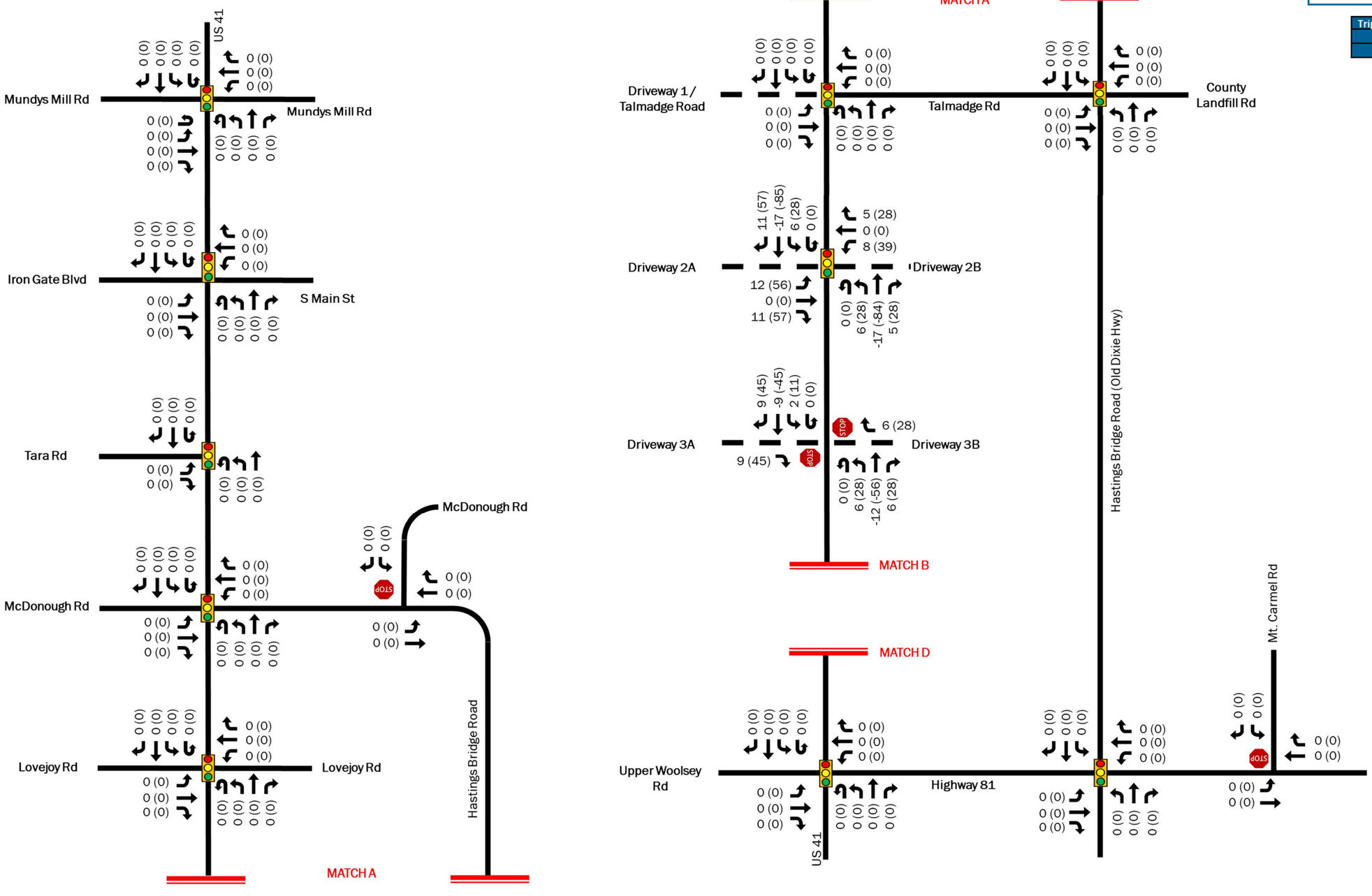
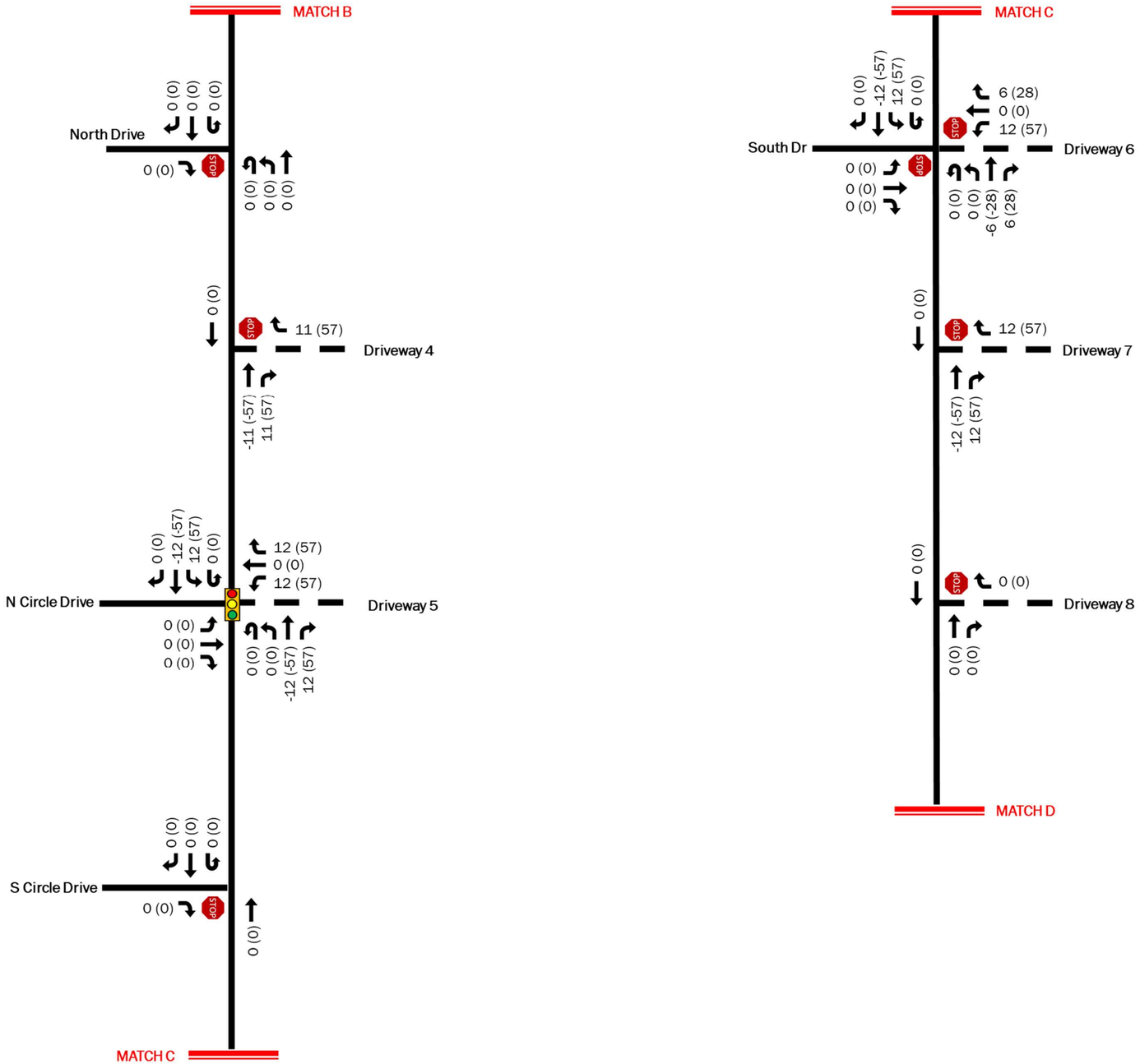


Figure 14: Trip Assignment, Pass-By (Phase 5) (Continued)



##(##)→ AM (PM) Peak Hour Traffic Volume

Proposed Driveway

Trip Generation	Total	IN	OUT
AM Peak Hour	232	116	116
PM Peak Hour	1,132	566	566

Figure 15. Trip Assignment, Total Site Traffic (Phase 5)

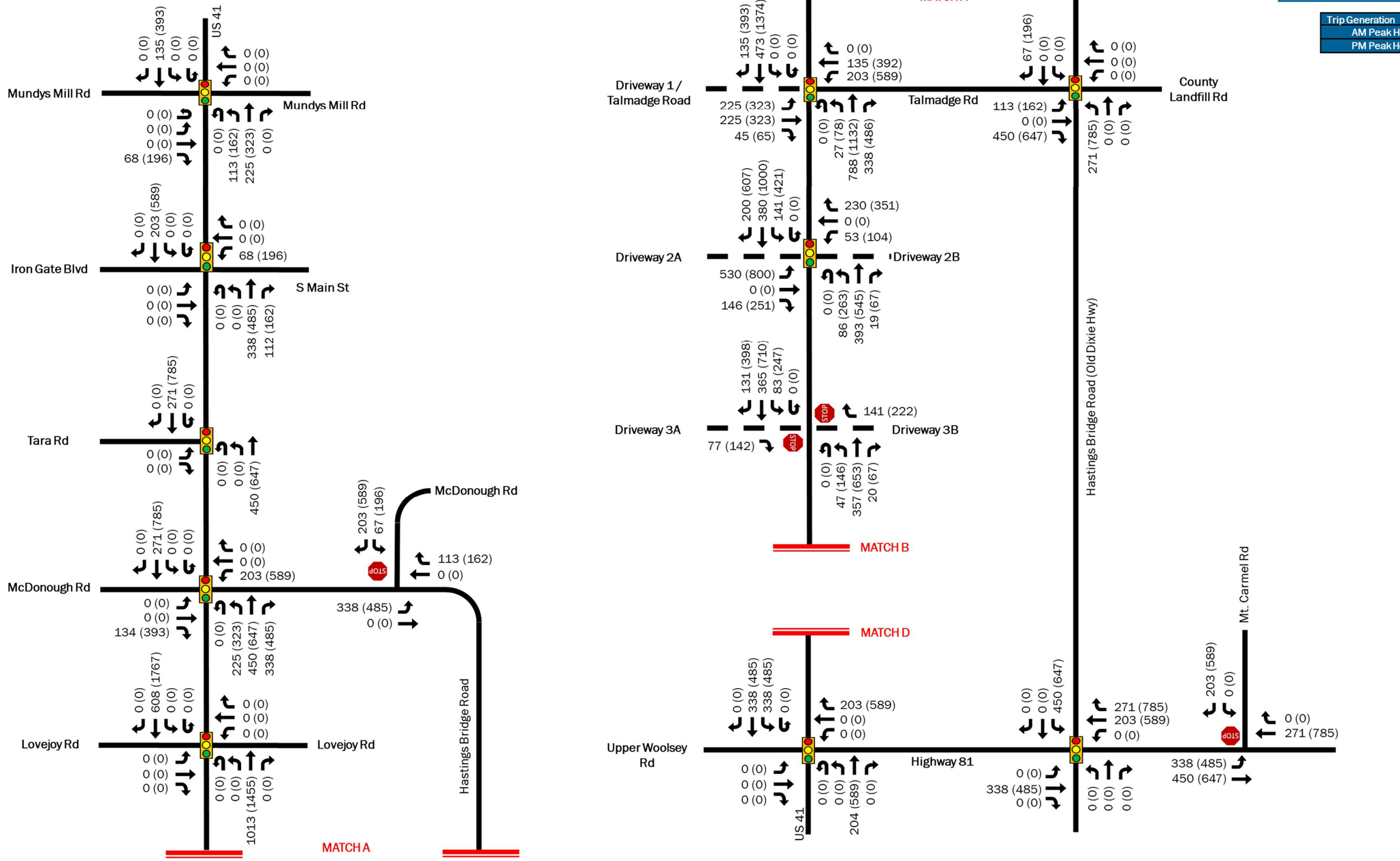
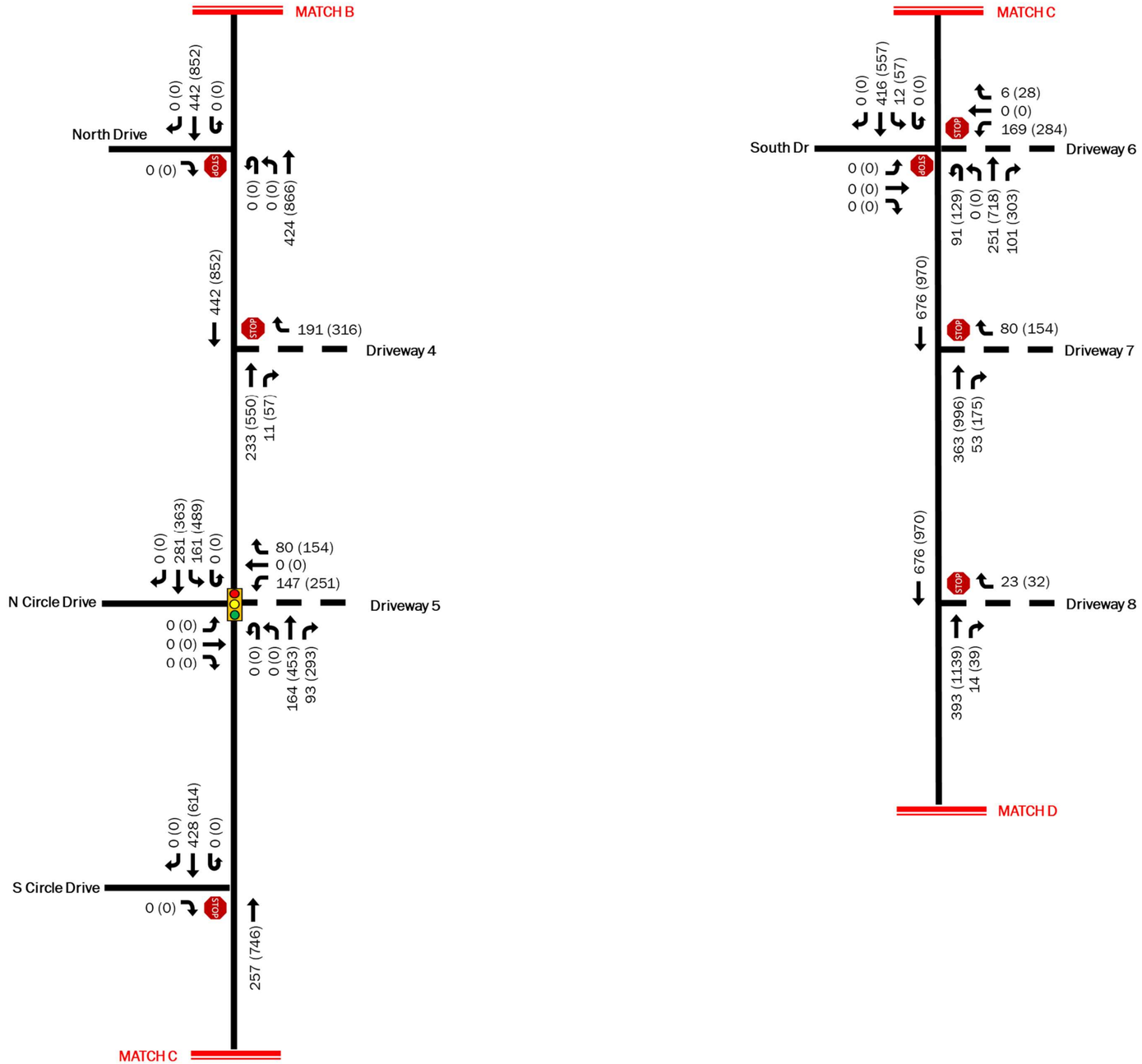


