

**MEMO****DATE** 10/14/2020**PROJECT** West Pryor Village Traffic Impact Study

TO Mr. Michael Park, P.E., PTOE
 City Traffic Engineer
 City of Lee's Summit – Public Works
 220 SE Green Street
 Lee's Summit, MO 64063

FROM Lisa VanDenBerg, P.E.

SUBJECT New West Pryor Village Site Plan Effects from Previous 2018 Traffic Impact Study

MEC completed an updated analysis comparing the trips generated by the previous site plan update completed September 2018 with the new 2020 proposed site plan. Both site plans are attached to this memo for reference. The larger changes between the site plans are the conversion of the single-family homes to townhouses, the reconfiguration of the apartment from one to two buildings (although about same number of units), the addition of more restaurants and small pockets of retail space and the change in some restaurants from sit-down to fast food.

The trips for the study site were generated using information from the data compiled by the Institute of Transportation Engineers (ITE) in their report Trip Generation Manual, 10th Edition, which contains updated trip generation data and equations. A full breakdown of trips generated for both site plans are attached as part of the Appendix of this memo. Below, in Table 1, shows the total trips generated by each site plan as well as the difference of trips generated by each site plan. As can be seen, the number of trips generated between the two site plans is fewer daily trips but more trips occurring during the peak hour. This is primarily because of the restaurant uses that are typically visited during the peak hours and not frequented as much throughout the day. There is a 5.5% overall decrease in daily trips generated, an increase of 25% of trips during the morning peak hour, and an increase of 19% during the evening peak hour.

Table 1 - Trips Generated by Site Plan and Comparison

	Daily	AM Total	PM Total	AM Enter	AM Exit	PM Enter	PM Exit
2018 Site Plan	21,084	1,307	1,781	678	629	988	793
2020 New Site Plan	19,939	1,632	2,107	884	749	1,190	939
Difference between 2018 and 2020 Site Plan	-1,145	325	326	206	120	202	146

While these peak hour trips are distributed between many access drives, an analysis of the impact of these additional trips was completed to ensure that acceptable levels of operation are still attained. Table 2 below shows the existing levels of service (LOS) prior to any improvements, as well as the LOS for the complete development (final design) for both the September 2018 site plan update as well as the LOS for the new 2020 site plan.

The updated traffic volumes based on the different scenarios were input into the proposed Synchro files. The signal timings were not adjusted for a direct comparison as to how the traffic volumes impact operations. As expected, the LOS does not change much between the 2018 and 2020 site plans. No signalized intersection has a LOS lower than C, which is still acceptable per the City of Lee's Summit's "Level of Service Policy." The right-in, right-out would function at LOS C during the PM peak hour instead of LOS B. Black Twig Lane and Chipman Road, an unsignalized intersection, does still have a LOS B during the AM peak hour and LOS E during the PM peak hour. The signalized intersection at Lowenstein Drive would experience an overall LOS C during the PM peak hour but at 28.6 seconds of delay, this is well within the lower range of LOS C.

Table 2 - 2018 and 2020 Final Development LOS Comparison

Intersection	2018 Existing AM LOS	2018 Existing PM LOS	Final Design AM LOS (2018)	Final Design PM LOS (2018)	Final Design AM LOS (New-2020)	Final Design PM LOS (New-2020)
I-470 South Terminal	B	B	B	C	B	C
Summit Woods						
Crossing	A	B	B	C	B	C
Right-In, Right-Out	N/A	N/A	B*	B*	B*	C*
Lowenstein Drive	B/C*	D/E*	B	B	B	C
Chipman Road & Pryor Road	C	C	C	C	C	C
Black Twig Lane & Lowenstein Drive	A*	A*	A/B*	A/B*	B/B*	B/B*
Black Twig Lane & Chipman Road	B*	C*	B*	E*	B*	E*

When considering the movement LOS, there are more slight changes. Exhibit 3 from the previous report is attached to this memo with the movement LOS for the final development included in red for comparison. This exhibit also shows a change in expected 95%-ile queue lengths where it had previously been reported. While there are slight changes in some, overall, the movement LOS remain the same. As stated in the last memorandum, it is important to note, that the priority is given to the Pryor Road corridor over the intersecting side roads that provide access to the development. Adjustments in signal timings can result in a better movement LOS to the side roads, while a slight decline would be seen for movements on Pryor Road. Overall, the intersection LOS would remain nearly the same if these adjustments were to be made.

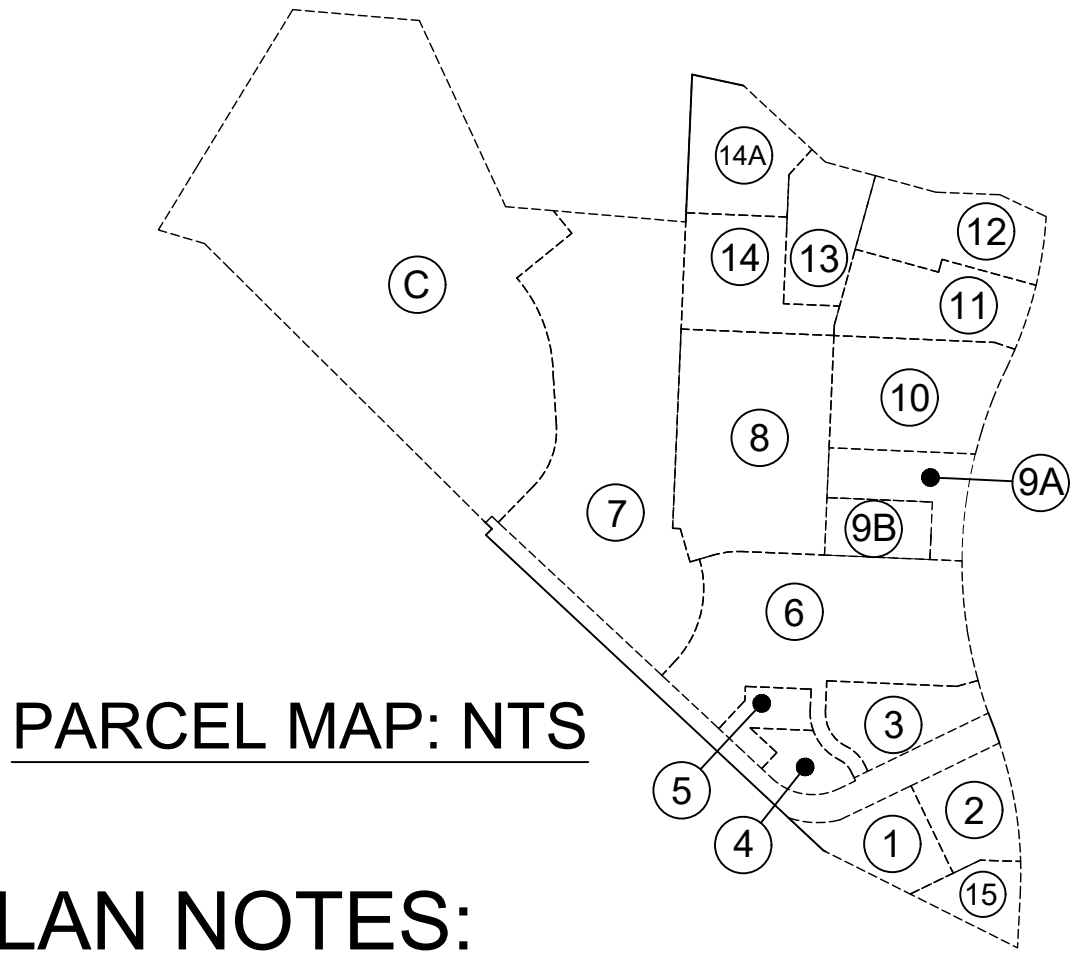
Traffic volumes at the intersection of Black Twig Lane and Chipman Road were checked against criteria for consideration of traffic signal installation. The intersection would not meet signal

warrant criteria for any of the three volume-based warrants in the Manual on Uniform Traffic Control Devices (MUTCD).

Volumes for the intersection of Black Twig Lane and Lowenstein Drive were checked against the criteria for potential placement of a multi-way stop condition using guidelines in the MUTCD. The volume-based criteria were unsatisfied. Therefore, the side street stop control condition should be used.

Figures 4 and Figure 5 of the appendix detail the distribution of trips for both the 2018 Site Plan and the 2020 Site Plan at the two Black Twig intersections. Figure 6 shows the difference in the number of trips between these two site plans for both the Black Twig/Lowenstein intersection and the Black Twig/Chipman intersection.

As the LOS are expected to stay at acceptable levels, the previous study's recommendations hold true. As roadway and intersection construction has been completed based on the recommendations, further improvements to the access drives along Pryor Road and along Lowenstein Drive are not suggested at this time.



PARCEL MAP: NTS

PLAN NOTES:

STREETS OF WEST PRYOR - DEVELOPMENT PLAN
SK-77_9/25/20

PARCEL 1: RESTAURANT (PARCEL 67,758 SQFT = 1.56 ACRES)
- 5,549 SQFT FULL SERVICE DINE-IN RESTAURANT WITH SURFACE PARKING & PATIO

PARCEL 2: RESTAURANT (PARCEL 71,216 SQFT = 1.63 ACRES)
- 3,200 (SOUTH PAD) SQFT FULL SERVICE DINE-IN RESTAURANT WITH SURFACE PARKING & PATIO

PARCEL 3: RESTAURANT (PARCEL 76,395 SQFT = 1.75 ACRES)
- 2,503 SQFT RESTAURANT WITH DRIVE THRU, PATIO AND SURFACE PARKING
- 2,403 SQFT TENANT WITH SURFACE PARKING
- 2,003 SQFT TENANT WITH PATIO AND SURFACE PARKING

PARCEL 4: DRIVE THRU RESTAURANT (PARCEL 33,424 SQFT = .77 ACRES)
- 706 SQFT DRIVE UP RESTAURANT WITH SURFACE PARKING

PARCEL 5: MEDICAL (PARCEL 32,821 SQFT = .75 ACRES)
- 6,500 SQFT MEDICAL WITH SURFACE PARKING

PARCEL 6: GROCERY STORE (PARCEL 311,668 SQFT = 7.15 ACRES)
- 63,119 SQFT GROCERY STORE WITH SURFACE PARKING

PARCEL 7: SENIOR LUXURY APARTMENT COMPLEX (PARCEL 666,437 SQFT = 10.01 ACRES)
- 165 UNIT AGE RESTRICTED APARTMENTS WITH SURFACE PARKING & COURTYARD

PARCEL 8: APARTMENTS WITH CLUBHOUSE & RETAIL/RESTAURANT (PARCEL 268,862 SQFT = 6.17 ACRES)
- MULTI STORY APARTMENTS WITH UNDERGROUND PARKING DECK (PARKING DECK NOT SHOWN), CLUBHOUSE AND POOL
- 250 UNITS
- 15,000 SQFT RETAIL/ RESTAURANT & SURFACE PARKING

PARCEL 9A: MULTI-TENANT BUILDING (PARCEL 71,401 SQFT = 1.64 ACRES)
- 4,000 SQFT RESTAURANT COMMON WALL BUILDING WITH SITE FEATURES & SURFACE PARKING
- 4,000 SQFT RETAIL COMMON WALL BUILDING WITH SITE FEATURES & SURFACE PARKING

PARCEL 9B: RESTAURANT (PARCEL 48,528 SQFT = 1.11 ACRES)
- 4,000 SQFT BUILDING WITH SITE FEATURES & SURFACE PARKING

PARCEL 10: MULTI-TENANT BUILDING (PARCEL 145,724 SQFT = 3.35 ACRES)
- 6,500 SQFT COMMON WALL BUILDING WITH SITE FEATURES & SURFACE PARKING
- 1,600 SQFT COMMON WALL BUILDING WITH SITE FEATURES & SURFACE PARKING
- 4,600 SQFT COMMON WALL BUILDING WITH SITE FEATURES & SURFACE PARKING

PARCEL 11: FREE STANDING RESTAURANT (PARCEL 111,008 SQFT = 2.55 ACRES)
- 7,500 SQFT FULL SERVICE DINE-IN RESTAURANT WITH SITE FEATURES & SURFACE PARKING