Figure 15: Trip Assignment, Total Site Traffic (Phase 5) (Continued)



##(##)→ AM (PM) Peak Hour Traffic Volume

Proposed Driveway

Trip Generation	Total	IN	OUT
AM Peak Hour	3,837	1,469	2,368
PM Peak Hour	8,292	4,492	3,800

Figure 16. 2028 Build Traffic Volumes

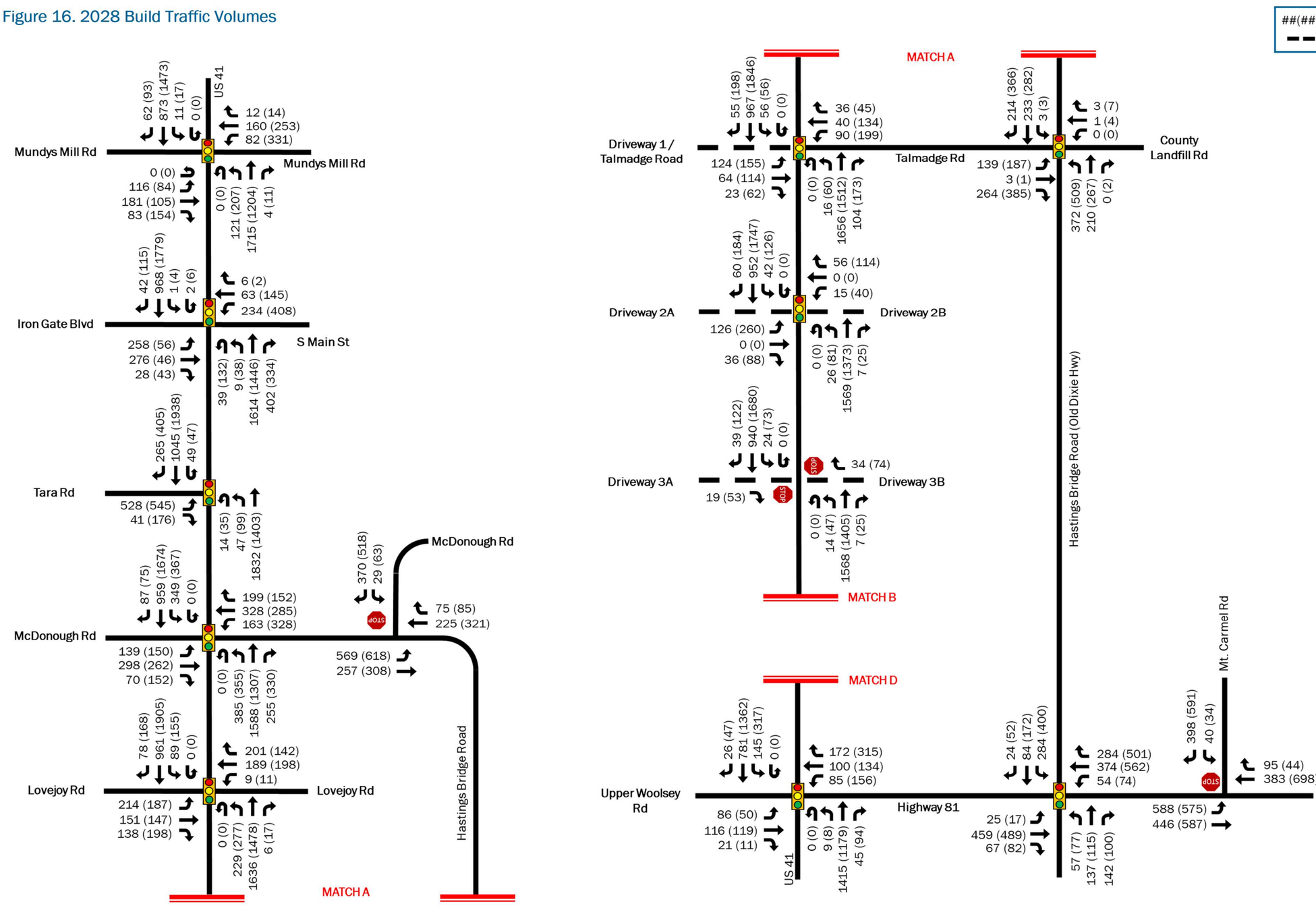


Figure 16: 2028 Build Traffic Volumes (Continued)

Figure 17. 2048 Build Traffic Volumes

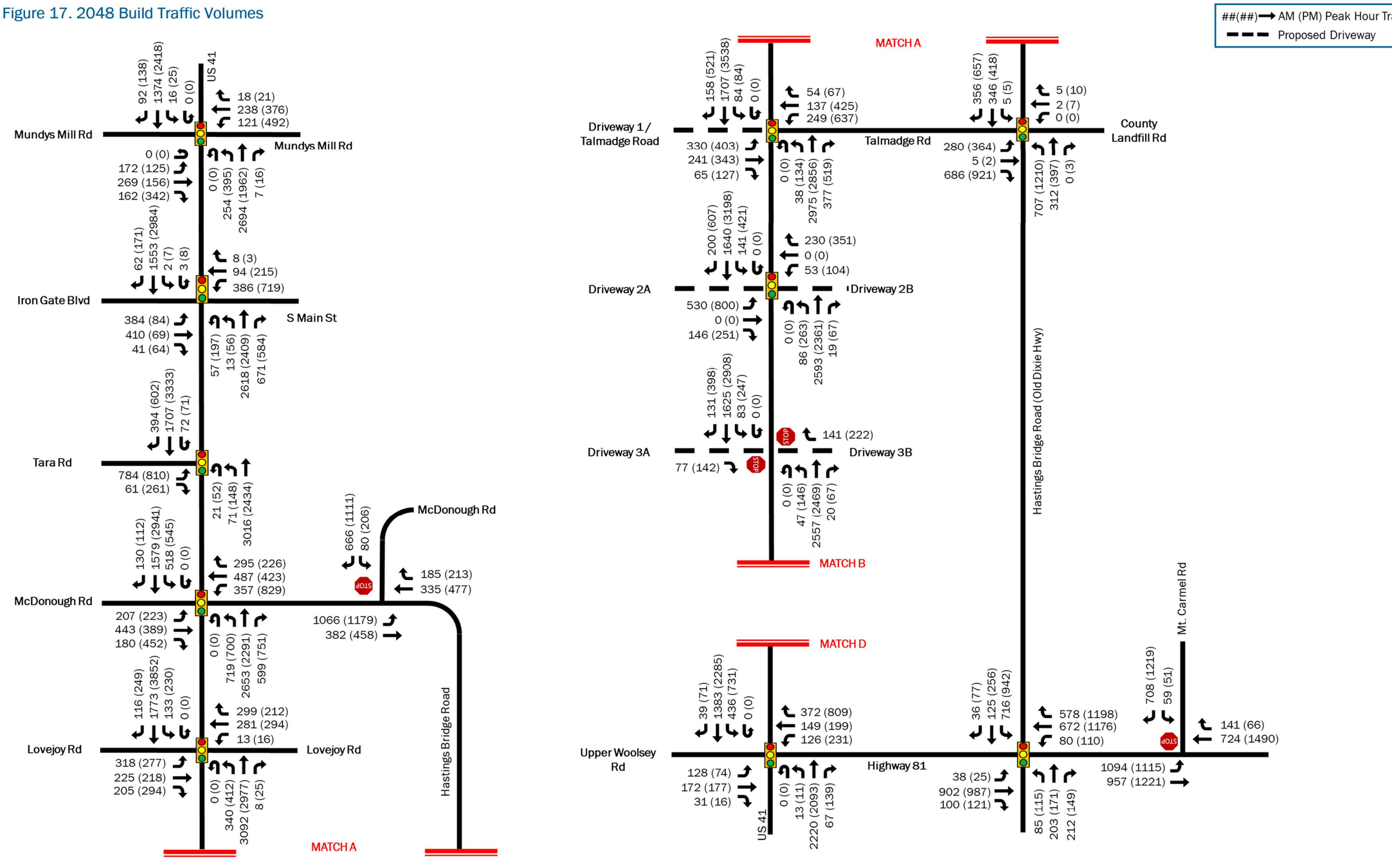
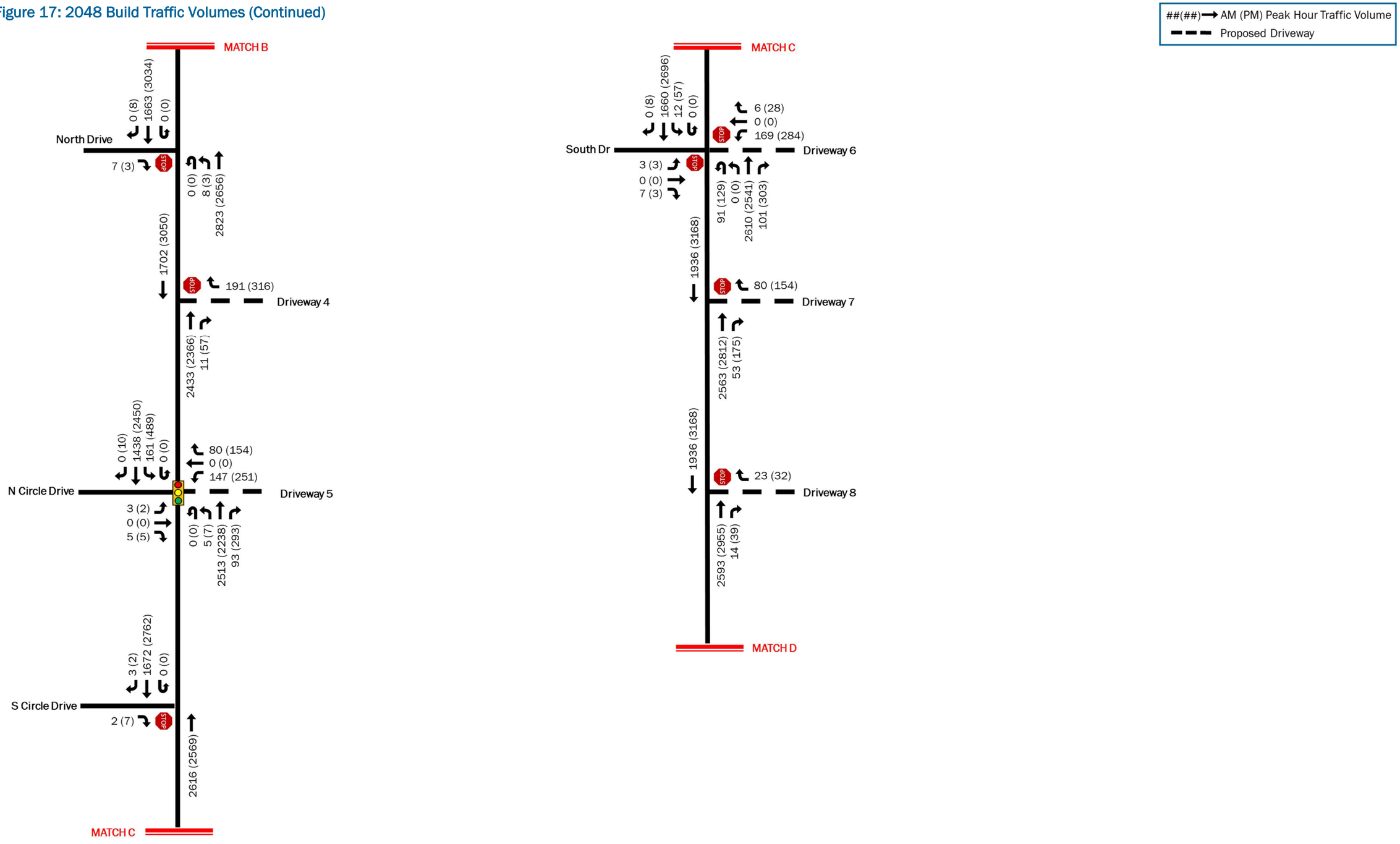


Figure 17: 2048 Build Traffic Volumes (Continued)



D. Traffic Impact Analysis

The analysis in each of the scenarios for the study was performed using the traffic analysis software Synchro® 11. Average vehicular delays are calculated and reported as Levels of Service (LOS) as defined by the Highway Capacity Manual, 6th Edition (HCM 6).

Performance Criteria pertaining to the HCM methodology is shown in Table 3. The study considers an LOS D as a benchmark for acceptable intersection operation. Synchro® output reports for the study intersections are included in Appendix D.

Table 3: HCM Level-of-Service Performance Criteria

Levels of Service	Average Delay (seconds/vehicle)	
	Signalized Intersections	Unsignalized Intersections
A	≤ 10.0	≤ 10.0
B	> 10.1 – 20.0	> 10.1 – 15.0
C	> 20.1 – 35.0	> 15.1 – 25.0
D	> 35.1 – 55.0	> 25.1 – 35.0
E	> 55.1 – 80.0	> 35.1 – 50.0
F	> 80.0	> 50.0

D.1. Existing Capacity Analysis

The capacity analysis results of the Existing Conditions are shown in Table 4, representing volumes presented in Figure 5.

Table 4: Capacity Analysis Results –Existing Conditions

ID	Intersection	Control	Movement	AM		PM	
				LOS	Delay	LOS	Delay
1	US 41 & Mundys Mill Rd	Signal	**Overall**	**C**	**25.1**	**D**	**40.4**
			EB	F	86.9	E	69.3
			WB	F	152.8	F	153.6
			NB	A	0.9	A	2.5
			SB	B	11.0	B	19.9
2	US 41 & Iron Gate Blvd / S Main St	Signal	**Overall**	**E**	**63.6**	**B**	**17.8**
			EB	F	>300.0	F	98.3
			WB	F	100.1	F	99.6
			NB	A	7.1	A	0.6
			SB	A	0.5	A	0.7
3	US 41 & Tara Rd	Signal	**Overall**	**B**	**18.0**	**B**	**18.1**
			EB	E	79.1	E	77.4
			NB	B	10.6	B	13.6
			SB	A	0.3	A	0.8
4	US 41 & McDonough Rd	Signal	**Overall**	**D**	**39.4**	**D**	**45.9**
			EB	F	96.9	F	143.5
			WB	F	134.2	F	141.9
			NB	A	4.9	A	6.7
			SB	C	25.7	C	24.1
5	US 41 & Lovejoy Rd	Signal	**Overall**	C	26.8	C	30.6
			EB	E	63.2	F	133.1
			WB	D	48.4	D	53.4
			NB	C	24.4	B	20
			SB	A	2.6	A	2.5
6	US 41 & Talmadge Rd	Stop-Control	EB	F	>300.0	F	>300.0
			WB	F	298.2	F	>300.0
			NBL	A	9.4	B	13.1
			SBL	C	24.1	C	0.5
7	US 41 & North Dr	Stop-Control	EB	C	16.8	D	30.0
			NBL	A	9.3	B	12.1
8	US 41 & N Circle Dr	Stop-Control	EB	B	10.8	B	14.0
9			EB	C	22.2	C	20.7

ID	Intersection	Control	Movement	AM		PM	
				LOS	Delay	LOS	Delay
	US 41 & S Circle Dr	Stop-Control	NBL	A	9.3	B	12.1
10	US 41 & South Dr	Stop-Control	EB	B	11.0	B	14.1
11	US 41 & SR 81 / Upper Woolsey Rd	Signal	**Overall**	**B**	**14.6**	**B**	**16.4**
			EB	D	51.2	D	44.5
			WB	D	51.5	D	48.9
			NB	A	8.8	B	11.0
			SB	A	6.8	B	10.7
12	SR 81 & Old Dixie Hwy	Signal	**Overall**	**B**	**14.1**	**B**	**13.4**
			EB	B	13.4	B	12.2
			WB	B	13.1	B	13.2
			NB	B	19.0	B	18.9
			SB	B	11.9	B	11.3
13	Hastings Bridge Rd & Talmadge Rd / County Landfill Rd	Signal	**Overall**	**B**	**13.5**	**B**	**15.9**
			EB	C	21.4	C	21.7
			WB	B	16.4	B	16.1
			NB	B	13.3	B	17.5
			SB	A	8.6	B	11.4
14	McDonough Rd & Hastings Bridge Rd	Stop-Control	SB	B	12.1	B	14.0
			EBL	A	9.0	A	9.4
15	SR 81 & Mt Carmel Rd	Stop-Control	SB	F	266.6	F	136.7
			EBL	B	10.6	B	10.2

As shown in Table 4, all study intersections operate at acceptable overall Levels of Service (LOS) D or better during the AM and PM peak hours except for the following intersections and their associated movements:

US 41 at Mundy's Mill Road

The eastbound and westbound approaches operate at LOS F during the AM peak hour, the eastbound approach operates at LOS E during the PM peak hour, and the westbound approach operates at LOS F during the PM peak hour. This is largely due to the signal timings favoring the northbound and southbound approaches, as well as a high cycle length of 180 seconds for signals along US 41.

US 41 at Iron Gate Boulevard / S Main Street

Similar to the intersection with Mundy's Mill Road, the eastbound and westbound approaches operate at LOS F during the AM and PM peak hours. This is largely due to the signal timings favoring the northbound and southbound approaches, as well as a high cycle length of 180 seconds for signals along US 41. Overall operations during the AM peak hour also operate at unsatisfactory LOS E.

US 41 at Tara Road

The eastbound approach operates at LOS E during both the AM and PM peak hours. Like the previous intersections, this is largely due to the signal timings favoring the northbound and southbound approaches, as well as a high cycle length of 180 seconds for signals along US 41.

US 41 at McDonough Road

The eastbound and westbound approaches operate at LOS F during the AM and PM peak hours. This is largely due to the signal timings favoring the northbound and southbound approaches, as well as a high cycle length of 180 seconds for signals along US 41.

US 41 at Lovejoy Road

The eastbound approach operates at LOS E during the AM peak hour and LOS F during the PM peak hours. This is largely due to the signal timings favoring the northbound and southbound approaches, as well as a high cycle length of 180 seconds for signals along US 41.

US 41 at Talmadge Road

The eastbound and westbound approaches operate at LOS F during both the AM and PM peak hours. This is due to the traffic intersecting a very high-volume divided highway at a stop-controlled movement and the lack of separate turn lanes for these approaches.

SR 81 at Mt Carmel Road

The southbound approach operates at LOS F during both the AM and PM peak hours. This is due to the large amount of traffic from Mt. Carmel Road intersecting with an equally high-volume highway at a stop-controlled movement. There are also no separate lanes for southbound right turns and left turns, though there are far more southbound right-turns.

D.2. 2028 No-Build Capacity Analysis

The results of the 2028 No-Build Condition's capacity analysis are shown in Table 5 and include analysis of the volumes presented in Figure 6.

Table 5: Capacity Analysis Results –2028 No-Build Conditions

ID	Intersection	Control	Movement	AM		PM	
				LOS	Delay	LOS	Delay
1	US 41 & Mundys Mill Rd	Signal	**Overall**	**B**	**19.0**	**C**	**29.5**
			EB	E	76.5	F	84.4
			WB	F	82.4	E	69.1
			NB	A	0.9	A	2.8
			SB	B	12.8	C	25.3
2	US 41 & Iron Gate Blvd / S Main St	Signal	**Overall**	**C**	**22.3**	**B**	**15.7**
			EB	F	87.1	F	98.4
			WB	F	88.3	F	85.8
			NB	A	0.5	A	0.4
			SB	A	0.3	A	0.3
3	US 41 & Tara Rd	Signal	**Overall**	**B**	**16.7**	**B**	**17.2**
			EB	E	77.6	F	81.6
			NB	A	8.4	A	7.5
			SB	A	0.5	A	1.3
4	US 41 & McDonough Rd	Signal	**Overall**	**E**	**75.2**	**D**	**43.2**
			EB	F	97.4	F	105.0
			WB	F	95.1	F	97.8
			NB	E	78.6	B	12.7
			SB	D	52.5	D	36.0
5	US 41 & Lovejoy Rd	Signal	**Overall**	**C**	**29.7**	**D**	**43.3**
			EB	E	60.3	F	223.8
			WB	D	44.2	D	54.0
			NB	C	30.3	C	20.9
			SB	A	6.3	A	2.4
6	US 41 & Talmadge Rd	Stop-Control	EB	F	>300.0	F	>300.0
			WB	F	>300.0	F	>300.0
			NBL	A	9.7	B	14.4
			SBL	D	29.6	C	19.6
7	US 41 & North Dr	Stop-Control	EB	C	18.9	E	36.9
			NBL	A	9.6	B	13.1
8	US 41 & N Circle Dr	Stop-Control	EB	B	11.1	C	15.0
9			EB	D	25.8	C	24.2

ID	Intersection	Control	Movement	AM		PM	
				LOS	Delay	LOS	Delay
	US 41 & S Circle Dr	Stop-Control	NBL	A	9.7	B	13.1
10	US 41 & South Dr	Stop-Control	EB	B	11.4	C	15.1
11	US 41 & SR 81 / Upper Woolsey Rd	Signal	**Overall**	**B**	**15.3**	**B**	**17.8**
			EB	D	50.3	D	43.0
			WB	D	50.6	D	47.8
			NB	B	10.0	B	12.8
			SB	A	7.7	B	12.7
12	SR 81 & Old Dixie Hwy	Signal	**Overall**	**B**	**15.1**	**B**	**14.3**
			EB	B	14.1	B	12.7
			WB	B	13.7	B	13.9
			NB	C	20.8	C	20.6
			SB	B	12.9	B	12.2
13	Hastings Bridge Rd & Talmadge Rd / County Landfill Rd	Signal	**Overall**	**B**	**16.0**	**C**	**21.6**
			EB	C	21.7	C	22.7
			WB	B	16.0	B	15.8
			NB	B	18.0	C	29.2
			SB	A	10.0	B	13.9
14	McDonough Rd & Hastings Bridge Rd	Stop-Control	SB	B	13.0	C	15.7
			EBL	A	9.4	A	9.9
15	SR 81 & Mt Carmel Rd	Stop-Control	SB	F	>300.0	F	>300.0
			EBL	B	11.6	B	11.0

As shown in Table 5, with the applied background growth rate, operations at the study intersections are expected to worsen slightly due to the growth in the study area. The following intersections are expected to operate with undesirable Levels of Service (LOS):

US 41 at Mundy's Mill Road

Traffic operations are expected to improve over existing conditions with the completion of the road widening project along US 41; however, the eastbound and westbound approaches are expected to continue to operate with undesirable LOS due to the signal timings favoring the northbound and southbound approaches. Overall traffic operations are expected to be satisfactory during both the AM and PM peak hours.

US 41 at Iron Gate Boulevard / S Main Street

Traffic operations are expected to improve over existing conditions with the completion of the road widening project along US 41; however, the eastbound and westbound approaches are expected to continue to operate with undesirable LOS due to the signal timings favoring the northbound and

southbound approaches. Overall traffic operations are expected to be satisfactory during both the AM and PM peak hours.

US 41 at Tara Road

Traffic operations are expected to improve over existing conditions with the completion of the road widening project along US 41; however, the eastbound approach is expected to continue to operate with undesirable LOS due to the signal timings favoring the northbound and southbound approaches. The eastbound approach is expected to change from LOS E to F during the PM peak hour. Overall traffic operations are expected to be satisfactory during both the AM and PM peak hours.

US 41 at McDonough Road

The eastbound and westbound approaches continue to operate at LOS F during the AM and PM peak hours. The northbound and overall traffic operations are expected to change to LOS E during the AM peak hour due to the increased traffic volumes. Overall traffic operations are expected to be satisfactory during the PM peak hour.

US 41 at Lovejoy Road

The eastbound approach continues to operate at LOS E during the AM peak hour and LOS F during the PM peak hours. Overall traffic operations are expected to be satisfactory during both the AM and PM peak hours.

US 41 at Talmadge Road

The eastbound and westbound approaches continue to operate at LOS F during both the AM and PM peak hours.

US 41 at North Drive

The eastbound approach is expected to operate at LOS E during PM peak hour with the increased volumes along US 41.

SR 81 at Mt Carmel Road

The southbound approach continues to operate at LOS F during both the AM and PM peak hours.

D.3. 2028 No-Build Capacity Analysis

The results of the 2048 No-Build Condition's capacity analysis are shown in Table 6 and include analysis of the volumes presented in Figure 7.

Table 6: Capacity Analysis Results –2048 No-Build Conditions

ID	Intersection	Control	Movement	AM		PM	
				LOS	Delay	LOS	Delay
1	US 41 & Mundys Mill Rd	Signal	**Overall**	**C**	**28.7**	**E**	**60.2**
			EB	E	75.3	F	121.8
			WB	F	89.8	F	84.0
			NB	B	13.4	C	31.5
			SB	C	22.3	E	63.2
2	US 41 & Iron Gate Blvd / S Main St	Signal	**Overall**	**D**	**43.3**	**B**	**18.7**
			EB	F	96.0	F	98.2
			WB	F	105.7	F	92.5
			NB	D	39.2	A	6.4
			SB	A	0.7	A	0.3
3	US 41 & Tara Rd	Signal	**Overall**	**C**	**22.7**	**E**	**61.1**
			EB	E	78.6	F	139.3
			NB	B	19.8	C	21.3
			SB	A	1.1	E	58.9
4	US 41 & McDonough Rd	Signal	**Overall**	**F**	**204.9**	**F**	**190.2**
			EB	F	243.0	F	234.0
			WB	F	230.5	F	215.9
			NB	F	236.4	F	146.7
			SB	F	131.7	F	206.9
5	US 41 & Lovejoy Rd	Signal	**Overall**	F	106.9	F	279.6
			EB	F	279.2	F	>300.0
			WB	D	41.3	F	126.4
			NB	F	81.1	F	91.1
			SB	F	87.7	F	207.9
6	US 41 & Talmadge Rd / Driveway 1	Stop-Control	EB	F	>300.0	F	>300.0
			WB	F	>300.0	F	>300.0
			NBL	B	11.9	D	27.9
			SBL	F	206.2	F	54.7
7	US 41 & North Dr	Stop-Control	EB	E	38.5	F	148.1
			NBL	B	11.8	C	20.7
8	US 41 & N Circle Dr	Stop-Control	EB	B	13.3	C	22.5
9			EB	F	59.7	F	81.8

ID	Intersection	Control	Movement	AM		PM	
				LOS	Delay	LOS	Delay
	US 41 & S Circle Dr	Stop-Control	NBL	B	11.8	C	20.9
10	US 41 & South Dr	Stop-Control	EB	B	13.9	C	22.7
11	US 41 & SR 81 / Upper Woolsey Rd	Signal	**Overall**	**C**	**21.5**	**C**	**29.0**
			EB	D	45.8	D	40.4
			WB	D	46.5	E	57.4
			NB	B	18.7	C	21.2
			SB	B	14.5	C	27.9
12	SR 81 & Old Dixie Hwy	Signal	**Overall**	**C**	**22.5**	**C**	**20.5**
			EB	B	19.2	B	15.2
			WB	B	17.5	B	19.2
			NB	C	32.8	C	29.4
			SB	C	25.6	C	21.1
13	Hastings Bridge Rd & Talmadge Rd / County Landfill Rd	Signal	**Overall**	F	**153.7**	F	**285.8**
			EB	C	31.8	D	43.4
			WB	B	14.8	B	14.9
			NB	F	334.3	F	>300.0
			SB	C	22.1	E	70.3
14	McDonough Rd & Hastings Bridge Rd	Stop-Control	SB	F	>300.0	F	>300.0
			EBL	B	13.0	C	15.1
15	SR 81 & Mt Carmel Rd	Stop-Control	SB	F	150.9	F	>300.0
			EBL	D	34.3	C	22.9

As shown in Table 6, with the applied background growth rate, operations at the study intersections are expected to worsen slightly due to the growth in the study area. The following intersections are expected to operate with undesirable Levels of Service (LOS):

US 41 at Mundy's Mill Road

Overall traffic operations are expected to worsen to LOS E during the PM peak hour due to increased volumes, and the westbound approach changes to LOS F during the PM peak hour. Overall traffic operations are expected to be satisfactory during the AM peak hour.