PARCEL 12: FREE STANDING RESTAURANT (PARCEL 108,275 SQFT = 2.49 ACRES)
- 7,500 SQFT FULL SERVICE DINE-IN RESTAURANT WITH SITE FEATURES & SURFACE PARKING

PARCEL 13: RESTAURANT (PARCEL 81,134 SQFT = 1.86 ACRES)
- 7,000 SQFT RESTAURANT WITH SURFACE PARKING

PARCEL 14: RESTAURANT (PARCEL 106,702 SQFT = 2.44 ACRES)
- RESTAURANT WITH BALL COURTS AND SURFACE PARKING

PARCEL 14A: RESTAURANT BALL COURTS (PARCEL 102,110 SQFT = 2.35 ACRES)
- BALL COURTS FOR PARCEL 14 RESTAURANT WITH SURFACE PARKING

PARCEL 15: POND/ WATER FEATURE (PARCEL 44,366 SQFT = 1.02 ACRES)
- WATER FEATURE

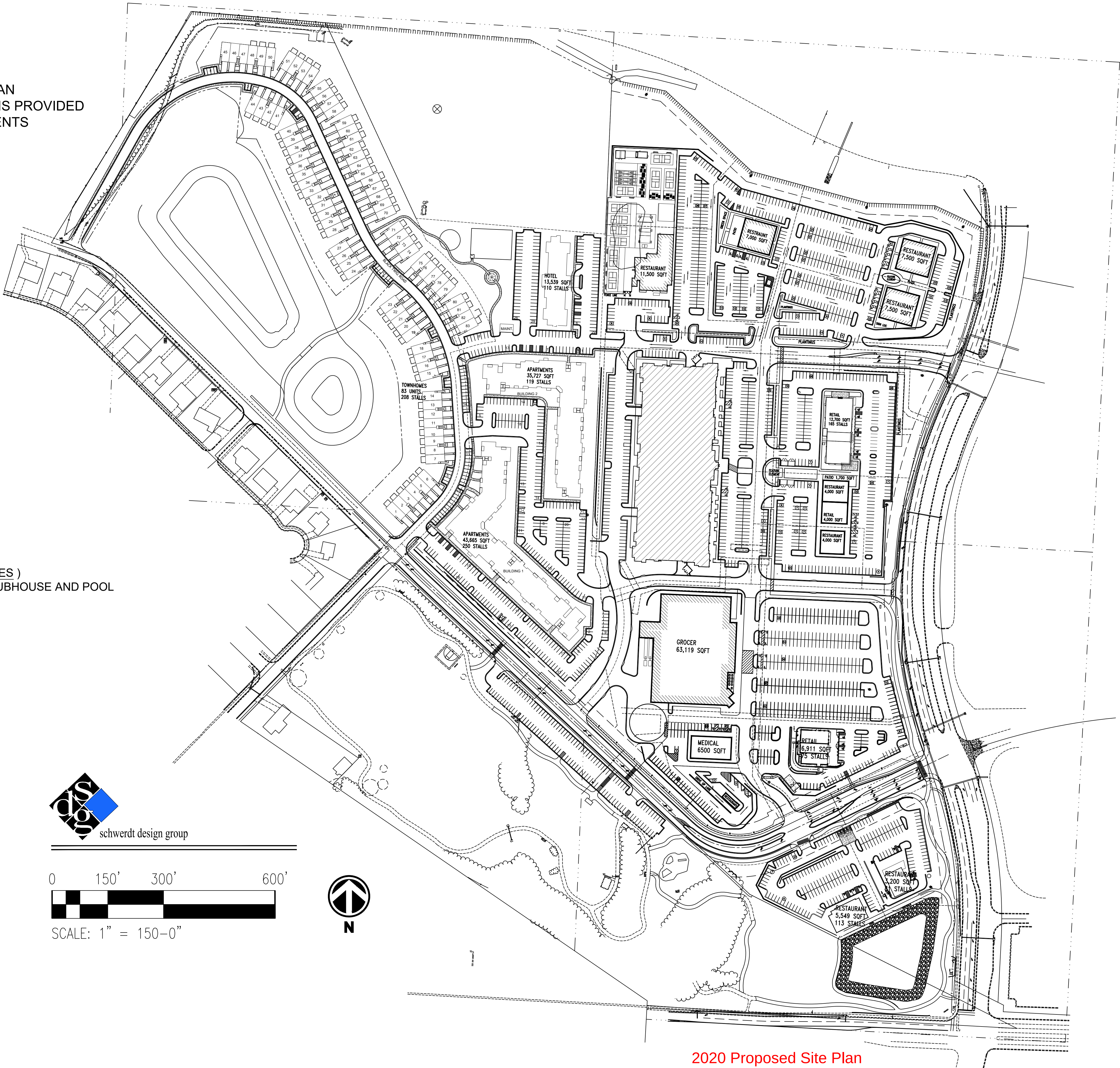
PARCEL 16: SINGLE FAMILY RESIDENTIAL (PARCEL 1,051,916 SQFT = 24.1 ACRES)
- SINGLE FAMILY LOTS SURROUNDING WATER FEATURE

SETBACK & HEIGHT RESTRICTIONS:

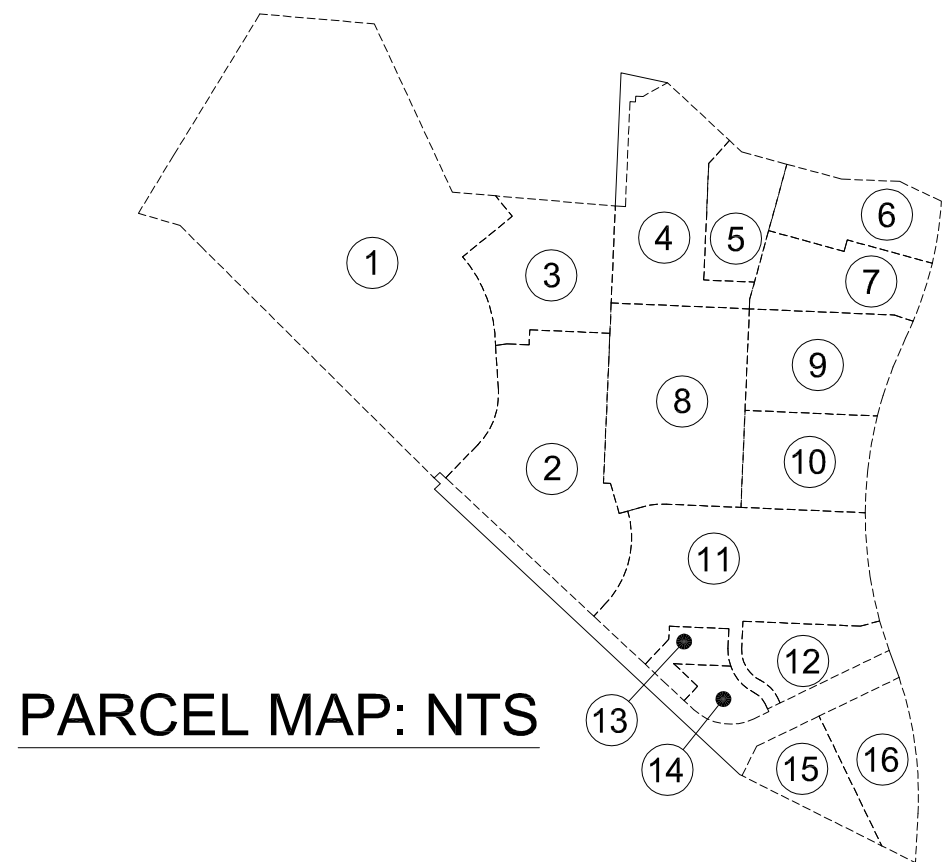
MIXED USE - TO BE DETERMINED

PARKING NOTES:

- 1) SURFACE PARKING IS SHOWN IN PLAN
- 2) APARTMENT PARKING OF 300 PLUS IS PROVIDED BY PARKING DECK UNDER APARTMENTS (PARKING DECK NOT SHOWN)



2020 Proposed Site Plan



PARCEL MAP: NTS

PLAN NOTES:

**STREETS OF WEST PRYOR - DEVELOPMENT PLAN
SK-31_9/13/18**

PARCEL 1: SINGLE FAMILY RESIDENTIAL (PARCEL 1,051,916 SQFT = 24.1 ACRES)
- SINGLE FAMILY LOTS SURROUNDING WATER FEATURE

PARCEL 2: SENIOR LUXURY APARTMENT COMPLEX (PARCEL 297,278 SQFT = 6.8 ACRES)
- 165 UNIT AGE RESTRICTED APARTMENTS WITH SURFACE PARKING & COURTYARD

PARCEL 3: BALL COURTS (PARCEL 164,385 SQFT = 3.8 ACRES)
- SITE IMPROVEMENTS LIMITED TO COURTS/ PARKING & SERVICE STRUCTURE

PARCEL 4: HOTEL (PARCEL 190,712 SQFT = 4.37 ACRES)
- HOTEL WITH AMENITIES AND POOL & SURFACE PARKING

PARCEL 5: FREE STANDING RESTAURANT (PARCEL 81,134 SQFT = 1.86 ACRES)
- 7,500 SQFT RESTAURANT WITH SURFACE PARKING

PARCEL 6: FREE STANDING RESTAURANT (PARCEL 108,277 SQFT = 2.48 ACRES)
- 7,500 SQFT FULL SERVICE DINE-IN RESTAURANT WITH SITE FEATURES & SURFACE PARKING

PARCEL 7: FREE STANDING RESTAURANT (PARCEL 111,006 SQFT = 2.54 ACRES)
- 7,500 SQFT FULL SERVICE DINE-IN RESTAURANT WITH SITE FEATURES & SURFACE PARKING

PARCEL 8: APARTMENTS WITH CLUBHOUSE & RETAIL/RESTAURANT (PARCEL 302,051 SQFT = 6.9 ACRES)
- MULTI STORY APARTMENTS WITH UNDERGROUND PARKING DECK (PARKING DECK NOT SHOWN), CLUBHOUSE AND POOL
- 250 UNITS
- 15,000 SQFT RETAIL/ RESTAURANT & SURFACE PARKING

PARCEL 9: MULTI-TENANT BUILDING (PARCEL 145,738 SQFT = 3.34 ACRES)
- 6,500 SQFT COMMON WALL BUILDING WITH SITE FEATURES & SURFACE PARKING
- 3,000 SQFT COMMON WALL BUILDING WITH SITE FEATURES & SURFACE PARKING

PARCEL 10: MULTI-TENANT BUILDING (PARCEL 119,926 SQFT = 2.8 ACRES)
- 3,500 SQFT COMMON WALL BUILDING WITH SITE FEATURES & SURFACE PARKING
- 4,000 SQFT COMMON WALL BUILDING WITH SITE FEATURES & SURFACE PARKING