US 41 at Iron Gate Boulevard / S Main Street

The eastbound and westbound approaches are expected to continue to operate with undesirable LOS due to the signal timings favoring the northbound and southbound approaches. Overall traffic operations are expected to be satisfactory during both the AM and PM peak hours.

US 41 at Tara Road

Overall traffic operations are expected to worsen to LOS E during the PM peak hour due to increased volumes. The eastbound approach is expected to continue to operate with undesirable LOS due to the

signal timings favoring the northbound and southbound approaches. Overall traffic operations are expected to be satisfactory during the AM peak hour.

US 41 at McDonough Road

With the increased volumes, the intersection is expected to be over-capacity, with the intersection operating at LOS F on all four approaches during both the AM and PM peak hours.

US 41 at Lovejoy Road

With the increased volumes, the intersection is expected to be over-capacity, with the intersection operating at LOS F on all four approaches during both the AM and PM peak hours except the westbound approach, which is expected to operate at LOS D during the AM peak hour.

US 41 at Talmadge Road

The southbound left-turns are expected to have a high level of delay due to increased volumes along US 41. The southbound left-turn movement is expected to operate at LOS F during both the AM and PM peak hours.

US 41 at North Drive

The eastbound approach is expected to operate at LOS E during AM peak hour and LOS F during the PM peak hour with the increased volumes along US 41.

US 41 at South Circle Drive

The eastbound approach is expected to operate at LOS F during both the AM and PM peak hours with the increased volumes along US 41.

US 41 at SR 81/Upper Woolsey Road

The westbound approach changes to LOS E during the PM peak hour. Overall traffic operations are expected to be satisfactory during both the AM and PM peak hours.

Hastings Bridge Road at Talmadge Road / County Landfill Road

With increased volumes along the roadways, the overall traffic operations and northbound approach is expected to operate at LOS F during both the AM and PM peak hours. Also, the southbound approach is expected to operate at LOS E during the PM peak hour.

McDonough Road at Hastings Bridge Road

The southbound approach is expected to operate at LOS F during both the AM and PM peak hours due to the increased traffic volumes.

SR 81 at Mt Carmel Road

The southbound approach continues to operate at LOS F during both the AM and PM peak hours.

D.4. 2028 Build Capacity Analysis

The results of the 2028 Build Condition's capacity analysis are shown in Table 7 and includes analysis of the volumes presented in Figure 19.

Table 7: Capacity Analysis Results – 2028 Build Conditions

ID	Intersection	Control	Movement	AM		PM	
				LOS	Delay	LOS	Delay
1	US 41 & Mundys Mill Rd	Signal	**Overall**	**B**	**19.1**	**C**	**33.6**
			EB	E	76.7	F	112.7
			WB	F	82.4	E	65.4
			NB	A	1.1	A	4.4
			SB	B	13.4	C	30.4
2	US 41 & Iron Gate Blvd / S Main St	Signal	**Overall**	**C**	**22.2**	**B**	**17.2**
			EB	F	88.6	F	98.5
			WB	F	89.5	F	85.7
			NB	A	0.6	A	0.5
			SB	A	0.3	A	4.1
3	US 41 & Tara Rd	Signal	**Overall**	**B**	**16.4**	**B**	**17.1**
			EB	E	78.3	F	86.0
			NB	A	8.7	A	7.7
			SB	A	0.5	A	1.8
4	US 41 & McDonough Rd	Signal	**Overall**	**F**	**85.3**	**F**	**96.1**
			EB	F	135.3	F	141.3
			WB	F	127.8	F	123.8
			NB	E	78.6	E	65.6
			SB	E	56.6	F	102.8
5	US 41 & Lovejoy Rd	Signal	**Overall**	**B**	**16.1**	**F**	**104.7**
			EB	E	62.4	F	>300
			WB	D	44.8	E	71.8
			NB	A	3.5	C	23.5
			SB	A	6.1	D	35.4
6	US 41 & Talmadge Rd / Driveway 1	Signal	**Overall**	**B**	**10.2**	**B**	**13.3**
			EB	F	80.5	F	82.8
			WB	E	77.4	E	68.2
			NB	A	0.5	A	1.0
			SB	A	0.5	A	0.4
7	US 41 & North Dr	Stop-Control	EB	B	11.9	C	17.5
			NBL	B	10.1	C	15.2
8		Signal	**Overall**	**A**	**6.2**	**A**	**8.3**
			EB	F	87.2	F	85.9

ID	Intersection	Control	Movement	AM		PM	
				LOS	Delay	LOS	Delay
	US 41 & N Circle Dr / Driveway 5		WB	F	82.2	E	77.9
			NB	A	6.3	A	8.6
			SB	A	0.5	A	1.4
9	US 41 & S Circle Dr	Stop-Control	EB	B	11.9	C	16.9
10	US 41 & South Dr / Driveway 6	Stop-Control	EB	D	28.1	F	148.9
			WB	F	>300	F	>300
			NBL	C	16.4	F	50.6
			SBL	D	27.8	D	26.0
11	US 41 & SR 81 / Upper Woolsey Rd	Signal	**Overall**	**B**	**15.4**	**B**	**19.6**
			EB	D	50.4	D	43.1
			WB	D	50.6	D	47.6
			NB	B	10.7	B	16.6
			SB	A	8.2	B	14.9
12	SR 81 & Old Dixie Hwy	Signal	**Overall**	**B**	**18.5**	**C**	**22.1**
			EB	B	17.3	B	16.8
			WB	B	16.4	C	21.9
			NB	C	26.8	C	29.4
			SB	B	16.7	C	23.9
13	Hastings Bridge Rd & Talmadge Rd / County Landfill Rd	Signal	**Overall**	**D**	**39.1**	**F**	**178.3**
			EB	C	31.1	F	92.9
			WB	B	14.7	B	14.8
			NB	E	64.7	F	>300
			SB	B	13.6	C	20.4
14	McDonough Rd & Hastings Bridge Rd	Stop-Control	SB	C	22.2	C	22.2
			EBL	A	9.9	A	9.9
15	SR 81 & Mt Carmel Rd	Stop-Control	SB	F	>300	F	>300
			EBL	B	14.4	B	14.4
16	US 41 & Driveway 2A / Driveway 2B	Signal	**Overall**	**A**	**7.8**	**A**	**7.8**
			EB	F	88.2	F	88.2
			WB	F	93.6	F	93.6
			NB	A	0.5	A	0.5
			SB	A	0.4	A	0.4
17	US 41 & Driveway 3A / Driveway 3B	R-Cut Stop-Control	EB	B	13.7	B	13.7
			WB	C	21.1	C	21.1
			NBL	B	14.8	B	14.8
			SBL	D	29.0	D	29.0
18	US 41 & Driveway 4	Stop-Control	WB	C	21.7	C	21.7

ID	Intersection	Control	Movement	AM		PM	
				LOS	Delay	LOS	Delay
19	US 41 & Driveway 7	Stop-Control	WB	C	20.4	C	20.4
20	US 41 & Driveway 8	Stop-Control	WB	C	19.4	C	19.4

As shown in Table 7, with the addition of project traffic, the study intersections are expected to see an increase in delay due to the addition of project traffic. The following intersections or approaches are expected to operate with undesirable Levels of Service (LOS):

US 41 at Mundy's Mill Road

Overall traffic operations are expected to continue to operate similar to the 2028 No-Build Conditions.

US 41 at Iron Gate Boulevard / S Main Street

Overall traffic operations are expected to continue to operate similar to the 2028 No-Build Conditions.

US 41 at Tara Road

Overall traffic operations are expected to continue to operate similar to the 2028 No-Build Conditions.

US 41 at McDonough Road

With the increased volumes, the intersection is expected to be over-capacity, with the intersection operating at LOS F for all approaches during both the AM and PM peak hours except for the northbound and southbound approaches operating at LOS E during the AM peak hour, and the northbound approach at LOS E during the PM peak hour.

US 41 at Lovejoy Road

With the increased volumes, the intersection is expected to be over-capacity, with the intersection operating at LOS F during the PM peak hour and the westbound approach changing to LOS E during the PM peak hour.

US 41 at Talmadge Road / Site Driveway 1

Overall traffic operations are expected to improve with the installation of a traffic signal, however, the westbound approach is expected to operate LOS E during both the AM and PM peak hours, and the eastbound approach at LOS F during the PM peak hour.

US 41 at North Circle Drive / Site Driveway 5

Overall traffic operations are expected to improve with the installation of a traffic signal, however, the westbound approach is expected to operate LOS F and E during the AM and PM peak hours, respectively, and the eastbound approach at LOS F during both the AM and PM peak hours.

US 41 at South Drive / Site Driveway 6

The eastbound, westbound approaches and northbound left-turn is expected to operate LOS F during the PM peak hour.

Hastings Bridge Road at Talmadge Road / County Landfill Road

The intersection is expected to be over capacity during the PM peak hour with the overall traffic operations, eastbound approach, and northbound approach expected to operate at LOS F. During the AM peak hour, the northbound approach is expected to operate at LOS E during the AM peak hour.

SR 81 at Mt Carmel Road

The southbound approach continues to operate at LOS F during the PM peak hour.

US 41 & Driveway 2A / Driveway 2B

The eastbound and westbound approaches are expected to operate at LOS F during both the AM and PM peak hours.

D.5. 2048 Build Capacity Analysis

The results of the 2048 Build Condition's capacity analysis are shown in Table 8 and includes analysis of the volumes presented in Figure 20.

Table 8: Capacity Analysis Results – 2048 Build Conditions

ID	Intersection	Control	Movement	AM		PM	
				LOS	Delay	LOS	Delay
1	US 41 & Mundys Mill Rd	Signal	**Overall**	**D**	**39.4**	**F**	**135.0**
			EB	E	72.5	F	>300
			WB	F	96.6	F	166.7
			NB	C	31.1	D	52.5
			SB	C	27.0	F	118.2
2	US 41 & Iron Gate Blvd / S Main St	Signal	**Overall**	**D**	**50.9**	**C**	**31.6**
			EB	F	116.2	F	98.2
			WB	F	122.7	F	139.8
			NB	D	47.8	C	24.0
			SB	A	0.9	A	1.0
3	US 41 & Tara Rd	Signal	**Overall**	**C**	**25.4**	**F**	**128.5**
			EB	F	87.8	F	190.8
			NB	C	24.6	C	21.1
			SB	A	1.6	F	182.0
4	US 41 & McDonough Rd	Signal	**Overall**	**F**	**286.8**	**F**	**>300**
			EB	F	273.9	F	>300
			WB	F	244.4	F	>300
			NB	F	>300	F	>300
			SB	F	206.4	F	>300
5	US 41 & Lovejoy Rd	Signal	**Overall**	F	217.1	F	>300
			EB	F	>300	F	>300
			WB	D	48.9	F	169.8
			NB	F	215.9	F	139.8
			SB	F	169.0	F	>300
6	US 41 & Talmadge Rd / Driveway 1	Signal	**Overall**	D	49.3	F	250.8
			EB	F	175.1	F	>300
			WB	F	157.5	F	290.8
			NB	D	35.7	F	133.9
			SB	A	1.1	F	>300
7	US 41 & North Dr	Stop-Control	EB	C	17.7	E	41.4
			NBL	C	15.3	E	40.7
8		Signal	**Overall**	B	18.6	D	45.9
			EB	F	86.1	F	86.1

ID	Intersection	Control	Movement	AM		PM	
				LOS	Delay	LOS	Delay
	US 41 & N Circle Dr / Driveway 5		WB	F	123.1	F	195.9
			NB	B	15.5	D	43.3
			SB	A	8.1	C	26.9
9	US 41 & S Circle Dr	Stop-Control	EB	C	17.4	E	35.8
10	US 41 & South Dr / Driveway 6	Stop-Control	EB	F	>300	F	>300
			WB	F	>300	F	>300
			NBL	F	144.3	F	>300
			SBL	F	114.9	F	>300
11	US 41 & SR 81 / Upper Woolsey Rd	Signal	**Overall**	**D**	**46.1**	**F**	**115.8**
			EB	E	57.4	D	42.4
			WB	E	56.6	D	54.3
			NB	D	52.7	F	136.5
			SB	C	34.7	F	115.2
12	SR 81 & Old Dixie Hwy	Signal	**Overall**	**F**	**134.7**	**F**	**287.2**
			EB	F	134.5	F	135.9
			WB	D	49.9	F	32.8
			NB	C	34.2	C	31.2
			SB	F	>300	F	>300
13	Hastings Bridge Rd & Talmadge Rd / County Landfill Rd	Signal	**Overall**	**F**	**>300**	**F**	**>300**
			EB	F	>300	F	>300
			WB	B	13.4	B	12.2
			NB	F	>300	F	>300
			SB	D	46.3	F	270.3
14	McDonough Rd & Hastings Bridge Rd	Stop-Control	SB	F	159.1	F	>300
			EBL	D	31.0	F	96.2
15	SR 81 & Mt Carmel Rd	Stop-Control	SB	F	>300	F	>300
			EBL	F	>300	F	>300
16	US 41 & Driveway 2A / Driveway 2B	Signal	**Overall**	D	42.6	F	203.1
			EB	F	109.2	F	224.1
			WB	F	309.1	F	>300
			NB	B	17.7	F	108.7
			SB	B	12.4	F	223.7
17	US 41 & Driveway 3A / Driveway 3B	R-Cut Stop-Control	EB	D	25.0	F	>300
			WB	C	21.6	F	>300
			NBL	E	39.9	F	>300
			SBL	D	31.0	F	>300
18	US 41 & Driveway 4	Stop-Control	WB	C	24.0	F	>300

ID	Intersection	Control	Movement	AM		PM	
				LOS	Delay	LOS	Delay
19	US 41 & Driveway 7	Stop-Control	WB	C	21.9	F	>300
20	US 41 & Driveway 8	Stop-Control	WB	C	19.2	F	80.9

As shown in Table 8, with the addition of the completed project traffic, the study intersections are expected to see a large increase in delay. The following intersections or approaches are expected to operate with undesirable Levels of Service (LOS):

US 41 at Mundy's Mill Road

Overall traffic operations are expected to continue to operate similarly to the 2048 No-Build conditions.

US 41 at Iron Gate Boulevard / S Main Street

Overall traffic operations are expected to continue to operate similarly to the 2048 No-Build conditions.

US 41 at Tara Road

Overall traffic operations are expected to continue to operate similarly to the 2048 No-Build conditions.

US 41 at McDonough Road

With the increased volumes, the intersection is expected to be over-capacity, with the intersection operating at LOS F for all approaches during both the AM and PM peak hours.

US 41 at Lovejoy Road

With the increased volumes, the intersection is expected to be over-capacity, with the intersection operating at LOS F during the AM and PM peak hours, except for the westbound approach during the AM peak hour which operating at LOS D.

US 41 at Talmadge Road / Site Driveway 1

Overall traffic operations are expected to continue to operate similar to the 2048 No-Build conditions.

US 41 at North Drive

The eastbound approach and the northbound left-turn is expected to operate at LOS E during PM peak hour.

US 41 at North Circle Drive / Site Driveway 5

Overall traffic operations are expected to improve with the installation of a traffic signal, however, the westbound approach is expected to operate LOS F during both the AM and PM peak hours.

US 41 at South Circle Drive

The eastbound approach is expected to operate at LOS E during the PM peak hour.

US 41 at South Drive / Site Driveway 6

The eastbound and westbound approaches and northbound and southbound left-turn are expected to operate LOS F during both the AM and PM peak hours.

US 41 & SR 81 / Upper Woolsey Road

The eastbound and southbound approaches are expected to operate at LOS F during the AM peak hour, and the eastbound, westbound and southbound approaches are expected to operate at LOS F during PM peak hour.

SR 81 at Old Dixie Highway

The eastbound and westbound approaches are expected to operate at LOS E during the AM peak hour, and the northbound and southbound approaches are expected to operate at LOS F during PM peak hour.

Hastings Bridge Road at Talmadge Road / County Landfill Road

The intersection is expected to be over capacity during the PM peak hour with the overall traffic operations, eastbound approach, northbound and southbound approaches expected to operate at LOS F during the PM peak hour, and the eastbound and northbound approaches expected to operate at LOS F during AM peak hour.

McDonough Road at Hastings Bridge Road

The southbound approach is expected to operate at LOS F during both the AM and PM peak hours, and the eastbound left-turn during the PM peak hour.

McDonough Road at Hastings Bridge Road

The southbound approach continues to operate at LOS F during both the AM and PM peak hours and the eastbound left-turn changes to LOS F during the PM peak hour.

SR 81 at Mt Carmel Road

The southbound approach continues to operate at LOS F during both the AM and PM peak hours and the eastbound left-turn changes to LOS F during both the AM and PM peak hours.

US 41 & Driveway 2A / Driveway 2B

The eastbound and westbound approaches are expected to operate at LOS F during both the AM and PM peak hours and the northbound and southbound approaches expected to operate at LOS F during the PM peak hour.

US 41 & Driveway 3A / Driveway 3B

All four approaches are expected to operate at LOS F during the PM peak hour, and the northbound approach is expected to operate at LOS E during the AM peak hour.

US 41 & Driveway 4

The westbound approach is expected to operate at LOS F during the PM peak hour.

US 41 & Driveway 7

The westbound approach is expected to operate at LOS F during the PM peak hour.

US 41 & Driveway 8

The westbound approach is expected to operate at LOS F during the PM peak hour.

D.6. Queue Length Analysis

Queue length analysis was conducted for all intersection approaches with failing Levels of Service (LOS) E or F where the project is adding additional trips to that approach. Queue length analysis results are modeled according to Highway Capacity Manual procedures, using the traffic analysis software Synchro® 11. Queue lengths reported include 50th percentile (average) queues, 95th percentile queues, existing storage lengths, and existing taper lengths to intersection approaches.

Queueing analysis indicates that many of the approaches are already overloaded and that the existing roadway facilities in the study will become worse under future traffic conditions. In No-Build Conditions, the traffic expected to be generated by the background growth in the area contributes to the delays and queues at each intersection. In Build Conditions, the additional site traffic generated by the proposed development minimally contributes to the delays and queues at each intersection.

In No-Build and Build Conditions, the following intersection approaches exceed the associated storage length capacities or have significant queue lengths in shared lane approaches during the AM and/or PM peak hours when compared with their 95th percentile queue lengths:

US 41 & Mundy's Mill Road

- Eastbound left-turn lane, AM peak hour (2048 No-Build Conditions) & both peak hours (2048 Build Conditions)
- Eastbound right-turn lane, PM peak hour (2048 Build Conditions)
- Westbound left-turn lane, PM peak hour (Existing and 2048 No-Build Conditions) & both peak hours (2048 Build Conditions)
- Westbound through/right lane, AM peak hour (Existing and 2048 No-Build Conditions) & both peak hours (2048 Build Conditions)
- Northbound left-turn lane, PM peak hour (2048 No-Build and 2048 Build Conditions)

US 41 & Iron Gate Boulevard / S Main Street

- Eastbound left-turn lane, AM peak hour (Existing, 2048 No-Build and 2048 Build Conditions)
- Westbound left-turn lane, both peak hours (Existing, 2048 No-Build and 2048 Build Conditions)
- Northbound left-turn lane, PM peak hour (2048 No-Build and 2048 Build Conditions)

US 41 & Tara Road

- Eastbound left-turn lane, PM peak hour (2028 Build and 2048 No-Build Conditions) & both peak hours (2048 Build Conditions)
- Eastbound right-turn lane, PM peak hour (2048 Build Conditions)
- Northbound left-turn lane, PM peak hour (2048 No-Build and 2048 Build Conditions)

US 41 & McDonough Road

- Eastbound left-turn lane, both peak hours (2028 No-Build, 2028 Build, 2048 No-Build, and 2048 Build Conditions)
- Eastbound right-turn lane, PM peak hour (2048 Build Conditions)
- Westbound left-turn lane, both peak hours (2028 No-Build, 2028 Build, 2048 No-Build, and 2048 Build Conditions)
- Northbound left-turn lane, PM peak hour (Existing, 2028 No-Build, and 2028 Build Conditions) & both peak hours (2048 No-Build and 2048 Build Conditions)
- Southbound left-turn lane, AM peak hour (Existing Conditions) & both peak hours (2028 No-Build, 2028 Build, 2048 No-Build, and 2048 Build Conditions)

US 41 & Lovejoy Road

- Eastbound left-turn lane, PM peak hour (Existing and 2028 No-Build Conditions) & both peak hours (2028 Build, 2048 No-Build, and 2048 Build Conditions)
- Eastbound through/right lane, PM peak hour (2028 Build, 2048 No-Build, and 2048 Build Conditions)
- Westbound through/left lane, PM peak hour (2028 Build, 2048 No-Build, and 2048 Build Conditions)
- Northbound left-turn lane, PM peak hour (Existing, 2028 No-Build, and 2028 Build Conditions) and both peak hours (2048 No-Build and 2048 Build Conditions)
- Southbound left-turn lane, AM peak hour (2048 No-Build Conditions), PM peak hour (2028 No-Build Conditions) and both peak hours (2048 Build Conditions)

US 41 & Talmage Road / Driveway 1

- Eastbound left-turn lane, PM peak hour (2048 No-Build Conditions) & both peak hours (2048 2048 Build Conditions)
- Eastbound through/right lane, both peak hours (2048 Build Conditions)
- Westbound left-turn lane, both peak hours (2048 Build Conditions)
- Westbound through/right lane, both peak hours (2048 Build Conditions)

US 41 & SR 81 / Upper Woolsey Road

- Eastbound left-turn lane, AM peak hour (2048 Build Conditions)
- Westbound left-turn lane, both peak hours (2048 No-Build and 2048 Build Conditions)
- Southbound left-turn lane, both peak hours (2048 Build Conditions)

SR 81 & Old Dixie Highway

- Westbound left-turn lane, AM peak hour (2048 No-Build Conditions) & both peak hours (2048 Build Conditions)
- Westbound right lane, PM peak hour (2048 Build Conditions)
- Southbound left-turn lane, PM peak hour (2028 Build Conditions), AM peak hour (2048 No-Build Conditions) & both peak hours (2048 Build Conditions)

Hastings Bridge Road & Talmadge Road / County Landfill Road

- Eastbound left/through/right lane, both peak hours (2028 Build, 2048 No-Build, and 2048 Build Conditions)
- Northbound left-turn lane, both peak hours (Existing, 2028 No-Build, 2028 Build, 2048 No-Build, and 2048 Build Conditions)
- Southbound through/right lane, both peak hours (2048 No-Build and 2048 Build Conditions)

McDonough Road & Hastings Bridge Road

- Westbound through/right lane, AM peak hour (2048 Build Conditions)
- Southbound left/right lane, both peak hours (2028 Build, 2048 No-Build, and 2048 Build Conditions)

SR 81 & Mt. Carmel Road

- Eastbound through/left lane, both peak hours (2028 No-Build, 2028 Build, 2048 No-Build, and 2048 Build Conditions)
- Southbound left/right lane, both peak hours (Existing, 2028 No-Build, 2028 Build, 2048 No-Build, and 2048 Build Conditions)

Table 9 shows intersection queue results comparing Existing, No-Build, and Build Conditions where study intersections have failing LOS, and/or queues exceeding storage lengths under future traffic conditions. An inventory of queue length output reports is included in Appendix E.

Table 9: Queue Analysis Comparisons

ID	Intersection	Turn Lane / Movement Approach	Lengths, in feet		50th (95th) Percentile Queues, in feet									
					Existing		2028 No-Build		2028 Build		2048 No-Build		2048 Build	
			Storage	Taper	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	US 41 & Mundy's Mill Rd	EB-L	135	50	112 (178)	74 (117)	117 (172)	74 (110)	117 (172)	74 (116)	164 (253)*	102 (158)	167 (282)*	113 (239)*
		EB-R	50	90	0 (0)	0 (53)	0 (21)	0 (0)	0 (12)	0 (68)	0 (24)	0 (58)	39 (115)	312 (529)*
		WB-L	120	50	77 (132)	371 (508)*	81 (128)	340 (408)	81 (128)	341 (431)	112 (172)	578 (820)*	114 (180)*	714 (957)*
		WB-TR	N/A	N/A	208 (376)*	284 (372)	204 (285)	288 (359)	204 (285)	287 (374)	303 (434)*	439 (577)	307 (473)*	480 (710)*
		NB-L	390	115	16 (23)	33 (110)	32 (57)	75 (176)	52 (77)	163 (284)	50 (70)	253 (445)*	218 (249)	540 (771)*
		NB-R	400	180	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		SB-L	390	115	3 (8)	5 (16)	4 (13)	7 (22)	4 (13)	7 (21)	7 (18)	13 (31)	7 (17)	11 (26)
		SB-R	320	140	0 (0)	0 (29)	0 (11)	0 (0)	0 (0)	0 (0)	0 (13)	0 (29)	0 (0)	0 (29)
2	US 41 & Iron Gate Blvd / S Main St	EB-L	120	110	450 (643)*	60 (110)	311 (401)	65 (118)	311 (402)	65 (119)	464 (664)*	98 (162)	478 (713)*	98 (162)
		EB-R	130	85	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		WB-L	100	135	124 (200)*	195 (289)*	134 (179)	211 (262)	146 (194)	244 (299)	204 (307)*	319 (428)*	261 (378)*	513 (646)*
		WB-R	100	70	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
		NB-L	330	100	10 (30)	66 (115)	12 (34)	104 (155)	7 (37)	103 (172)	41 (52)	235 (355)*	41 (44)	250 (426)*
		NB-R	135	75	35 (221)	81 (168)	29 (177)	111 (173)	9 (199)	143 (235)	347 (379)	193 (240)	374 (432)	326 (429)*
		SB-L	230	125	1 (4)	2 (5)	1 (4)	3 (5)	1 (4)	3 (5)	1 (4)	5 (7)	1 (2)	6 (5)
		SB-R	135	100	0 (0)	1 (18)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	9 (15)	0 (0)	9 (6)
3	US 41 & Tara Rd	EB-L	230	50	294 (347)	303 (355)	323 (375)	333 (397)	323 (375)	335 (409)*	475 (554)	598 (735)*	492 (626)*	647 (784)*
		EB-R	300	50	0 (36)	85 (159)	0 (37)	96 (178)	0 (37)	124 (213)	8 (49)	262 (379)	10 (54)	277 (436)*
		NB-L	400	100	4 (9)	60 (150)	1 (1)	110 (165)	6 (13)	135 (156)	13 (11)	274 (214)*	34 (15)	285 (148)*
		SB-R	120	50	34 (73)	73 (137)	25 (41)	48 (135)	27 (43)	50 (120)	54 (109)	144 (167)	60 (131)	161 (134)
4	US 41 & McDonough Rd	EB-L	315	65	119 (185)	135 (206)	143 (294)*	147 (281)*	145 (303)*	143 (212)*	316 (501)*	335 (528)*	312 (501)*	272 (467)*
		EB-R	270	75	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (75)	0 (0)	0 (0)	20 (103)	497 (736)*
		WB-L	330	235	87 (141)	147 (220)	97 (176)*	158 (272)*	176 (347)*	441 (659)*	201 (368)*	362 (560)*	594 (816)*	1634 (1901)*
		WB-R	125	115	102 (199)	16 (92)	121 (216)	30 (105)	80 (174)	66 (145)	248 (397)*	116 (219)	196 (317)	152 (253)
		NB-L	375	110	109 (263)	162 (310)*	194 (353)	267 (437)*	350 (492)	482 (675)*	749 (755)*	587 (754)*	1287 (910)*	1384 (1244)*
		NB-R	N/A	N/A	6 (29)	9 (43)	21 (55)	16 (51)	92 (141)	167 (219)	104 (110)	98 (186)	372 (268)	542 (481)
		SB-L	370	110	380 (612)*	146 (294)	403 (643)*	292 (498)*	431 (642)*	440 (596)*	836 (1083)*	857 (705)*	887 (1131)*	1043 (660)*
		SB-R	1000	110	10 (23)	3 (1)	12 (26)	1 (6)	9 (22)	0 (1)	18 (35)	6 (4)	11 (17)	6 (0)
5	US 41 & Lovejoy Rd	EB-L	160	50	246 (334)	202 (319)*	271 (362)	147 (281)*	269 (372)*	253 (432)*	464 (679)*	448 (651)*	531 (746)*	506 (709)*
		EB-TR	N/A	N/A	271 (339)	323 (422)	294 (359)	0 (0)	295 (366)	371 (556)*	424 (562)	578 (830)*	459 (609)	665 (910)*
		WB-TL	N/A	N/A	194 (248)	208 (285)	208 (258)	158 (272)	207 (262)	235 (342*)	276 (374)	381 (599)*	306 (418)	543 (754)*
		WB-R	80	50	60 (125)	51 (112)	71 (135)	30 (105)	77 (143)	52 (124)	167 (263)	123 (208)	219 (325)	122 (211)
		NB-L	420	110	90 (165)	131 (369)*	111 (198)	267 (437)*	181 (316)	345 (554)*	449 (672)*	644 (881)*	540 (473)*	734 (483)*
		NB-R	185	185	0 (0)	0 (0)	0 (0)	16 (51)	0 (0)	0 (1)	0 (0)	0 (2)	0 (0)	0 (0)
		SB-L	395	125	33 (89)	54 (74)	64 (149)	292 (498)*	75 (145)	86 (70)	167 (197)*	238 (169)	185 (128)*	363 (105)*
		SB-R	335	50	7 (25)	11 (22)	9 (68)	1 (6)	8 (51)	39 (32)	71 (85)	114 (76)	48 (31)	109 (26)