PARCEL 11: GROCERY STORE (PARCEL 311,566 SQFT = 7.1 ACRES)
- 63,119 SQFT GROCERY STORE WITH SURFACE PARKING

PARCEL 12: RESTAURANT (PARCEL 76,395 SQFT = 1.8 ACRES)
5,500 SQFT RESTAURANT WITH DRIVE THRU AND SURFACE PARKING

PARCEL 13: MEDICAL (PARCEL 32,914 SQFT = .75 ACRES)
- 6,500 SQFT MEDICAL WITH SURFACE PARKING

PARCEL 14: DRIVE THRU RESTAURANT (PARCEL 33,421 SQFT = .76 ACRES)
- 706 SQFT DRIVE UP RESTAURANT WITH SURFACE PARKING

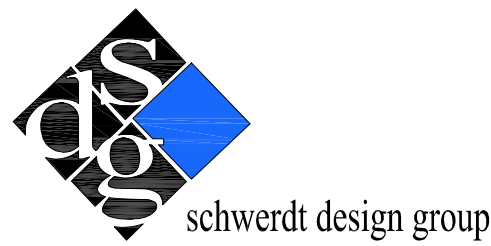
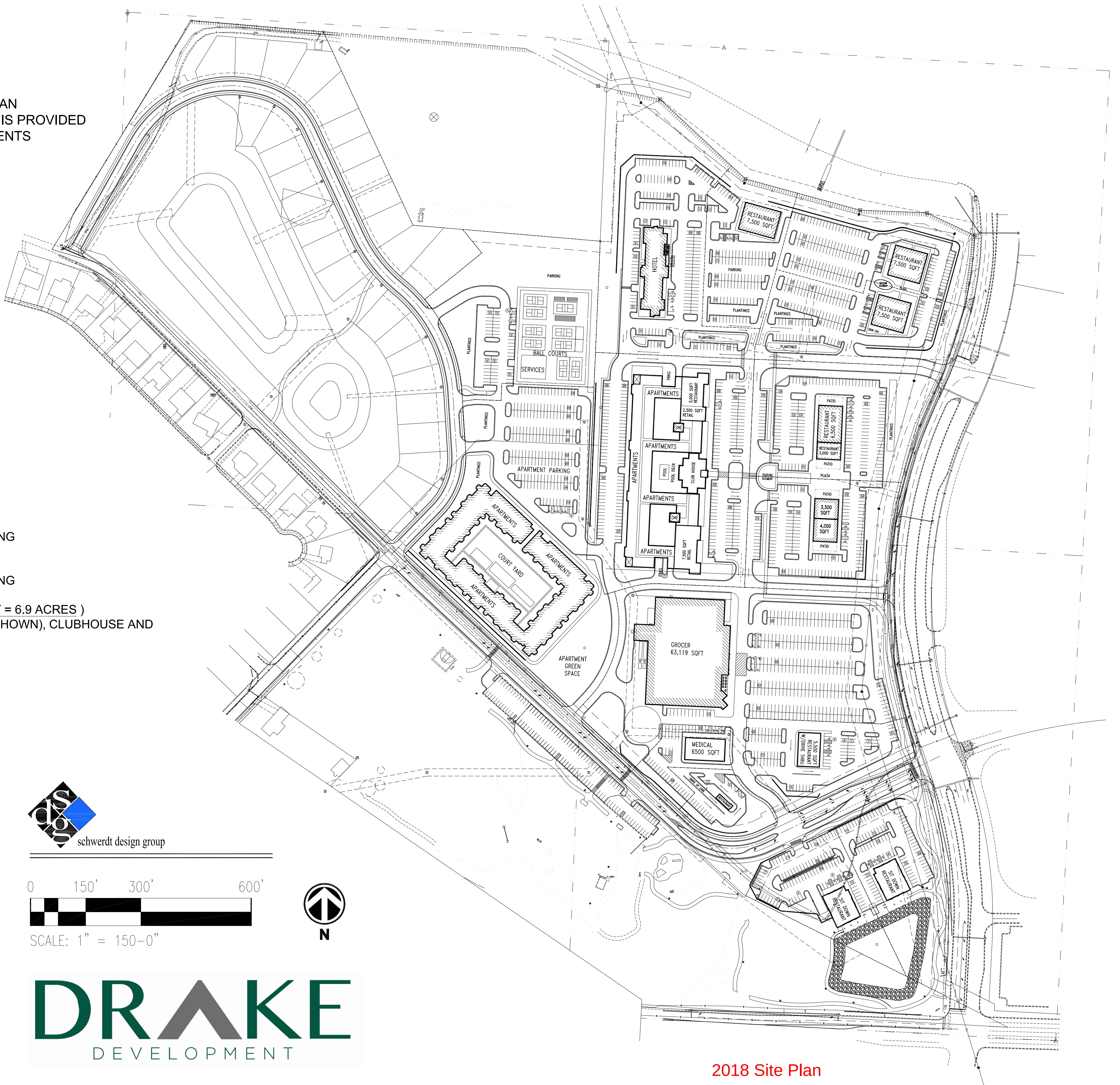
PARCEL 15: RESTAURANT (PARCEL 73,910 SQFT = 1.7 ACRES)
- 6,500 SQFT FULL SERVICE DINE-IN RESTAURANT WITH SURFACE PARKING

PARCEL 16: RESTAURANT (PARCEL 103,695 SQFT = 2.4 ACRES)
- 6,500 SQFT FULL SERVICE DINE-IN RESTAURANT WITH SURFACE PARKING

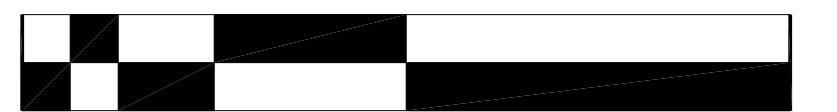
SETBACK & HEIGHT RESTRICTIONS:
MIXED USE - TO BE DETERMINED

PARKING NOTES:

- 1) SURFACE PARKING IS SHOWN IN PLAN
- 2) APARTMENT PARKING OF 300 PLUS IS PROVIDED BY PARKING DECK UNDER APARTMENTS (PARKING DECK NOT SHOWN)



0 150' 300' 600'



SCALE: 1" = 150'-0"



DRAKE
DEVELOPMENT

Trip Generation - 10th Edition - October 2020

Parcel (#)	Building Use (text)	Phase 1 or 2	Dwelling Units (#)	Building Size Sq Ft (sq ft)	ITE Land Use Code (#)	Comments (text)	Trip Ends						
							Daily (trips)	AM Total (trips)	PM Total (trips)	AM Enter (trips)	AM Exit (trips)	PM Enter (trips)	PM Exit (trips)
1	Sit down Restaurant	1		6,500	932	High Turnover (Sit-Down) Restaurant	729		64			39	24
2	Fast food restaurant	1		3,200	934	Fast-Food Restaurant with Drive-Through Window	1,507	129	105	66	63	54	50
3	Fast food restaurant	1		4,650	934	Fast-Food Restaurant with Drive-Through Window	2,190	187	152	95	92	79	73
3	Retail	1		2,260	820	Shopping Center	457	153	33	95	58	16	17
4	Drive Through Only Restaurant	1		710	935	Fast-Food Restaurant Drive-Through No Indoor Seating	326	24	30	12	12	15	15
5	Medical	1		6,500	630	Clinic	248	24	21	19	5	6	15
6	Grocery	1		63,500	850	Peak Hour of Adjacent Street Used	5,714	243	557	146	97	284	273
7 (Plat 2 Replat Lot2)	Apartments	4	184		221	Multifamily Housing (Mid-Rise)	1001	62	80	16	46	49	31
8	Apartments & Clubhouse	3	237		220	Peak Hour of Adjacent Street Used	1751	108	127	25	83	80	47
8	Retail	3		6,000	820	Shopping Center	887	155	68	96	59	33	35
8	Dine-in Restaurant	3		11,000	932	High Turnover (Sit-Down) Restaurant	1,234	109	107	60	49	67	41
8	Office	3		2,000	715	Single Tenant Office Building	23	4	3	3	1	0	3
8	Fitness	3		3,500	492	Health/Fitness Club		5	12	3	2	7	5
9	Sit down Restaurant	3		8,000	932	High Turnover (Sit-Down) Restaurant	897		78			48	30
9	Retail	3		4,000	820	Shopping Center	674	154	50	95	58	24	26
10	Sit down Restaurant	3		11,250	932	High Turnover (Sit-Down) Restaurant	1,262		110			68	42
10	Retail	3		1,600	820	Shopping Center	361	153	25	95	58	12	13
11	Sit down Restaurant	2		8,500	932	High Turnover (Sit-Down) Restaurant	954		83			51	32
12	Sit down Restaurant	2		8,500	932	High Turnover (Sit-Down) Restaurant	954		83			51	32
13	Sit down Restaurant	2		7,500	932	High Turnover (Sit-Down) Restaurant	841		73			45	28
14	Sit down Restaurant w/ courts*	2		11,500	932	High Turnover (Sit-Down) Restaurant	1,290		112			84	51
Plat 2 Lot 3	Hotel	Tract C	88		310	Hotel	1262	84	82	50	34	44	38
Plat 2 Lot 1	Townhomes	5	83		220	Multifamily Housing (Low-Rise)	587	40	50	9	31	32	19
	Total		0				19,939	1,632	2,107	884	749	1,190	939

* This restaurant includes athletic/activity courts. An extra 20% trips was added to the generated trips to account for busier than normal activity.

	Daily	AM Total	PM Total	AM Enter	AM Exit	PM Enter	PM Exit
Original Study Site	19,334	1,339	1,741	655	684	968	773
2018 Updated Site Plan	21,084	1,307	1,781	678	629	988	793
2020 Updated Site Plan	19,939	1,632	2,107	884	749	1,190	939
Difference between 2018 Update and 2020 Updated Site	-1,145	325	326	206	120	202	146

Trip Generation - 10th Edition - October 2018 Site Plan

									Trip Ends						
Parcel	Building Use	Phase 1 or 2	Dwelling Units		Building Size Sq Ft	ITE Land Use Code	ITE Page Number	Comments	Daily	AM Total	PM Total	Am Enter	Am Exit	PM Enter	PM Exit
(#)	(text)		(#)		(sq ft)	(#)	(#)	(text)	(trips)	(trips)	(trips)	(trips)	(trips)	(trips)	(trips)
1	Single Family Homes	5	29	29		210	296	Single Family Detached Housing	333	25	31	6	19	20	11
2	Senior Luxury Apartments	4	182	165.0		221	332	Peak Hour of Adjacent Street Used	987	61	79	15	47	48	31
3	Ball Courts	4	9	9.0					273	15	38	8	8	19	19
4	Hotel	2	130			310	613	Hotel	1041	60	71	35	24	36	35
5	Restaurant	2			7,500.0	932	1885	High Turnover (sit-down) restaurant	841	75	73	41	34	45	28
6	Restaurant	2			7,500.0	932	1885	High Turnover (sit-down) restaurant	841		73			45	28
7	Dine-in Restaurant	3			7500	932	1865	High Turnover (Sit-Down) Restaurant	841		73			45	28
9	Dine-in Restaurant	3		9,500.0	9500	932	1865	High Turnover (Sit-Down) Restaurant	1,066	94	93	52	42	58	35
8	Retail	3		10,000.0	10000	820	1561	Shopping Center	1,256	157	99	97	60	47	51
8	Dine-in Restaurant	3		5,000.0	5000	932	1865	High Turnover (Sit-Down) Restaurant	561	50	49	27	22	30	19
8	Apartments & Clubhouse	3	275	250.0		220	332	Peak Hour of Adjacent Street Used	2038	125	145	29	96	92	54
11	Grocery	1		63,119.0	63119	850	1645	Peak Hour of Adjacent Street Used	5,687	241	555	145	96	283	272
13	Medical/Retail	1		6,500.0	6500	820	1561	Shopping Center	937	155	72	96	59	35	37
12	Fast food restaurant	1			5500	934	1912	Fast-Food Restaurant with Drive-Through Wind	2,590	221	180	113	108	93	86
15	Sit down Restaurant	1		6,500.0	6500	932	1865	High Turnover (Sit-Down) Restaurant	729		64			39	24
16	Sit down Restaurant	1		6500	6500	932	1865	High Turnover (Sit-Down) Restaurant	729		64			39	24
14	Fast food restaurant	1		706	706	934	1912	Fast-Food Restaurant with Drive-Through Wind	332	28	23	14	14	12	11
	Total								21,084	1,307	1,781	678	629	988	793

Phase 1	11,005	646	957	368	278	502	455
Phase 2	2,723	134	218	76	58	127	91
Phase 3	5,762	426	459	205	220	272	187
Phase 4	1,260	76	116	22	54	67	50
Phase 5	333	25	31	6	19	20	11
Total	21,084	1,307	1,781	678	629	988	793
Phase 4+5 Combined	1,593	102	147	29	73	86	61