ID	Intersection	Turn Lane / Movement Approach	Lengths, in feet		50th (95th) Percentile Queues, in feet									
					Existing		2028 No-Build		2028 Build		2048 No-Build		2048 Build	
			Storage	Taper	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
6	US 41 & Talmadge Rd / Driveway 1	EB-L[1]	N/A	N/A	136 (61)	84 (170)	62 (119)	137 (288)	138 (201)	151 (208)	127 (297)	920* (516*)	435 (657)*	679 (911)*
		EB-R[1]	N/A	N/A					97 (159)	200 (284)			446 (661)*	793 (1035)*
		WB-L[1]	N/A	N/A	103 (40)	61 (133)	44 (98)	83 (184)	98 (151)	199 (264)	27 (209)	268 (112)	335 (540)*	1131 (1390)*
		WB-TR[1]	N/A	N/A					71 (131)	200 (275)			259 (442)*	697 (941)*
		NB-L	425	100	27 (3)	14 (42)	3 (14)	15 (43)	5 (11)	22 (74)	183 (810)	89 (26)	16 (16)	177 (113)
		NB-R	230	140	2 (0)	13 (39)	0 (2)	0 (2)	2 (12)	14 (33)	44 (242)	1 (0)	95 (94)	228 (166)
		SB-L	430	125	90 (18)	0 (0)	20 (51)	14 (38)	21 (55)	37 (38)	25 (74)	97 (22)	81 (59)	83 (34)
		SB-R	375	125	1 (0)	0 (8)	0 (0)	1 (18)	3 (6)	56 (54)	0 (0)	2 (3)	17 (11)	301 (95)
7	US 41 & North Dr	EB-LR	N/A	N/A	5 (23)	3 (7)	6 (26)	5 (23)	4 (21)	2 (15)	6 (26)	7 (27)	8 (29)	4 (20)
		NB-L	250	100	2 (13)	1 (7)	1 (11)	1 (10)	2 (15)	3 (61)	0 (6)	2 (13)	11 (93)	2 (15)
8	US 41 & N Circle Dr / Driveway 5	EB-L	N/A	N/A	N/A	N/A	N/A	N/A	2 (13)	0 (6)	N/A	N/A	2 (13)	2 (12)
		EB-TR	N/A	N/A	N/A	N/A	N/A	N/A	4 (21)	4 (20)	N/A	N/A	7 (27)	6 (25)
		WB-L	75	50	N/A	N/A	N/A	N/A	43 (92)	100 (189)	N/A	N/A	464 (642)	516 (590)
		WB-TR	N/A	N/A	N/A	N/A	N/A	N/A	11 (30)	27 (58)	N/A	N/A	165 (481)	257 (641)
		NB-L	235	100	N/A	N/A	N/A	N/A	1 (8)	1 (11)	N/A	N/A	2 (12)	3 (17)
		NB-R	175	100	N/A	N/A	N/A	N/A	2 (17)	13 (69)	N/A	N/A	47 (203)	69 (197)
		SB-L	235	100	N/A	N/A	N/A	N/A	22 (51)	52 (94)	N/A	N/A	71 (144)	158 (278)
		SB-R	175	100	N/A	N/A	N/A	N/A	N/A	2 (35)	N/A	N/A	N/A	2 (34)
9	US 41 & S Circle Dr / Driveway 7	EB-LTR	N/A	N/A	4 (19)	4 (2)	3 (18)	4 (21)	1 (11)	2 (15)	3 (17)	11 (33)	2 (13)	9 (31)
10	US 41 & South Dr / Driveway 6	EB-LTR	N/A	N/A	N/A	N/A	N/A	N/A	4 (20)	3 (18)	N/A	N/A	12 (37)	19 (57)
		WB-LTR	N/A	N/A	N/A	N/A	N/A	N/A	28 (66)	262 (513)	N/A	N/A	391 (486)	400 (429)
		NB-L	235	100	N/A	N/A	N/A	N/A	10 (36)	23 (53)	N/A	N/A	75 (234)	57 (113)
		NB-R	175	100	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	35 (185)	1 (8)
		SB-L	235	100	N/A	N/A	N/A	N/A	3 (16)	12 (39)	N/A	N/A	6 (24)	26 (66)
11	US 41 & SR 81 / Upper Woolsey Rd	EB-L	140	140	61 (108)	31 (62)	68 (116)	35 (67)	68 (116)	34 (68)	99 (160)	48 (95)	101 (207)*	49 (98)
		EB-TR	N/A	N/A	93 (149)	81 (127)	102 (160)	88 (137)	102 (159)	87 (139)	149 (215)	125 (198)	152 (237)	129 (204)
		WB-L	200	100	61 (110)	106 (164)	68 (119)	118 (182)	67 (118)	117 (184)	102 (188)*	179 (343)*	110 (239)*	198 (360)*
		WB-R	125	115	0 (50)	0 (51)	0 (51)	0 (52)	8 (69)	0 (75)	63 (125)	0 (61)	84 (218)*	510 (758)*
		NB-L	440	125	1 (6)	1 (7)	1 (6)	2 (8)	1 (7)	2 (7)	3 (11)	3 (9)	3 (8)	3 (9)
		NB-R	335	175	0 (3)	0 (26)	0 (5)	0 (11)	0 (0)	0 (14)	0 (18)	0 (39)	0 (0)	2 (46)
		SB-L	300	75	9 (25)	29 (66)	10 (28)	35 (76)	24 (59)	96 (215)	26 (92)	121 (210)	346 (547)*	728 (957)*
		SB-R	175	165	0 (0)	0 (3)	0 (0)	0 (5)	0 (0)	0 (6)	0 (2)	0 (17)	0 (2)	0 (18)
12	SR 81 & Old Dixie Hwy	EB-L	250	90	6 (22)	3 (16)	6 (24)	4 (17)	7 (26)	5 (20)	11 (34)	7 (27)	14 (59)	8 (34)
		EB-R	170	110	0 (7)	0 (11)	0 (9)	0 (14)	0 (9)	0 (15)	0 (23)	0 (30)	0 (25)	2 (33)
		WB-L	190	85	12 (40)	16 (47)	14 (45)	19 (53)	17 (54)	23 (66)	31 (108)*	37 (98)	40 (136)*	67 (174)*
		WB-R	200	90	0 (38)	0 (41)	0 (39)	0 (42)	0 (48)	0 (58)	0 (45)	0 (51)	18 (104)	544 (827)*

ID	Intersection	Turn Lane / Movement Approach	Lengths, in feet		50th (95th) Percentile Queues, in feet									
					Existing		2028 No-Build		2028 Build		2048 No-Build		2048 Build	
			Storage	Taper	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
		NB-L	155	90	16 (51)	21 (66)	18 (57)	26 (74)	22 (59)	34 (75)	37 (83)	53 (107)	40 (83)	53 (107)
		NB-R	260	100	0 (42)	0 (25)	0 (44)	0 (31)	0 (46)	0 (31)	23 (87)	0 (46)	47 (117)	14 (62)
		SB-L	240	90	31 (84)	35 (98)	38 (101)	44 (114)	78 (160)	145 (260)*	92 (174)*	107 (174)	476 (679)*	653 (1018)*
		SB-R	200	100	0 (8)	0 (18)	0 (9)	0 (20)	0 (9)	0 (19)	0 (17)	0 (24)	0 (16)	11 (35)
13	Hastings Bridge Rd & Talmadge Rd / County Landfill Rd	EB-LTR	N/A	N/A	45 (106)	54 (125)	55 (122)	66 (145)	96 (237)*	192 (371)*	116 (267)*	139 (318)*	545 (751)*	730 (961)*
		WB-LTR	N/A	N/A	0 (6)	1 (10)	0 (6)	1 (11)	0 (6)	1 (11)	1 (8)	2 (14)	1 (8)	2 (12)
		NB-L	50	50	54 (159)*	57 (199)*	70 (226)*	81 (246)*	177 (322)*	255 (426)*	231 (390)*	262 (421)*	543 (730)*	929 (1156)*
		NB-TR	N/A	N/A	29 (74)	38 (88)	35 (81)	46 (97)	45 (81)	56 (97)	73 (123)	90 (152)	79 (133)	105 (177)
		SB-L	50	50	0 (4)	1 (4)	1 (4)	1 (4)	1 (4)	1 (4)	1 (6)	1 (5)	1 (6)	1 (6)
		SB-TR	N/A	N/A	50 (130)	74 (187)	62 (150)	98 (223)	86 (157)	134 (256)	167 (309)*	272 (537)*	215 (435)*	524 (744)*
14	McDonough Rd & Hastings Bridge Rd	EB-LT	N/A	N/A	91 (223)	165 (373)	155 (339)	146 (310)	168 (362)	133 (278)	239 (498)	188 (413)	170 (339)	137 (296)
		WB-TR	N/A	N/A	30 (111)	78 (297)	44 (157)	18 (79)	49 (166)	28 (100)	163 (403)	76 (237)	81 (778*)	37 (108)
		SB-LR	N/A	N/A	27 (120)	141 (546)	79 (302)	30 (130)	237 (710*)	763* (1464*)	867* (1684*)	402 (1026*)	1098* (1673*)	1223* (1453*)
15	SR 81 & Mt Carmel Rd	EB-LT	N/A	N/A	184 (386)	130 (258)	512 (2434*)	377 (2434*)	1932* (2434*)	1560* (2949*)	2032* (3175*)	1562* (2830*)	2228* (3186*)	2198* (3065*)
		SB-LR	N/A	N/A	888* (1851*)	456 (1235*)	2113* (1597*)	1918* (1597*)	2144* (1597*)	1467* (2038*)	1515* (1960*)	1541* (1858*)	1563* (1823*)	1602* (1611*)

D.7. 2048 Build Mitigation Capacity Analysis

The existing study intersections were analyzed with possible improvements to determine how feasible it would be to lower the levels of service back to acceptable (LOS D) levels or levels seen in the existing conditions. The following possible improvements could improve traffic operations:

- Widening SR 81 to be four-lanes throughout the study network
- Widening Hastings Bridge Road / Old Dixie Highway to be four lanes between McDonough Road and SR 81
- Adding additional turn lanes where possible at each study intersection in coordination with the above road widenings as well as optimizing signal timings.

The capacity analysis results of the 2048 Build conditions with mitigations are shown in Table 10. The Synchro® output reports for 2048 Build Mitigation Conditions are included in Appendix F.

Table 10: Capacity Analysis Results –2048 Build Mitigation Conditions

ID	Intersection	Mitigation	Movement	AM		PM	
				LOS	Delay	LOS	Delay
11	US 41 & SR 81 / Upper Woolsey Rd	Road-Widening & Signal Timings	**Overall**	**D**	**46.5**	**F**	**116.9**
			EB	E	57.4	D	42.4
			WB	E	62.5	E	70.5
			NB	D	52.7	F	136.5
			SB	C	34.7	F	115.2
12	SR 81 & Old Dixie Hwy	Road-Widening & Signal Timings	**Overall**	**C**	**26.1**	**F**	**109.5**
			EB	B	17.7	B	13.4
			WB	C	28.5	F	148.3
			NB	C	32.6	C	30.0
			SB	C	28.9	F	146.6
13	Hastings Bridge Rd & Talmadge Rd / County Landfill Rd	Road-Widening & Signal Timings	**Overall**	**F**	**226.0**	**F**	**>300**
			EB	F	242.7	F	>300
			WB	C	20.9	C	24.4
			NB	F	176.9	F	>300
			SB	F	275.8	F	>300
14	McDonough Rd & Hastings Bridge Rd	Road-Widening	SB	F	>300	F	266.2
			EBL	D	31.5	F	97.9
15	SR 81 & Mt Carmel Rd	Road-Widening	SB	F	232.9	F	>300
			EBL	F	>300	F	>300

As shown in Table 10, the potential improvements would allow for traffic operations to somewhat improve from the 2048 Build conditions; however, even with these mitigations, several intersections are expected to continue to operate at undesirable Levels of Service.