Exhibit A

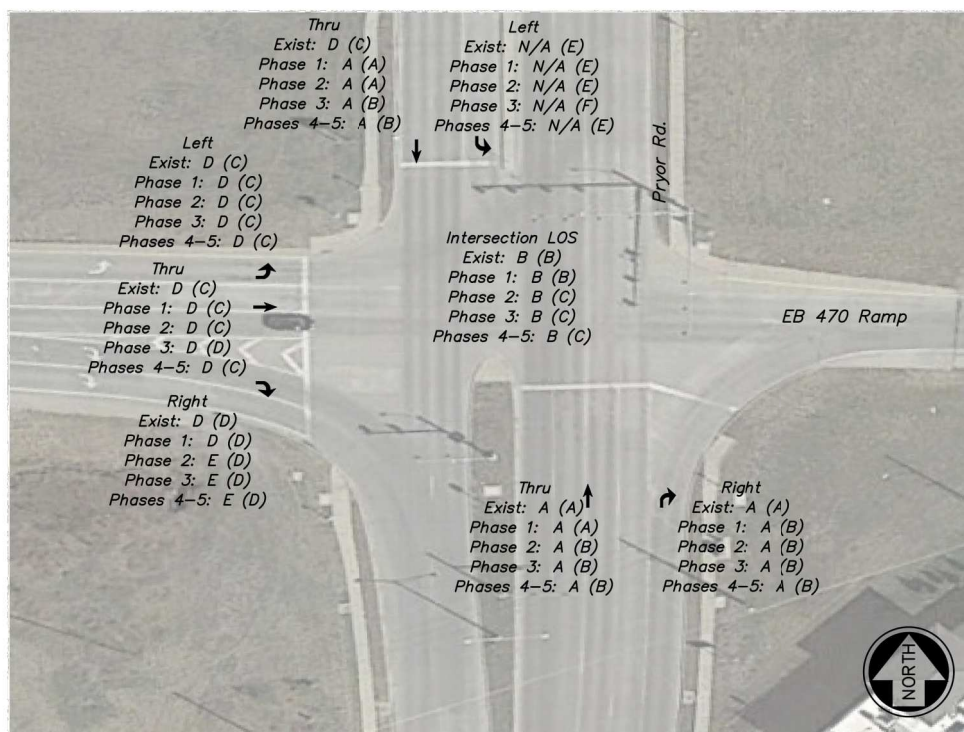


Exhibit E

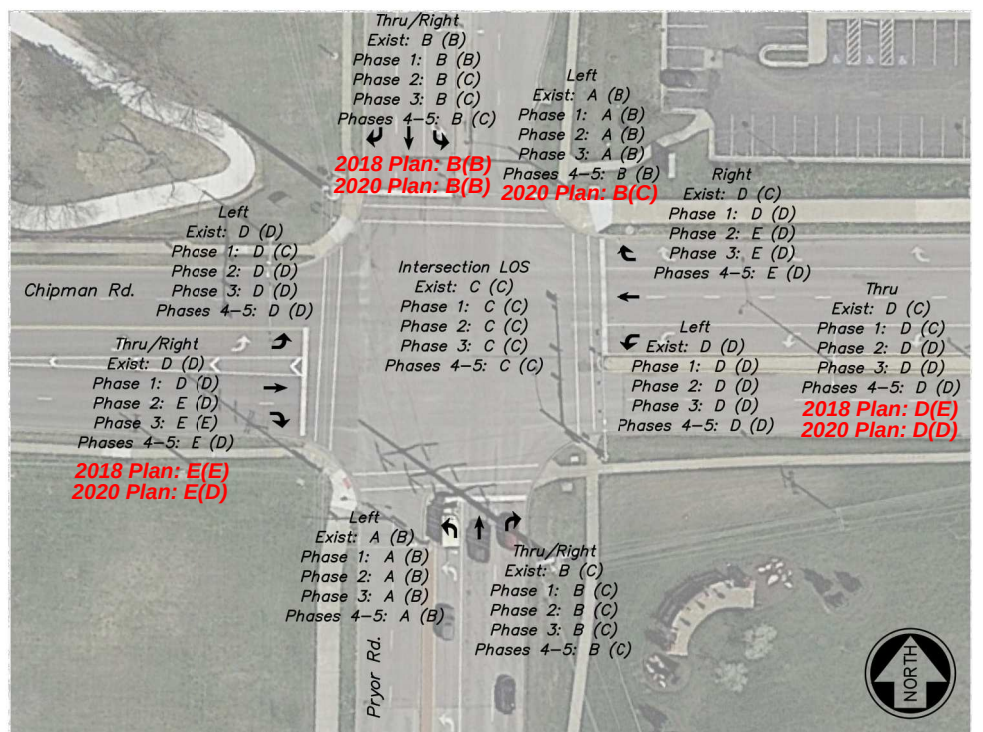


Exhibit B



Exhibit F

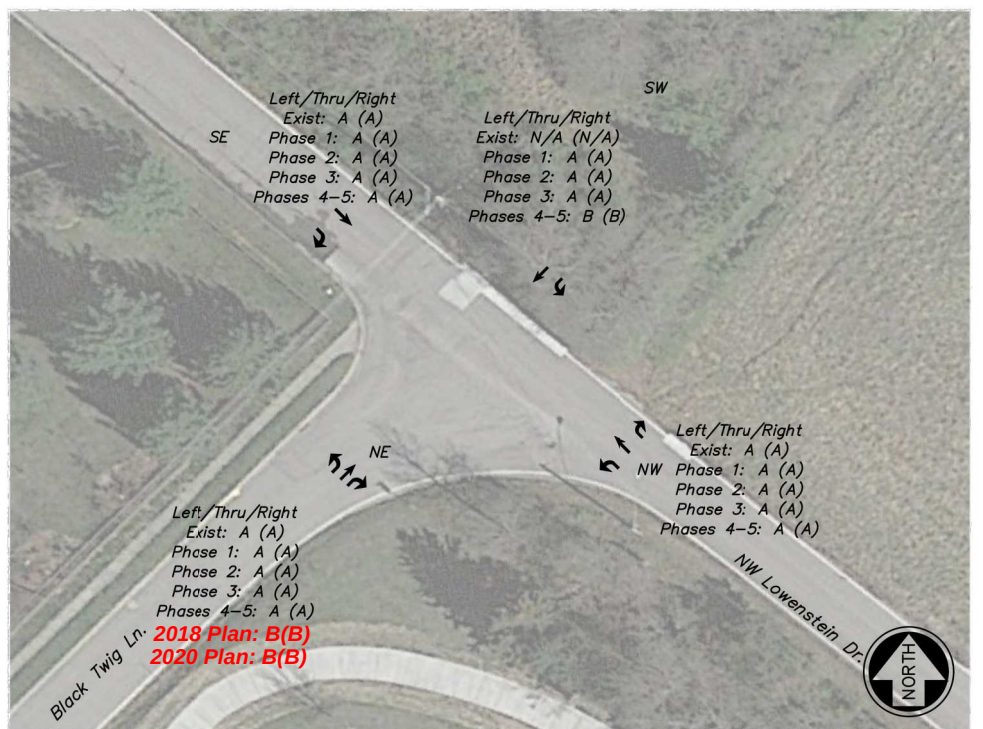


Exhibit C

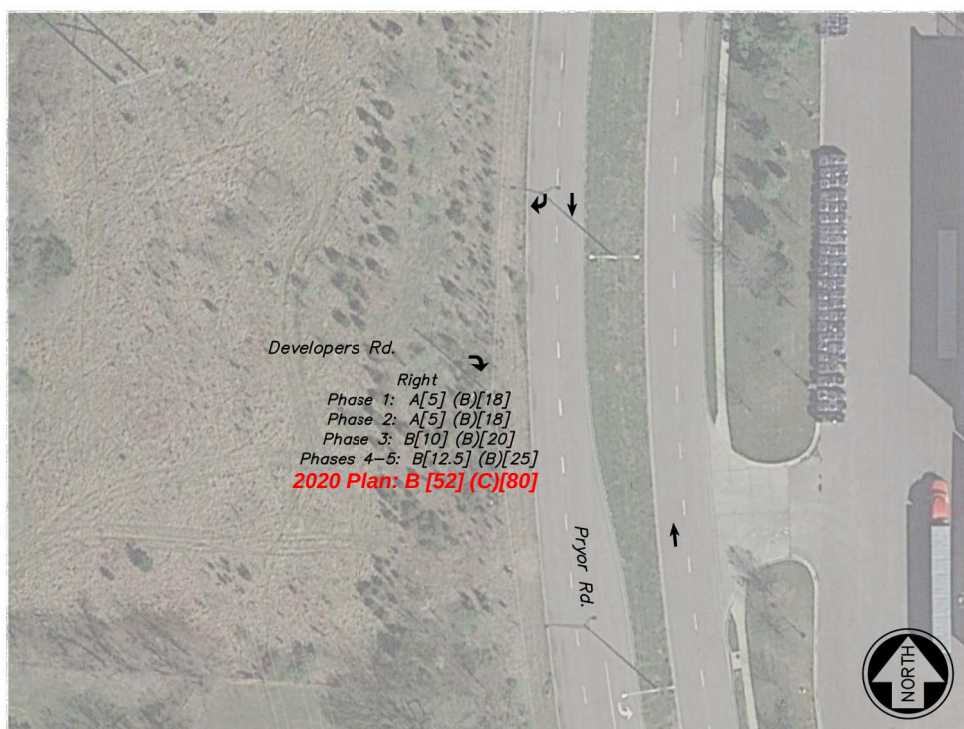


Exhibit G

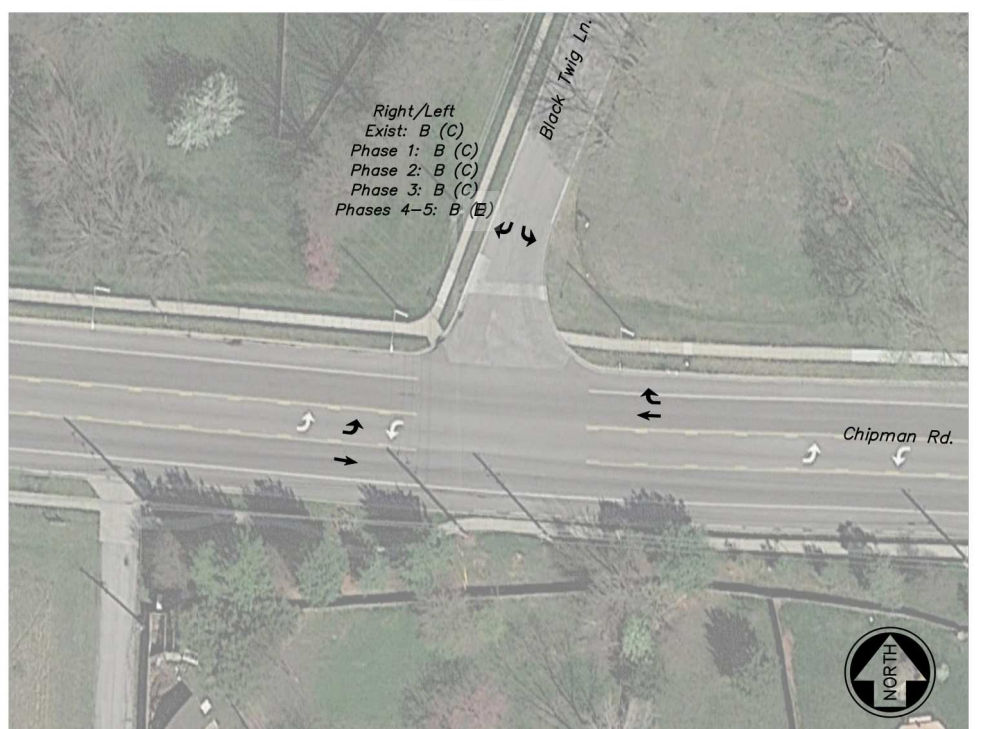
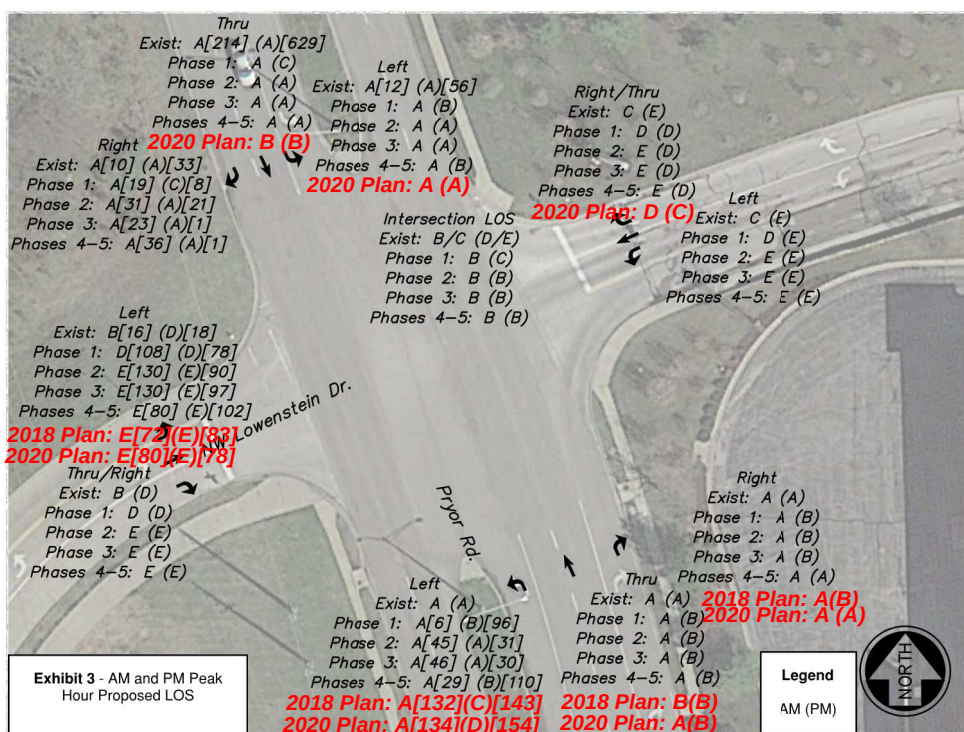
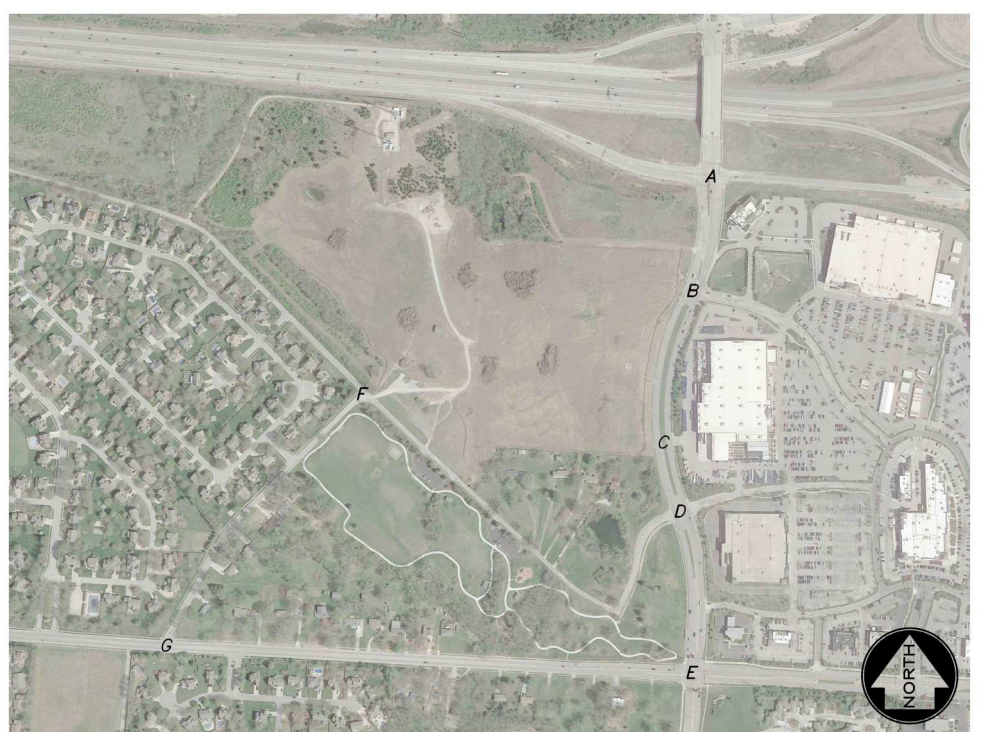
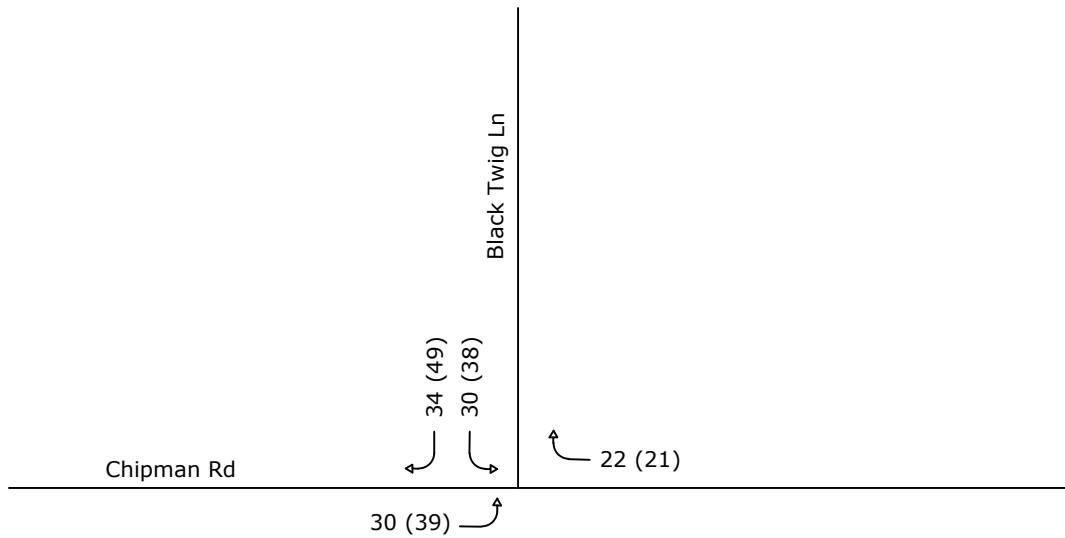
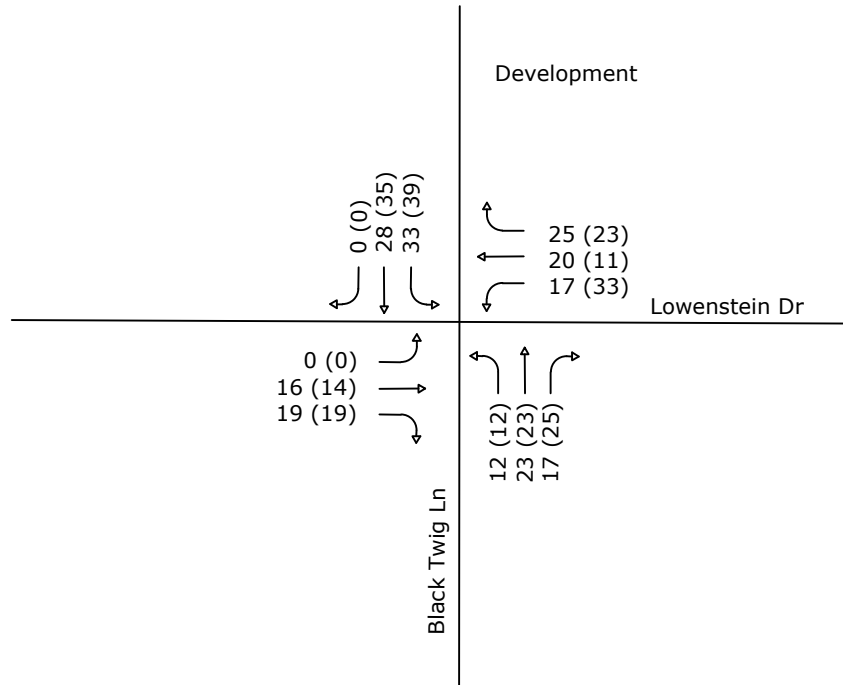


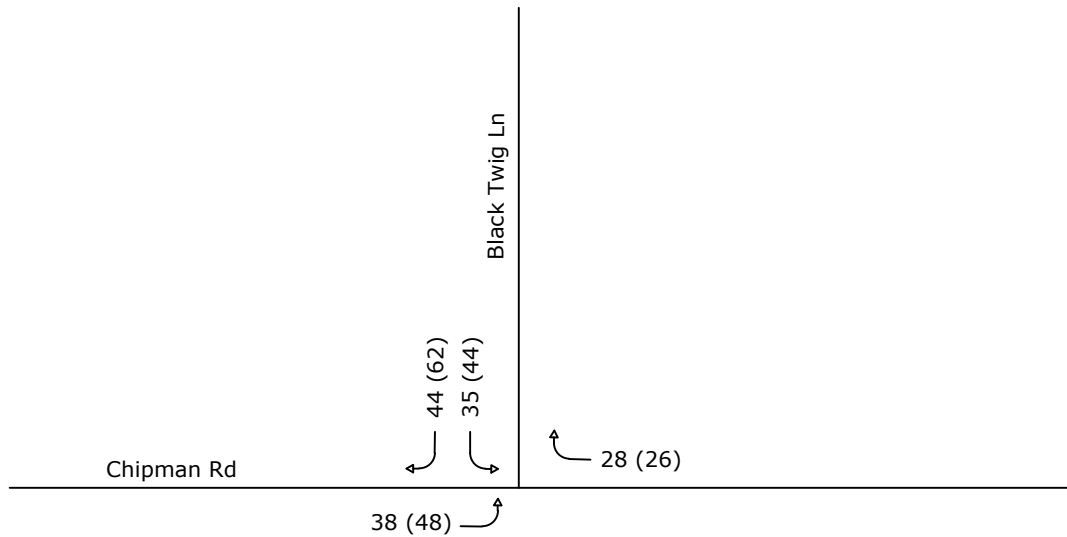
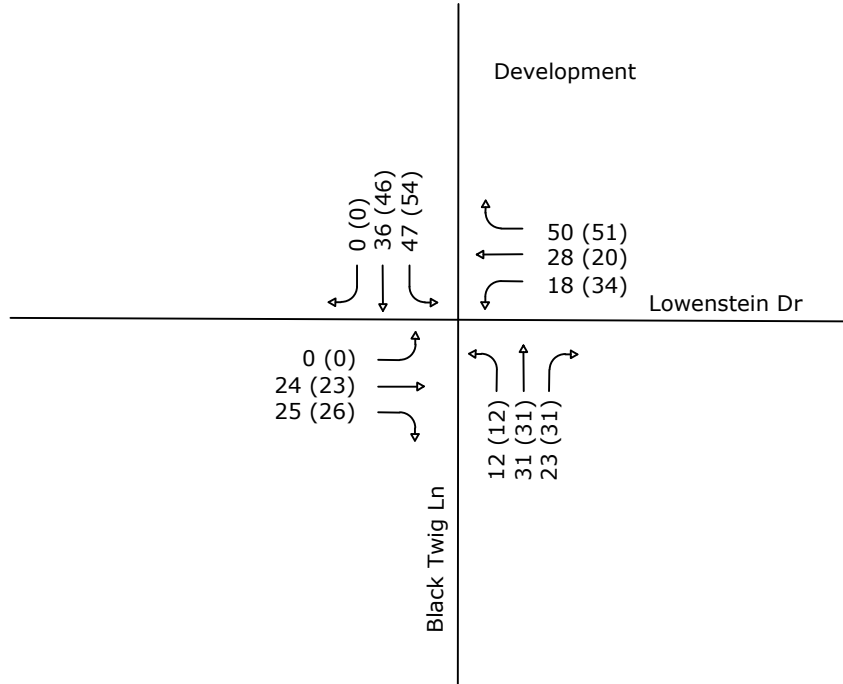
Exhibit D