E. Peak Hour Signal Warrant Analysis

E.1. Warrant 2 – Four-Hour (Peak Hour) Volume

The proposed signalized intersections were analyzed to see if traffic signals would be warranted according to warrant 2 of the Manual on Uniform Traffic Control Devices (MUTCD). The intersection of McDonough Road with Hastings Bridge Road was also analyzed as part of the possible mitigation measures. The results of the signal warrants are summarized in Table 11 below.

Table 11: Warrant 2 – Four-Hour (Peak Hour) Volume

Intersection	Condition	Highest Peak Hour Volumes		4th Highest Peak (Warrant 2)		Warrant 2 - 2 & 1 Lane Thresholds			
						Highest Peak		4th Highest Peak	
		Major	Minor	Major	Minor	Threshold	Met?	Threshold	Met?
US 41 & Talmadge Rd / Driveway 1	2028 Build	3474	333	2775	266	80	YES	80	YES
	2048 Build	6612	1062	5281	848	80	YES	80	YES
US 41 & Driveway 2A / 2B	2028 Build	3327	260	2619	205	80	YES	80	YES
	2048 Build	6243	800	4914	630	80	YES	80	YES
US 41 & N Circle Dr / Driveway 5	2028 Build	2980	88	2215	65	80	YES	80	NO
	2048 Build	5184	251	3853	187	80	YES	80	YES

As shown in Table 11, all of the proposed signalized intersections are expected to warrant a traffic signal by 2048 Build conditions. While many of them also warrant a signal during 2028 Build conditions, it is unlikely that driveway 5 will meet Warrant 1 (Eight-Hour Vehicular Volume) during this period. It is recommended that each of these intersections be signalized.

F. Driveway Turn Lane Analysis

F.1. GDOT Turn Lane Analysis

The need for turn lanes at each proposed driveway was evaluated using methodologies from the Georgia Department of Transportation (GDOT) Access Manual. The speed limit along US 41 is 45 miles per hour. The counts collected along the highway show the ADT is over 10,000 vehicles per day and the. The results of the evaluation are summarized in Table 11. No turn lane warrant was analyzed for the intersection of US 41 with Talmadge Road / Driveway 1 since a northbound left-turn lane and a southbound right-turn lane already exists.

Table 12: GDOT Turn Lane Analysis

ID	Intersection	Movement/ Turn Lane	Turn Volume	GDOT Volume Criteria	GDOT Criteria met?
8	US 41 & N Circle Dr / Driveway 5	NBR	3011 RT/Day	75 RT/Day	YES
		NBL	0 LT/Day	250 LT/Day	NO
		SBL	5385 LT/Day	250 LT/Day	YES
10	US 41 & South Dr / Driveway 6	NBR	3405 RT/Day	75 RT/Day	YES
		NBL	1899 LT/Day	250 LT/Day	YES
		SBR	0 RT/Day	75 RT/Day	NO
		SBL	162 LT/Day	250 LT/Day	NO
16	US 41 & Driveway 2A / Driveway 2B	NBR	556 RT/Day	75 RT/Day	YES
		NBL	2930 LT/Day	250 LT/Day	YES
		SBR	6810 RT/Day	75 RT/Day	YES
		SBL	4830 LT/Day	250 LT/Day	YES
17	US 41 & Driveway 3A / Driveway 3B	NBR	556 RT/Day	75 RT/Day	YES
		NBL	1506 LT/Day	250 LT/Day	YES
		SBR	4403 RT/Day	75 RT/Day	YES
		SBL	2881 LT/Day	250 LT/Day	YES
18	US 41 & Driveway 4	NBR	162 RT/Day	75 RT/Day	YES
19	US 41 & Driveway 7	NBR	1587 RT/Day	75 RT/Day	YES
20	US 41 & Driveway 8	NBR	475 RT/Day	75 RT/Day	YES

As shown in Table 12, turn lanes are warranted at every new proposed driveway along US 41. While this development is not expected to have enough volumes to warrant a northbound left-turn lane at N Circle Drive or southbound turn lanes at South Drive, it is recommended that they be included due to the high volumes along US 41.

G. Conclusion

A new master-planned mixed-use residential development is proposed for construction on undeveloped land parcels west of US 41 and south of Lovejoy Road in Henry County, Georgia (see Appendix A for site plan detail). Once the proposed development is completely built-out, it will consist of 7,160 residential units, a 180-room hotel, 100,000 square feet of village retail, and approximately 1,990,000 square feet of commercial retail.

The development will contain eight (8) access points in total:

- one (1) full-access point at US 41 and Talmadge Road as an extension driveway
- one (1) full-access point at US 41, south of the Villas at Hampton residential neighborhood
- one (1) left-in (R-CUT) access point at US 41, north of the North Drive residential neighborhood
- one (1) right-in/right-out (RIRO) access point along the east side of US 41, between North Drive and North Circle Drive
- one (1) full-access point at US 41 and North Circle Drive
- one (1) full-access point at US 41 and South Drive
- two (2) right-in/right-out (RIRO) access points along the east side of US 41, south of South Circle Drive and north of Upper Woolsey Road

The development is expected to be fully built-out by 2048 and Phase 1 is expected to be completed by 2028. Phase 1 of the development will generate a total of 28,170 new daily trips. Of these daily volumes, 919 new trips (391 entering and 525 exiting) are expected to occur during the AM peak hour while 2,122 new trips (1,115 entering and 1,007 exiting) are expected to occur during the PM peak hour. When Phase 5, the final phase, is built-out, the development will generate a total of 94,970 new daily trips. Of these daily volumes, 3,605 new trips (1,353 entering and 2,252 exiting) are expected to occur during the AM peak hour while 7,160 new trips (3,926 entering and 3,234 exiting) are expected to occur during the PM peak hour.

In existing conditions, there are several intersections and movements that operate with undesirable Levels of Service (LOS). The intersections and movements are as follows:

US 41 at Mundy's Mill Road

The eastbound and westbound approaches operate at LOS F during the AM peak hour, the eastbound approach operates at LOS E during the PM peak hour, and the westbound approach operates at LOS F during the PM peak hour. This is largely due to the signal timings favoring the northbound and southbound approaches, as well as a high cycle length of 180 seconds for signals along US 41.

US 41 at Iron Gate Boulevard / S Main Street

Similar to the intersection with Mundy's Mill Road, the eastbound and westbound approaches operate at LOS F during the AM and PM peak hours. This is largely due to the signal timings favoring the northbound and southbound approaches, as well as a high cycle length of 180 seconds for signals along US 41. Overall operations during the AM peak hour also operate at unsatisfactory LOS E.

US 41 at Tara Road

The eastbound approach operates at LOS E during both the AM and PM peak hours. Like the previous intersections, this is largely due to the signal timings favoring the northbound and southbound approaches, as well as a high cycle length of 180 seconds for signals along US 41.

US 41 at McDonough Road

The eastbound and westbound approaches operate at LOS F during the AM and PM peak hours. This is largely due to the signal timings favoring the northbound and southbound approaches, as well as a high cycle length of 180 seconds for signals along US 41.

US 41 at Lovejoy Road

The eastbound approach operates at LOS E during the AM peak hour and LOS F during the PM peak hours. This is largely due to the signal timings favoring the northbound and southbound approaches, as well as a high cycle length of 180 seconds for signals along US 41.

US 41 at Talmadge Road

The eastbound and westbound approaches operate at LOS F during both the AM and PM peak hours. This is due to the traffic intersecting a very high-volume divided highway at a stop-controlled movement and the lack of separate turn lanes for these approaches.

SR 81 at Mt Carmel Road

The southbound approach operates at LOS F during both the AM and PM peak hours. This is due to the large amount of traffic from Mt. Carmel Road intersecting with an equally high-volume highway at a stop-controlled movement. There are also no separate lanes for southbound right turns and left turns, though there are far more southbound right-turns.

In 2028 No-Build Conditions, the increase in traffic from the applied growth rate and the completion of the road widening project along US 41 causes the following conditional changes at each associated study intersection:

US 41 at Mundy's Mill Road

Traffic operations are expected to improve over existing conditions with the completion of the road widening project along US 41; however, the eastbound and westbound approaches are expected to continue to operate with undesirable LOS due to the signal timings favoring the northbound and southbound approaches. Overall traffic operations are expected to be satisfactory during both the AM and PM peak hours.

US 41 at Iron Gate Boulevard / S Main Street

Traffic operations are expected to improve over existing conditions with the completion of the road widening project along US 41; however, the eastbound and westbound approaches are expected to continue to operate with undesirable LOS due to the signal timings favoring the northbound and southbound approaches. Overall traffic operations are expected to be satisfactory during both the AM and PM peak hours.

US 41 at Tara Road

Traffic operations are expected to improve over existing conditions with the completion of the road widening project along US 41; however, the eastbound approach is expected to continue to operate with undesirable LOS due to the signal timings favoring the northbound and southbound approaches. The eastbound approach is expected to change from LOS E to F during the PM peak hour. Overall traffic operations are expected to be satisfactory during both the AM and PM peak hours.

US 41 at McDonough Road

The eastbound and westbound approaches continue to operate at LOS F during the AM and PM peak hours. The northbound and overall traffic operations are expected to change to LOS E during the AM peak hour due to the increased traffic volumes. Overall traffic operations are expected to be satisfactory during the PM peak hour.

US 41 at Lovejoy Road

The eastbound approach continues to operate at LOS E during the AM peak hour and LOS F during the PM peak hours. Overall traffic operations are expected to be satisfactory during both the AM and PM peak hours.

US 41 at Talmadge Road

The eastbound and westbound approaches continue to operate at LOS F during both the AM and PM peak hours.

US 41 at North Drive

The eastbound approach is expected to operate at LOS E during PM peak hour with the increased volumes along US 41.

SR 81 at Mt Carmel Road

The southbound approach continues to operate at LOS F during both the AM and PM peak hours.

For 2028 Build Conditions, the addition of project traffic to the study intersections mentioned above causes an increase in overall intersection and approach delay when compared to No-Build Conditions. Many of the busiest driveways are expected to operate with unsatisfactory levels of service due to already high volumes along US 41. The changes are as follows:

US 41 at Mundy's Mill Road

Overall traffic operations are expected to continue to operate similar to the 2028 No-Build Conditions.

US 41 at Iron Gate Boulevard / S Main Street

Overall traffic operations are expected to continue to operate similar to the 2028 No-Build Conditions.

US 41 at Tara Road

Overall traffic operations are expected to continue to operate similar to the 2028 No-Build Conditions.

US 41 at McDonough Road

With the increased volumes, the intersection is expected to be over-capacity, with the intersection operating at LOS F for all approaches during both the AM and PM peak hours except for the northbound and southbound approaches operating at LOS E during the AM peak hour, and the northbound approach at LOS E during the PM peak hour.

US 41 at Lovejoy Road

With the increased volumes, the intersection is expected to be over-capacity, with the intersection operating at LOS F during the PM peak hour and the westbound approach changing to LOS E during the PM peak hour.

US 41 at Talmadge Road / Site Driveway 1

Overall traffic operations are expected to improve with the installation of a traffic signal, however, the westbound approach is expected to operate LOS E during both the AM and PM peak hours, and the eastbound approach at LOS F during the PM peak hour.

US 41 at North Circle Drive / Site Driveway 5

Overall traffic operations are expected to improve with the installation of a traffic signal, however, the westbound approach is expected to operate LOS F and E during the AM and PM peak hours, respectively, and the eastbound approach at LOS F during both the AM and PM peak hours.

US 41 at South Drive / Site Driveway 6

The eastbound, westbound approaches and northbound left-turn is expected to operate LOS F during the PM peak hour.

Hastings Bridge Road at Talmadge Road / County Landfill Road

The intersection is expected to be over capacity during the PM peak hour with the overall traffic operations, eastbound approach, and northbound approach expected to operate at LOS F. During the AM peak hour, the northbound approach is expected to operate at LOS E during the AM peak hour.

SR 81 at Mt Carmel Road

The southbound approach continues to operate at LOS F during the PM peak hour.

US 41 & Driveway 2A / Driveway 2B

The eastbound and westbound approaches are expected to operate at LOS F during both the AM and PM peak hours.

For 2048 No-Build Conditions, the large amount of expected background growth in the study area is expected to cause the roadways to be over-capacity when compared to 2028 No-Build Conditions in which the roadways are already expected to be over-capacity. The changes from the 2028 No-Build Conditions are as follows:

US 41 at Mundy's Mill Road

Overall traffic operations are expected to worsen to LOS E during the PM peak hour due to increased volumes, and the westbound approach changes to LOS F during the PM peak hour. Overall traffic operations are expected to be satisfactory during the AM peak hour.

US 41 at Iron Gate Boulevard / S Main Street

The eastbound and westbound approaches are expected to continue to operate with undesirable LOS due to the signal timings favoring the northbound and southbound approaches. Overall traffic operations are expected to be satisfactory during both the AM and PM peak hours.

US 41 at Tara Road

Overall traffic operations are expected to worsen to LOS E during the PM peak hour due to increased volumes. The eastbound approach is expected to continue to operate with undesirable LOS due to the signal timings favoring the northbound and southbound approaches. Overall traffic operations are expected to be satisfactory during the AM peak hour.

US 41 at McDonough Road

With the increased volumes, the intersection is expected to be over-capacity, with the intersection operating at LOS F on all four approaches during both the AM and PM peak hours.

US 41 at Lovejoy Road

With the increased volumes, the intersection is expected to be over-capacity, with the intersection operating at LOS F on all four approaches during both the AM and PM peak hours except the westbound approach, which is expected to operate at LOS D during the AM peak hour.

US 41 at Talmadge Road

The southbound left-turns are expected to have a high level of delay due to increased volumes along US 41. The southbound left-turn movement is expected to operate at LOS F during both the AM and PM peak hours.

US 41 at North Drive

The eastbound approach is expected to operate at LOS E during AM peak hour and LOS F during the PM peak hour with the increased volumes along US 41.

US 41 at South Circle Drive

The eastbound approach is expected to operate at LOS F during both the AM and PM peak hours with the increased volumes along US 41.