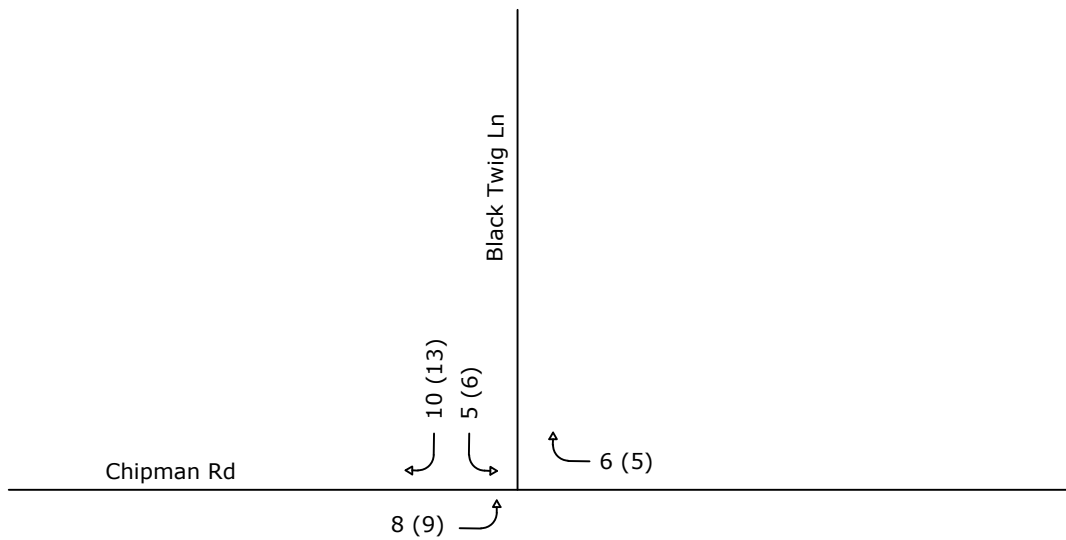
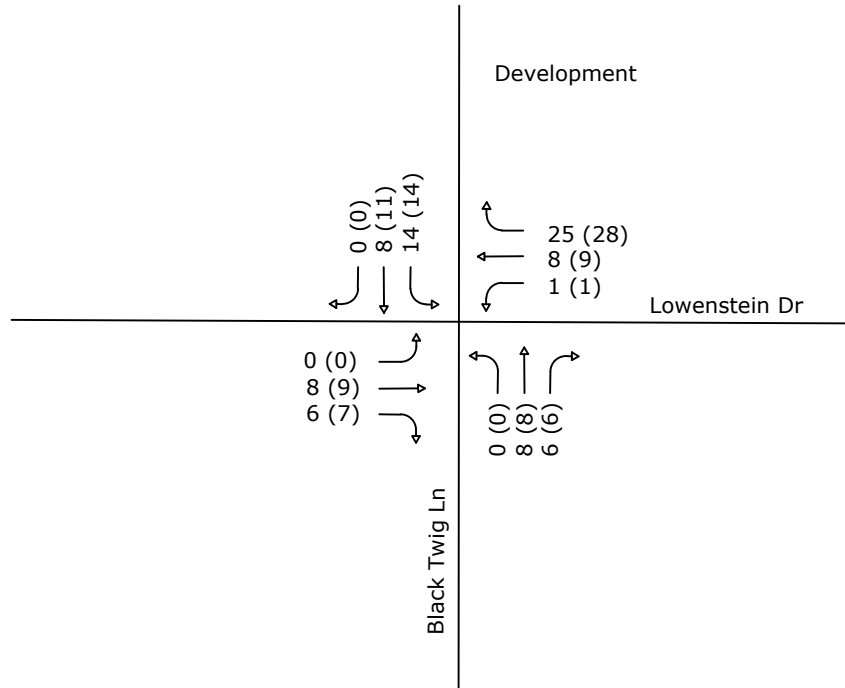


Overall Layout









Phasings

6: W Pryor Rd & I-470 Ramp

2020 Site Plan Update
AM Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	212	408	0	0	0	0	602	513	0	481	0
Future Volume (vph)	14	212	408	0	0	0	0	602	513	0	481	0
Satd. Flow (prot)	1770	3539	2787	0	0	0	0	6408	1583	1863	3539	0
Flt Permitted	0.950											
Satd. Flow (perm)	1770	3539	2787	0	0	0	0	6408	1583	1863	3539	0
Satd. Flow (RTOR)			439						510			
Lane Group Flow (vph)	15	228	439	0	0	0	0	647	552	0	517	0
Turn Type	Prot	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	7	4						2		1	6	
Permitted Phases			4						2			
Total Split (s)	48.0	48.0	48.0					75.5	75.5	11.5	87.0	
Total Lost Time (s)	5.6	5.6	5.6					5.5	5.5	5.5	5.5	
Act Effct Green (s)	11.5	15.8	15.8					108.1	108.1		108.1	
Actuated g/C Ratio	0.09	0.12	0.12					0.80	0.80		0.80	
v/c Ratio	0.10	0.55	0.62					0.13	0.40		0.18	
Control Delay	54.0	60.8	8.5					0.6	0.8		3.6	
Queue Delay	0.0	0.0	0.0					0.0	0.2		0.0	
Total Delay	54.0	60.8	8.5					0.6	1.0		3.6	
LOS	D	E	A					A	A		A	
Approach Delay		27.0						0.8			3.6	
Approach LOS		C						A			A	

Intersection Summary

Cycle Length: 135

Actuated Cycle Length: 135

Offset: 29 (21%), Referenced to phase 2:NBT, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 8.8

Intersection LOS: A

Intersection Capacity Utilization 46.9%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 6: W Pryor Rd & I-470 Ramp



Phasings

9: W Pryor Rd & Summit Crossing

2020 Site Plan Update
AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	215	34	37	2	45	50	88	904	12	84	654	148
Future Volume (vph)	215	34	37	2	45	50	88	904	12	84	654	148
Satd. Flow (prot)	3433	1717	0	1770	1716	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.704			0.318			0.197		
Satd. Flow (perm)	3433	1717	0	1311	1716	0	592	3539	1583	367	3539	1583
Satd. Flow (RTOR)		40			52				162			164
Lane Group Flow (vph)	244	81	0	2	108	0	100	1027	14	95	743	168
Turn Type	Prot	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8			2		2	6		6
Total Split (s)	22.0	43.0		43.0	64.0		13.0	38.0	38.0	11.0	36.0	36.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	5.0	5.0	5.0	5.0	5.0
Act Effct Green (s)	14.2	28.1		16.3	10.3		87.4	79.1	79.1	89.6	80.3	80.3
Actuated g/C Ratio	0.11	0.21		0.12	0.08		0.65	0.59	0.59	0.66	0.59	0.59
v/c Ratio	0.68	0.21		0.01	0.60		0.22	0.50	0.01	0.28	0.35	0.17
Control Delay	67.9	25.3		37.5	46.0		7.1	13.7	0.0	9.5	14.5	2.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.9	25.3		37.5	46.0		7.1	13.7	0.0	9.5	14.5	2.1
LOS	E	C		D	D		A	B	A	A	B	A
Approach Delay		57.3			45.8			13.0			11.9	
Approach LOS		E			D			B			B	

Intersection Summary

Cycle Length: 135

Actuated Cycle Length: 135

Offset: 31 (23%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay: 19.6

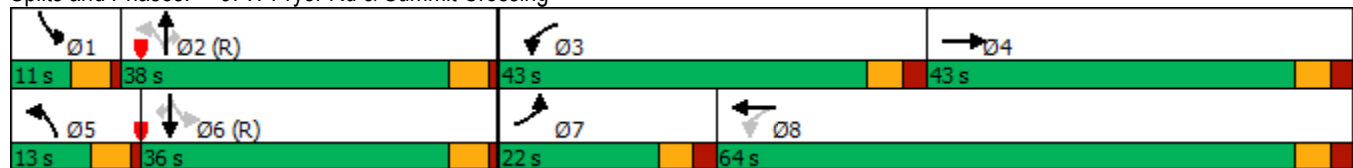
Intersection LOS: B

Intersection Capacity Utilization 56.1%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 9: W Pryor Rd & Summit Crossing



Phasings
11: Lowenstein Rd & W Pryor Rd

2020 Site Plan Update
AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	316	33	81	17	28	12	264	690	27	12	402	176
Future Volume (vph)	316	33	81	17	28	12	264	690	27	12	402	176
Satd. Flow (prot)	3433	1665	0	1770	1781	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.419			0.361		
Satd. Flow (perm)	3433	1665	0	1770	1781	0	780	3539	1583	672	3539	1583
Satd. Flow (RTOR)		90			13				170			222
Lane Group Flow (vph)	351	127	0	19	44	0	293	767	30	13	447	196
Turn Type	Prot	NA		Prot	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases							2		2	6		6
Total Split (s)	29.0	51.5		14.0	36.5		26.0	55.5	55.5	14.0	43.5	43.5
Total Lost Time (s)	6.0	5.5		6.0	5.5		6.5	5.0	5.0	6.5	5.0	5.0
Act Effct Green (s)	18.8	25.1		6.9	8.1		92.4	88.7	88.7	77.5	72.8	72.8
Actuated g/C Ratio	0.14	0.19		0.05	0.06		0.68	0.66	0.66	0.57	0.54	0.54
v/c Ratio	0.73	0.33		0.21	0.37		0.46	0.33	0.03	0.03	0.23	0.21
Control Delay	64.9	18.6		66.5	54.6		5.4	6.1	0.0	8.0	11.2	4.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.9	18.6		66.5	54.6		5.4	6.1	0.0	8.0	11.2	4.2
LOS	E	B		E	D		A	A	A	A	B	A
Approach Delay		52.6			58.2			5.8			9.1	
Approach LOS		D			E			A			A	

Intersection Summary

Cycle Length: 135

Actuated Cycle Length: 135

Offset: 52 (39%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 17.9

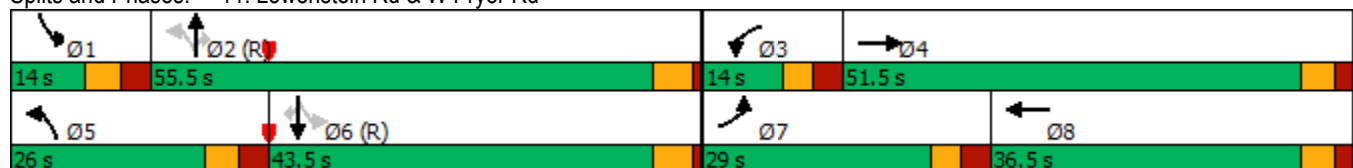
Intersection LOS: B

Intersection Capacity Utilization 55.6%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 11: Lowenstein Rd & W Pryor Rd



Phasings
18: Chipman Rd & W Pryor Rd

2020 Site Plan Update
AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	131	247	83	84	87	89	36	731	127	75	348	75
Future Volume (vph)	131	247	83	84	87	89	36	731	127	75	348	75
Satd. Flow (prot)	1770	3405	0	1770	3539	1583	1770	3461	0	1770	3444	0
Flt Permitted	0.666			0.292			0.476			0.228		
Satd. Flow (perm)	1241	3405	0	544	3539	1583	887	3461	0	425	3444	0
Satd. Flow (RTOR)		32				113		18			25	
Lane Group Flow (vph)	144	362	0	92	96	98	40	943	0	82	464	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2			6		
Total Split (s)	17.0	38.0		17.0	38.0	38.0	13.0	63.0		17.0	67.0	
Total Lost Time (s)	6.0	5.0		6.0	5.0	5.0	6.0	5.0		6.0	5.0	
Act Effct Green (s)	28.2	18.5		26.8	17.8	17.8	82.4	76.7		85.8	80.2	
Actuated g/C Ratio	0.21	0.14		0.20	0.13	0.13	0.61	0.57		0.64	0.59	
v/c Ratio	0.48	0.73		0.46	0.21	0.32	0.07	0.48		0.24	0.23	
Control Delay	46.5	59.6		46.9	51.9	8.9	9.6	18.8		17.8	14.8	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	46.5	59.6		46.9	51.9	8.9	9.6	18.8		17.8	14.8	
LOS	D	E		D	D	A	A	B		B	B	
Approach Delay		55.9			35.5			18.4			15.2	
Approach LOS		E			D			B			B	

Intersection Summary

Cycle Length: 135

Actuated Cycle Length: 135

Offset: 1 (1%), Referenced to phase 2:NBT, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 27.9

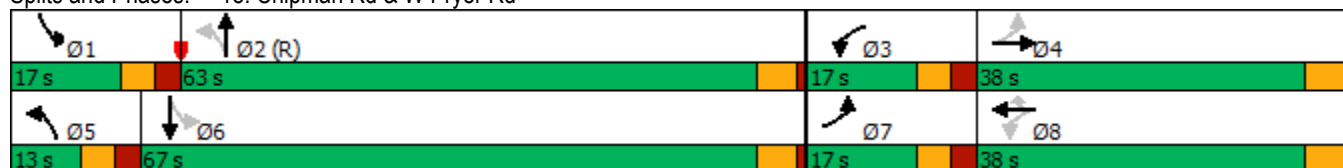
Intersection LOS: C

Intersection Capacity Utilization 61.2%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 18: Chipman Rd & W Pryor Rd



Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↗	↗	↗
Traffic Vol, veh/h	0	137	0	1004	468	252
Future Vol, veh/h	0	137	0	1004	468	252
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	149	0	1091	509	274
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	255	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	744	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	744	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT EBLn1		SBT	SBR		
Capacity (veh/h)	- 744		-	-		
HCM Lane V/C Ratio	- 0.2		-	-		
HCM Control Delay (s)	- 11		-	-		
HCM Lane LOS	- B		-	-		
HCM 95th %tile Q(veh)	- 0.7		-	-		

Intersection												
Int Delay, s/veh	6.3											
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	32	25	21	31	50	12	31	33	47	36	0
Future Vol, veh/h	0	32	25	21	31	50	12	31	33	47	36	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	63	63	63	63	63	63	63	63	63
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	51	40	33	49	79	19	49	52	75	57	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	128	0	0	91	0	0	254	265	71	277	246	89
Stage 1	-	-	-	-	-	-	71	71	-	155	155	-
Stage 2	-	-	-	-	-	-	183	194	-	122	91	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1458	-	-	1504	-	-	699	640	991	675	656	969
Stage 1	-	-	-	-	-	-	939	836	-	847	769	-
Stage 2	-	-	-	-	-	-	819	740	-	882	820	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1458	-	-	1504	-	-	640	625	991	590	640	969
Mov Cap-2 Maneuver	-	-	-	-	-	-	640	625	-	590	640	-
Stage 1	-	-	-	-	-	-	939	836	-	847	751	-
Stage 2	-	-	-	-	-	-	739	722	-	786	820	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0	1.5	10.7	12.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SERSWLn1
Capacity (veh/h)	748	1504	-	-	1458	-	611
HCM Lane V/C Ratio	0.161	0.022	-	-	-	-	0.216
HCM Control Delay (s)	10.7	7.4	0	-	0	-	12.5
HCM Lane LOS	B	A	A	-	A	-	B
HCM 95th %tile Q(veh)	0.6	0.1	-	-	0	-	0.8

Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	45	281	154	31	44	38
Future Vol, veh/h	45	281	154	31	44	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	52	323	177	36	51	44
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	213	0	-	0	622	195
Stage 1	-	-	-	-	195	-
Stage 2	-	-	-	-	427	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1357	-	-	-	450	846
Stage 1	-	-	-	-	838	-
Stage 2	-	-	-	-	658	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1357	-	-	-	433	846
Mov Cap-2 Maneuver	-	-	-	-	433	-
Stage 1	-	-	-	-	806	-
Stage 2	-	-	-	-	658	-
Approach	EB	WB		SB		
HCM Control Delay, s	1.1	0		12.7		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1357	-	-	-	560	
HCM Lane V/C Ratio	0.038	-	-	-	0.168	
HCM Control Delay (s)	7.8	-	-	-	12.7	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.6	

Intersection: 3: W Pryor Rd & Rt-In, Rt-Out

Movement	EB
Directions Served	R
Maximum Queue (ft)	68
Average Queue (ft)	30
95th Queue (ft)	52
Link Distance (ft)	389
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: W Pryor Rd & I-470 Ramp

Movement	EB	EB	EB	EB	EB	NB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	R	T	T	T	T	R	T	T
Maximum Queue (ft)	55	204	164	235	67	76	70	43	43	135	110	187
Average Queue (ft)	15	123	54	93	31	20	15	7	9	47	36	60
95th Queue (ft)	43	190	142	165	55	61	49	28	31	105	87	131
Link Distance (ft)		235	235			172	172	172	172		276	276
Upstream Blk Time (%)		0		1						0		
Queuing Penalty (veh)		0		0						0		
Storage Bay Dist (ft)	200			400	400					311		
Storage Blk Time (%)		0		1						0		
Queuing Penalty (veh)		0		1						0		

Intersection: 9: W Pryor Rd & Summit Crossing

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	TR	L	TR	L	T	T	R	L	T	T
Maximum Queue (ft)	201	236	204	10	143	97	155	226	15	102	168	260
Average Queue (ft)	68	153	51	0	70	39	52	94	1	43	67	134
95th Queue (ft)	175	219	120	5	130	80	115	184	8	84	144	233
Link Distance (ft)			729		280		460	460			208	208
Upstream Blk Time (%)											0	1
Queuing Penalty (veh)											0	4
Storage Bay Dist (ft)	210	210		200		150			150	300		
Storage Blk Time (%)	0	1	0				0	2			0	
Queuing Penalty (veh)	0	1	0				0	0			0	

Intersection: 9: W Pryor Rd & Summit Crossing

Movement	SB	B2
Directions Served	R	T
Maximum Queue (ft)	67	6
Average Queue (ft)	31	0
95th Queue (ft)	59	4
Link Distance (ft)	208	172
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 11: Lowenstein Rd & W Pryor Rd

Movement	EB	EB	EB	B12	WB	WB	NB	NB	NB	NB	B4	B4
Directions Served	L	L	TR	T	L	TR	L	T	T	R	T	T
Maximum Queue (ft)	77	73	142	46	54	86	144	216	191	65	31	30
Average Queue (ft)	43	60	83	3	14	30	79	51	59	4	2	1
95th Queue (ft)	72	80	139	22	43	69	134	147	143	32	21	15
Link Distance (ft)			73	379	162	162		145	145		448	448
Upstream Blk Time (%)	1	9	16				1	1	1	0		
Queuing Penalty (veh)	0	0	18				0	5	3	0		
Storage Bay Dist (ft)	150	150					200			150		
Storage Blk Time (%)	1	9	16				1	1	1	0		
Queuing Penalty (veh)	1	10	49				3	3	0	0		

Intersection: 11: Lowenstein Rd & W Pryor Rd

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	43	145	166	99
Average Queue (ft)	9	52	62	33
95th Queue (ft)	31	120	135	76
Link Distance (ft)		481	481	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	215		450	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 16: Black Twig Rd & Lowenstein Rd

Movement	NW	NE	SW
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	34	61	64
Average Queue (ft)	2	32	31
95th Queue (ft)	15	52	53
Link Distance (ft)	1258	794	150
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 18: Chipman Rd & W Pryor Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	TR	L	T
Maximum Queue (ft)	164	213	221	148	139	79	98	100	303	289	87	115
Average Queue (ft)	87	101	117	59	56	22	38	22	147	143	28	36
95th Queue (ft)	154	166	193	116	109	62	74	65	250	241	66	91
Link Distance (ft)		567	567		777	777			304	304		448
Upstream Blk Time (%)									0	0		
Queuing Penalty (veh)									0	0		
Storage Bay Dist (ft)	200			200			170	170			260	
Storage Blk Time (%)	0	0		0	0				5			
Queuing Penalty (veh)	0	1		0	0				2			

Intersection: 18: Chipman Rd & W Pryor Rd

Movement	SB
Directions Served	TR
Maximum Queue (ft)	138
Average Queue (ft)	54
95th Queue (ft)	115
Link Distance (ft)	448
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 21: Chipman Rd & Black Twig Rd

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	40	69
Average Queue (ft)	7	23
95th Queue (ft)	29	47
Link Distance (ft)	483	556
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 101

Phasings
6: I-470 Ramp

2020 Site Plan Update
PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	132	729	0	0	0	0	585	465	4	874	0
Future Volume (vph)	20	132	729	0	0	0	0	585	465	4	874	0
Satd. Flow (prot)	1770	3539	2787	0	0	0	0	6408	1583	1770	3539	0
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1770	3539	2787	0	0	0	0	6408	1583	1770	3539	0
Satd. Flow (RTOR)			178						489			
Lane Group Flow (vph)	21	139	767	0	0	0	0	616	489	4	920	0
Turn Type	Prot	NA	Perm					NA	Perm	Prot	NA	
Protected Phases	7	4						2		1	6	
Permitted Phases			4						2			
Total Split (s)	53.0	53.0	53.0					54.0	54.0	13.0	67.0	
Total Lost Time (s)	5.6	5.6	5.6					5.5	5.5	5.5	5.5	
Act Effct Green (s)	21.0	35.7	35.7					70.8	70.8	6.1	73.2	
Actuated g/C Ratio	0.18	0.30	0.30					0.59	0.59	0.05	0.61	
v/c Ratio	0.07	0.13	0.80					0.16	0.43	0.04	0.43	
Control Delay	32.6	29.3	35.8					5.5	1.4	55.0	14.2	
Queue Delay	0.0	0.0	0.0					0.0	0.3	0.0	0.0	
Total Delay	32.6	29.3	35.8					5.5	1.7	55.0	14.2	
LOS	C	C	D					A	A	D	B	
Approach Delay		34.8						3.9			14.4	
Approach LOS		C						A			B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 1 (1%), Referenced to phase 2:NBT, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 16.8

Intersection LOS: B

Intersection Capacity Utilization 58.9%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 6: I-470 Ramp

			
Ø1	Ø2 (R)		Ø4
13 s	54 s		53 s
			
Ø6			Ø7
67 s			53 s

Phasings

9: Pryor Rd & Summit Woods Crossing

2020 Site Plan Update
PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	151	32	55	140	55	234	68	659	85	327	1097	190
Future Volume (vph)	151	32	55	140	55	234	68	659	85	327	1097	190
Satd. Flow (prot)	3433	1688	0	1770	1637	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.694			0.230			0.114		
Satd. Flow (perm)	3433	1688	0	1293	1637	0	428	3539	1583	212	3539	1583
Satd. Flow (RTOR)		61			185				182			182
Lane Group Flow (vph)	168	97	0	156	321	0	76	732	94	363	1219	211
Turn Type	Prot	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8			2		2	6		6
Total Split (s)	32.5	63.5		12.0	43.0		11.0	31.5	31.5	13.0	33.5	33.5
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	5.0	5.0	5.0	5.0	5.0
Act Effct Green (s)	11.2	22.0		22.8	16.8		37.8	30.0	30.0	75.0	64.4	64.4
Actuated g/C Ratio	0.09	0.18		0.19	0.14		0.32	0.25	0.25	0.62	0.54	0.54
v/c Ratio	0.53	0.27		0.58	0.83		0.34	0.83	0.18	0.56	0.64	0.23
Control Delay	57.5	17.3		44.4	37.8		19.6	55.7	3.5	28.7	19.3	3.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.5	17.3		44.4	37.8		19.6	55.7	3.5	28.7	19.3	3.1
LOS	E	B		D	D		B	E	A	C	B	A
Approach Delay		42.7			39.9			47.2			19.3	
Approach LOS		D			D			D			B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 112 (93%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 31.3

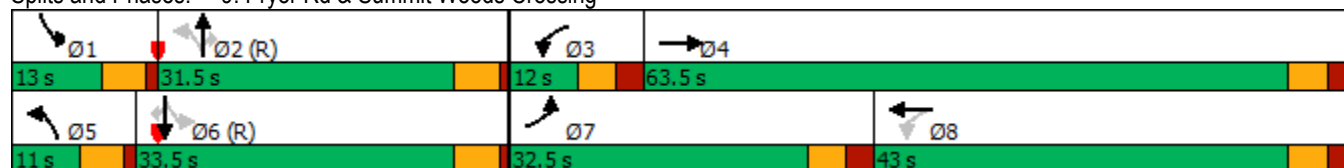
Intersection LOS: C

Intersection Capacity Utilization 77.0%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 9: Pryor Rd & Summit Woods Crossing



Phasings

11: Lowenstein Rd & Pryor Rd

2020 Site Plan Update
PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 			 	 		 	 		 	 	
Traffic Volume (vph)	214	80	175	63	51	34	244	580	42	56	825	193
Future Volume (vph)	214	80	175	63	51	34	244	580	42	56	825	193
Satd. Flow (prot)	3433	1671	0	1770	1751	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.185			0.415		
Satd. Flow (perm)	3433	1671	0	1770	1751	0	345	3539	1583	773	3539	1583
Satd. Flow (RTOR)		92			28				136			195
Lane Group Flow (vph)	230	274	0	68	92	0	262	624	45	60	887	208
Turn Type	Prot	NA		Prot	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases							2		2	6		6
Total Split (s)	16.0	39.5		14.0	37.5		21.0	53.9	53.9	12.6	45.5	45.5
Total Lost Time (s)	6.0	5.5		6.0	5.5		6.5	5.0	5.0	6.5	5.0	5.0
Act Effect Green (s)	10.0	21.5		7.6	16.7		75.3	65.5	65.5	59.7	53.9	53.9
Actuated g/C Ratio	0.08	0.18		0.06	0.14		0.63	0.55	0.55	0.50	0.45	0.45
v/c Ratio	0.80	0.73		0.60	0.34		0.64	0.32	0.05	0.14	0.56	0.25
Control Delay	75.3	42.4		76.9	33.7		35.5	19.0	1.4	8.4	15.9	1.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.3	42.4		76.9	33.7		35.5	19.0	1.4	8.4	15.9	1.4
LOS	E	D		E	C		D	B	A	A	B	A
Approach Delay		57.4			52.0			22.8			12.9	
Approach LOS		E			D			C			B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 115 (96%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 26.7