US 41 at SR 81/Upper Woolsey Road

The westbound approach changes to LOS E during the PM peak hour. Overall traffic operations are expected to be satisfactory during both the AM and PM peak hours.

Hastings Bridge Road at Talmadge Road / County Landfill Road

With increased volumes along the roadways, the overall traffic operations and northbound approach is expected to operate at LOS F during both the AM and PM peak hours. Also, the southbound approach is expected to operate at LOS E during the PM peak hour.

McDonough Road at Hastings Bridge Road

The southbound approach is expected to operate at LOS F during both the AM and PM peak hours due to the increased traffic volumes.

SR 81 at Mt Carmel Road

The southbound approach continues to operate at LOS F during both the AM and PM peak hours.

For 2048 Build Conditions, the addition of project traffic to the study intersections causes a large increase in overall intersection and approach delay when compared to 2048 No-Build conditions in which the roadways are already expected to be over-capacity. The changes from the 2048 No-Build conditions are as follows:

US 41 at Mundy's Mill Road

Overall traffic operations are expected to continue to operate similarly to the 2048 No-Build conditions.

US 41 at Iron Gate Boulevard / S Main Street

Overall traffic operations are expected to continue to operate similarly to the 2048 No-Build conditions.

US 41 at Tara Road

Overall traffic operations are expected to continue to operate similarly to the 2048 No-Build conditions.

US 41 at McDonough Road

With the increased volumes, the intersection is expected to be over-capacity, with the intersection operating at LOS F for all approaches during both the AM and PM peak hours.

US 41 at Lovejoy Road

With the increased volumes, the intersection is expected to be over-capacity, with the intersection operating at LOS F during the AM and PM peak hours, except for the westbound approach during the AM peak hour which operating at LOS D.

US 41 at Talmadge Road / Site Driveway 1

Overall traffic operations are expected to continue to operate similar to the 2048 No-Build conditions.

US 41 at North Drive

The eastbound approach and the northbound left-turn is expected to operate at LOS E during PM peak hour.

US 41 at North Circle Drive / Site Driveway 5

Overall traffic operations are expected to improve with the installation of a traffic signal, however, the westbound approach is expected to operate LOS F during both the AM and PM peak hours.

US 41 at South Circle Drive

The eastbound approach is expected to operate at LOS E during the PM peak hour.

US 41 at South Drive / Site Driveway 6

The eastbound and westbound approaches and northbound and southbound left-turn are expected to operate LOS F during both the AM and PM peak hours.

US 41 & SR 81 / Upper Woolsey Road

The eastbound and southbound approaches are expected to operate at LOS F during the AM peak hour, and the eastbound, westbound and southbound approaches are expected to operate at LOS F during PM peak hour.

SR 81 at Old Dixie Highway

The eastbound and westbound approaches are expected to operate at LOS E during the AM peak hour, and the northbound and southbound approaches are expected to operate at LOS F during PM peak hour.

Hastings Bridge Road at Talmadge Road / County Landfill Road

The intersection is expected to be over capacity during the PM peak hour with the overall traffic operations, eastbound approach, northbound and southbound approaches expected to operate at LOS F during the PM peak hour, and the eastbound and northbound approaches expected to operate at LOS F during AM peak hour.

McDonough Road at Hastings Bridge Road

The southbound approach is expected to operate at LOS F during both the AM and PM peak hours, and the eastbound left-turn during the PM peak hour.

McDonough Road at Hastings Bridge Road

The southbound approach continues to operate at LOS F during both the AM and PM peak hours and the eastbound left-turn changes to LOS F during the PM peak hour.

SR 81 at Mt Carmel Road

The southbound approach continues to operate at LOS F during both the AM and PM peak hours and the eastbound left-turn changes to LOS F during both the AM and PM peak hours.

US 41 & Driveway 2A / Driveway 2B

The eastbound and westbound approaches are expected to operate at LOS F during both the AM and PM peak hours and the northbound and southbound approaches expected to operate at LOS F during the PM peak hour.

US 41 & Driveway 3A / Driveway 3B

All four approaches are expected to operate at LOS F during the PM peak hour, and the northbound approach is expected to operate at LOS E during the AM peak hour.

US 41 & Driveway 4

The westbound approach is expected to operate at LOS F during the PM peak hour.

US 41 & Driveway 7

The westbound approach is expected to operate at LOS F during the PM peak hour.

US 41 & Driveway 8

The westbound approach is expected to operate at LOS F during the PM peak hour.

Queueing analysis suggests that the existing roadway facilities in the study may become overloaded under future traffic conditions. In No-Build Conditions, the traffic expected to be generated by the background growth in the area contributes to the delays and queues at each intersection where approaches operate at undesirable Levels of Service (LOS) E or F. By 2048 the increase in background traffic is expected to cause most all approaches to be well over capacity. In 2028 Build Conditions, the additional site traffic generated by the proposed development minimally contributes to the delays and queues at each intersection, however, by the 2048 Build Conditions, the additional project traffic is expected to cause most remaining intersections to be over-capacity.

H. Recommendations

From the conducted analysis, the following roadway improvement mitigations will be needed at the below study intersections:

US 41 & Talmadge Road / Driveway 1

- Install a traffic signal, if warranted and as approved by GDOT/Henry County
- Install additional westbound and eastbound lanes for left-turn lanes.

US 41 & Driveway 2A / Driveway 2B

- Install a traffic signal, if warranted and as approved by GDOT/Henry County
- Install two eastbound left-turn lanes, and a shared through and right-turn lane.
- Install a separate westbound left-turn, and a shared through and right-turn lane.
- Add northbound and southbound right-turn lanes and left-turn lanes.

US 41 & Driveway 3A / Driveway 3B

- Install a R-Cut Intersection with northbound and southbound left-turn and right-turn lanes

US 41 & North Drive

- Convert intersection to a R-Cut

US 41 & Driveway 4

- Add a northbound right-turn lane.

US 41 & N Circle Drive Driveway 5

- Install a traffic signal, if warranted and as approved by GDOT/Henry County
- Install an eastbound left-turn and a shared through / right-turn lane.
- Install a westbound left-turn and a shared through / right-turn lane.
- Add northbound right-turn lane and convert the existing southbound U-turn lane into a left-turn lane.

US 41 & S Circle Dr

- Convert to a Right-In / Right-Out intersection.

US 41 & South Drive / Driveway 6

- Add a northbound left-turn and right-turn lane.
- Add a southbound left-turn and right-turn lane.

US 41 & Driveway 7

- Add a northbound right-turn lane.

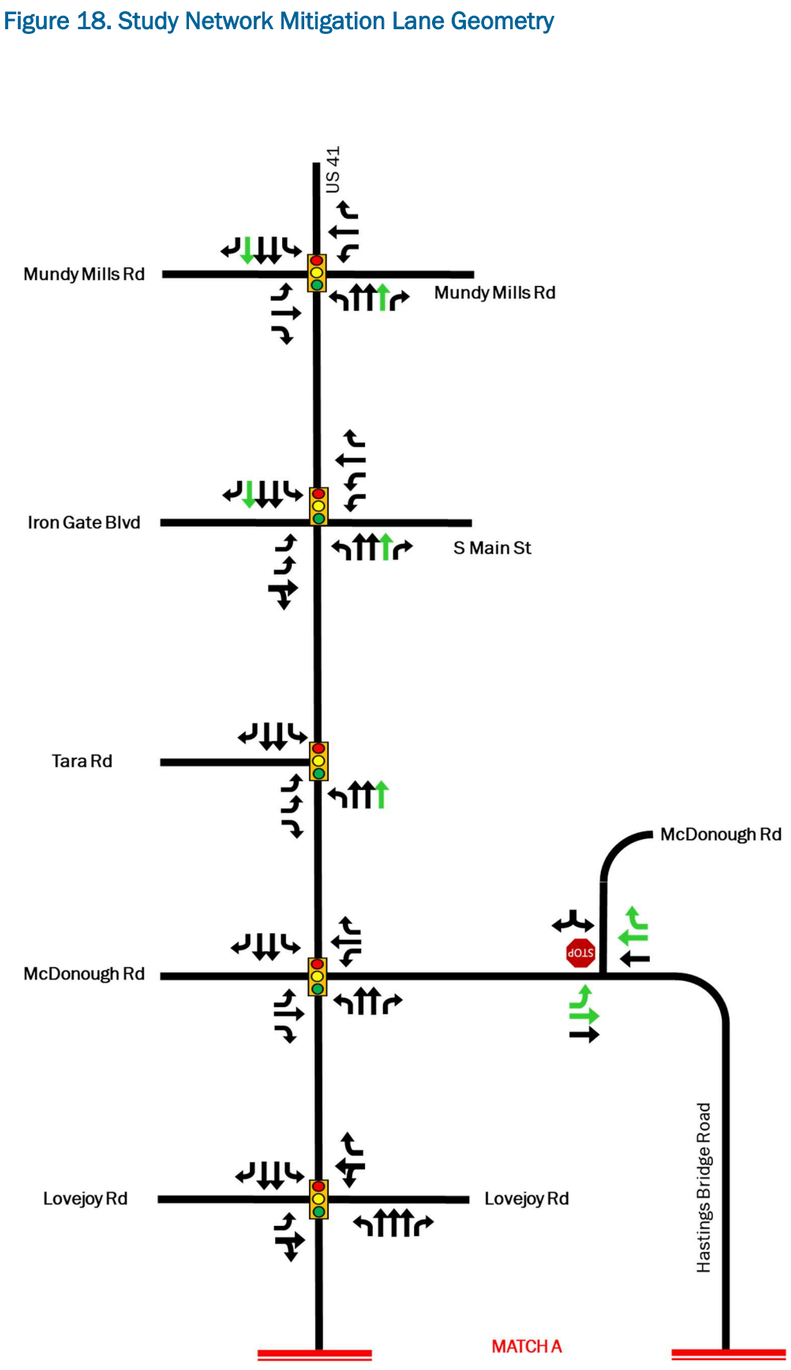
US 41 & Driveway 8

- Add a northbound right-turn lane.

In addition to the driveway improvement mitigations mentioned above, all signalized study intersections should have optimized signal timing cycle length improvements to accommodate future traffic volumes during peak hours.

The County should also investigate widening the roadways in the study area as it is expected that they will become over-capacity without the development traffic by 2048. The County should also consider intersection improvements along Hastings Bridge Road, and SR 81 as the roadways are expected to be at or near capacity without the development. Figure 18 shows all of the potential mitigations and changes to the study network.

Figure 18. Study Network Mitigation Lane Geometry



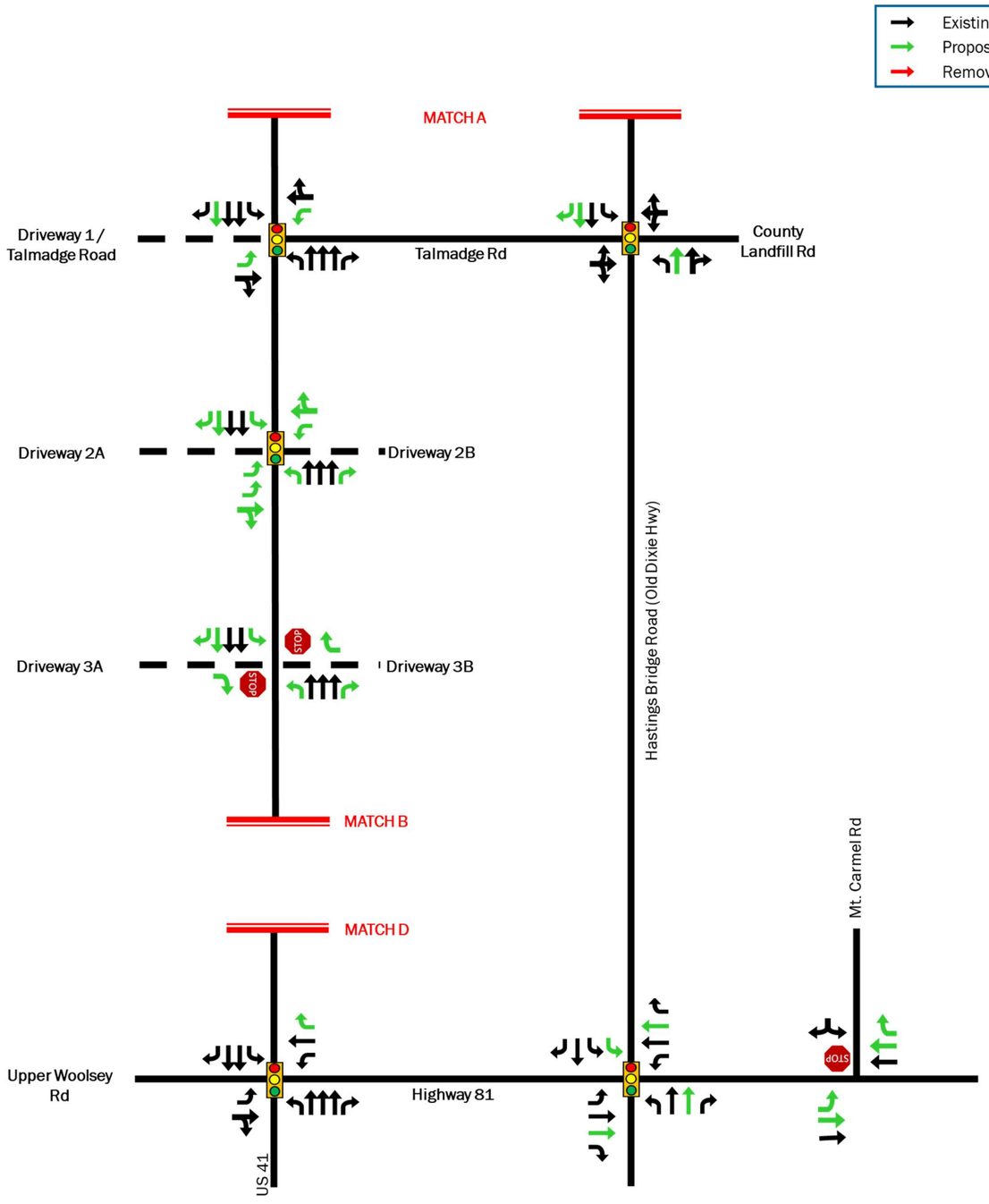


Figure 21: Study Network Mitigation Lane Geometry (Continued)