Intersection LOS: C

Intersection Capacity Utilization 75.0%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 11: Lowenstein Rd & Pryor Rd

 Ø1	 Ø2 (R)	 Ø3	 Ø4
12.6 s	53.9 s	14 s	39.5 s
 Ø5	 Ø6 (R)	 Ø7	 Ø8
21 s	45.5 s	16 s	37.5 s

Phasings
18: Chipman Rd & Pryor Rd

2020 Site Plan Update
PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	221	55	268	206	150	73	625	180	213	745	141
Future Volume (vph)	120	221	55	268	206	150	73	625	180	213	745	141
Satd. Flow (prot)	1770	3423	0	1770	3539	1583	1770	3411	0	1770	3441	0
Flt Permitted	0.616			0.275			0.252			0.199		
Satd. Flow (perm)	1145	3423	0	512	3539	1561	469	3411	0	371	3441	0
Satd. Flow (RTOR)		24				182		32			22	
Lane Group Flow (vph)	126	291	0	282	217	158	77	847	0	224	932	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2			6		
Total Split (s)	12.0	32.0		23.0	43.0	43.0	12.0	42.0		23.0	53.0	
Total Lost Time (s)	6.0	5.0		6.0	5.0	5.0	6.0	5.0		6.0	5.0	
Act Effct Green (s)	19.7	14.7		36.3	25.3	25.3	58.7	51.9		71.5	61.3	
Actuated g/C Ratio	0.16	0.12		0.30	0.21	0.21	0.49	0.43		0.60	0.51	
v/c Ratio	0.58	0.66		0.86	0.29	0.33	0.25	0.57		0.57	0.53	
Control Delay	45.7	53.2		59.7	40.1	5.3	14.2	28.0		30.9	11.8	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	45.7	53.2		59.7	40.1	5.3	14.2	28.0		30.9	11.8	
LOS	D	D		E	D	A	B	C		C	B	
Approach Delay		50.9			40.1			26.8			15.5	
Approach LOS		D			D			C			B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 8 (7%), Referenced to phase 2:NBT, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 28.6

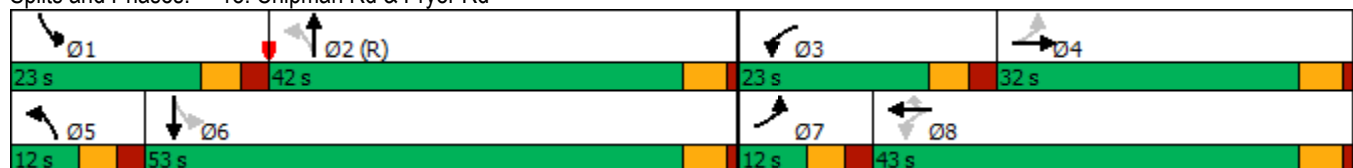
Intersection LOS: C

Intersection Capacity Utilization 77.8%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 18: Chipman Rd & Pryor Rd



Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↗	↗	↗
Traffic Vol, veh/h	0	166	0	817	919	370
Future Vol, veh/h	0	166	0	817	919	370
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	180	0	888	999	402
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	-	500	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	516	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	516	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	15.7	0	0			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR		
Capacity (veh/h)	-	516	-	-		
HCM Lane V/C Ratio	-	0.35	-	-		
HCM Control Delay (s)	-	15.7	-	-		
HCM Lane LOS	-	C	-	-		
HCM 95th %tile Q(veh)	-	1.6	-	-		

Intersection													
Int Delay, s/veh	6.4												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR	
Lane Configurations													
Traffic Vol, veh/h	0	38	26	56	40	51	12	31	41	54	46	0	
Future Vol, veh/h	0	38	26	56	40	51	12	31	41	54	46	0	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	0	42	29	62	44	56	13	34	45	59	51	0	
Major/Minor	Major1			Major2			Minor1			Minor2			
Conflicting Flow All	100	0	0	71	0	0	279	281	57	292	267	72	
Stage 1	-	-	-	-	-	-	57	57	-	196	196	-	
Stage 2	-	-	-	-	-	-	222	224	-	96	71	-	
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22	
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-	
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318	
Pot Cap-1 Maneuver	1493	-	-	1529	-	-	673	627	1009	660	639	990	
Stage 1	-	-	-	-	-	-	955	847	-	806	739	-	
Stage 2	-	-	-	-	-	-	780	718	-	911	836	-	
Platoon blocked, %		-	-		-	-							
Mov Cap-1 Maneuver	1493	-	-	1529	-	-	610	600	1009	583	612	990	
Mov Cap-2 Maneuver	-	-	-	-	-	-	610	600	-	583	612	-	
Stage 1	-	-	-	-	-	-	955	847	-	806	707	-	
Stage 2	-	-	-	-	-	-	693	687	-	835	836	-	
Approach	SE			NW			NE			SW			
HCM Control Delay, s	0			2.8			10.5			12.4			
HCM LOS							B			B			
Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SERSWLn1						
Capacity (veh/h)	750	1529	-	-	1493	-	-	596					
HCM Lane V/C Ratio	0.123	0.04	-	-	-	-	-	0.184					
HCM Control Delay (s)	10.5	7.5	0	-	0	-	-	12.4					
HCM Lane LOS	B	A	A	-	A	-	-	B					
HCM 95th %tile Q(veh)	0.4	0.1	-	-	0	-	-	0.7					

Intersection						
Int Delay, s/veh	6.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	48	280	354	46	58	63
Future Vol, veh/h	48	280	354	46	58	63
Conflicting Peds, #/hr	245	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	51	295	373	48	61	66
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	666	0	-	0	1039	642
Stage 1	-	-	-	-	642	-
Stage 2	-	-	-	-	397	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	923	-	-	-	255	474
Stage 1	-	-	-	-	524	-
Stage 2	-	-	-	-	679	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	735	-	-	-	150	377
Mov Cap-2 Maneuver	-	-	-	-	150	-
Stage 1	-	-	-	-	388	-
Stage 2	-	-	-	-	540	-
Approach	EB	WB		SB		
HCM Control Delay, s	1.5	0		42		
HCM LOS	E					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	735	-	-	-	219	
HCM Lane V/C Ratio	0.069	-	-	-	0.582	
HCM Control Delay (s)	10.3	-	-	-	42	
HCM Lane LOS	B	-	-	-	E	
HCM 95th %tile Q(veh)	0.2	-	-	-	3.2	

Intersection: 3: Pryor Rd & Rt-In, Rt-Out

Movement	EB	SB	SB
Directions Served	R	T	T
Maximum Queue (ft)	103	20	34
Average Queue (ft)	44	1	2
95th Queue (ft)	80	18	28
Link Distance (ft)	451	457	457
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			0
Queuing Penalty (veh)			0

Intersection: 6: I-470 Ramp

Movement	EB	EB	EB	EB	EB	NB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	R	T	T	T	T	R	L	T
Maximum Queue (ft)	61	150	107	261	253	71	63	84	121	120	34	265
Average Queue (ft)	22	68	12	166	146	8	12	22	44	39	3	137
95th Queue (ft)	53	126	54	266	248	40	44	61	94	85	19	253
Link Distance (ft)		241	241			175	175	175	175			276
Upstream Blk Time (%)				5	5					0		0
Queuing Penalty (veh)				0	0					0		0
Storage Bay Dist (ft)	200			400	400					311	550	
Storage Blk Time (%)		0		5	5					0		0
Queuing Penalty (veh)		0		4	3					0		0

Intersection: 6: I-470 Ramp

Movement	SB
Directions Served	T
Maximum Queue (ft)	269
Average Queue (ft)	138
95th Queue (ft)	254
Link Distance (ft)	276
Upstream Blk Time (%)	1
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 9: Pryor Rd & Summit Woods Crossing

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	TR	L	TR	L	T	T	R	L	T	T
Maximum Queue (ft)	153	197	153	230	295	114	344	410	200	216	310	315
Average Queue (ft)	24	118	58	89	147	38	140	213	61	169	217	244
95th Queue (ft)	102	178	114	171	257	96	279	369	194	251	351	356
Link Distance (ft)			523		280		457	457			216	216
Upstream Blk Time (%)					2			0		4	14	20
Queuing Penalty (veh)					0			0		0	111	161
Storage Bay Dist (ft)	210	210		150		150			150	300		
Storage Blk Time (%)		0		2	11		8	23	0	4	14	29
Queuing Penalty (veh)		0		6	15		6	19	0	24	45	55

Intersection: 9: Pryor Rd & Summit Woods Crossing

Movement	SB	B2	B2
Directions Served	R	T	T
Maximum Queue (ft)	200	222	248
Average Queue (ft)	108	68	85
95th Queue (ft)	244	214	233
Link Distance (ft)		175	175
Upstream Blk Time (%)	0	4	5
Queuing Penalty (veh)	0	31	39
Storage Bay Dist (ft)	150		
Storage Blk Time (%)	0		
Queuing Penalty (veh)	0		

Intersection: 11: Lowenstein Rd & Pryor Rd

Movement	EB	EB	EB	B12	WB	WB	NB	NB	NB	NB	B4	B4
Directions Served	L	L	TR	T	L	TR	L	T	T	R	T	T
Maximum Queue (ft)	66	75	145	100	134	138	145	216	224	145	126	131
Average Queue (ft)	41	61	104	13	55	55	104	99	112	16	9	8
95th Queue (ft)	66	78	156	56	113	108	154	207	209	74	77	67
Link Distance (ft)			71	423	162	162		145	145		447	447
Upstream Blk Time (%)	1	16	36		1	0	4	7	7	0		
Queuing Penalty (veh)	0	0	47		0	0	0	30	30	0		
Storage Bay Dist (ft)	150	150					200			150		
Storage Blk Time (%)	1	16	36				4	7	7	0		
Queuing Penalty (veh)	1	41	76				12	16	3	0		

Intersection: 11: Lowenstein Rd & Pryor Rd

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	164	345	379	215
Average Queue (ft)	31	138	147	54
95th Queue (ft)	92	278	289	147
Link Distance (ft)		481	481	
Upstream Blk Time (%)		0	0	
Queuing Penalty (veh)		1	1	
Storage Bay Dist (ft)	215			150
Storage Blk Time (%)		2	6	
Queuing Penalty (veh)		1	11	

Intersection: 16: Black Twig Ln & Lowenstein Rd

Movement	SE	NW	NE	SW
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	4	40	57	75
Average Queue (ft)	0	6	32	37
95th Queue (ft)	3	27	50	59
Link Distance (ft)	835	1205	836	331
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 18: Chipman Rd & Pryor Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	TR	L	T
Maximum Queue (ft)	159	177	208	276	155	140	122	214	319	319	197	215
Average Queue (ft)	77	86	98	149	75	53	48	51	197	217	80	84
95th Queue (ft)	135	142	167	240	136	113	87	132	301	336	162	169
Link Distance (ft)		524	524		784	784			304	304		447
Upstream Blk Time (%)									1	2		
Queuing Penalty (veh)									0	0		
Storage Bay Dist (ft)	200			200			170	170			260	
Storage Blk Time (%)		0		4	0	0			10		0	0
Queuing Penalty (veh)		0		4	0	0			7		0	0

Intersection: 18: Chipman Rd & Pryor Rd

Movement	SB	B4
Directions Served	TR	T
Maximum Queue (ft)	233	8
Average Queue (ft)	115	0
95th Queue (ft)	205	6
Link Distance (ft)	447	145
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 22: Chipman Rd & Black Twig Rd

Movement	EB	WB	SB
Directions Served	L	TR	LR
Maximum Queue (ft)	48	42	81
Average Queue (ft)	16	2	36
95th Queue (ft)	43	18	69
Link Distance (ft)	356	1735	531
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 803