MCCLURE™

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.

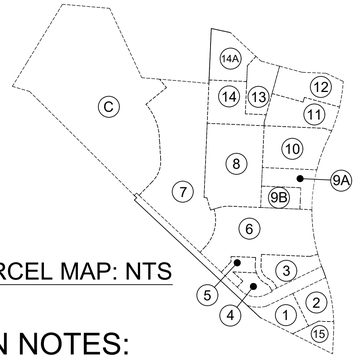
Traffic volumes at the intersection of Black Twig Lane and Chipman Road were checked against criteria for consideration of traffic signal installation. The intersection would not meet signal

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

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)

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 (PARCEL145,724 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

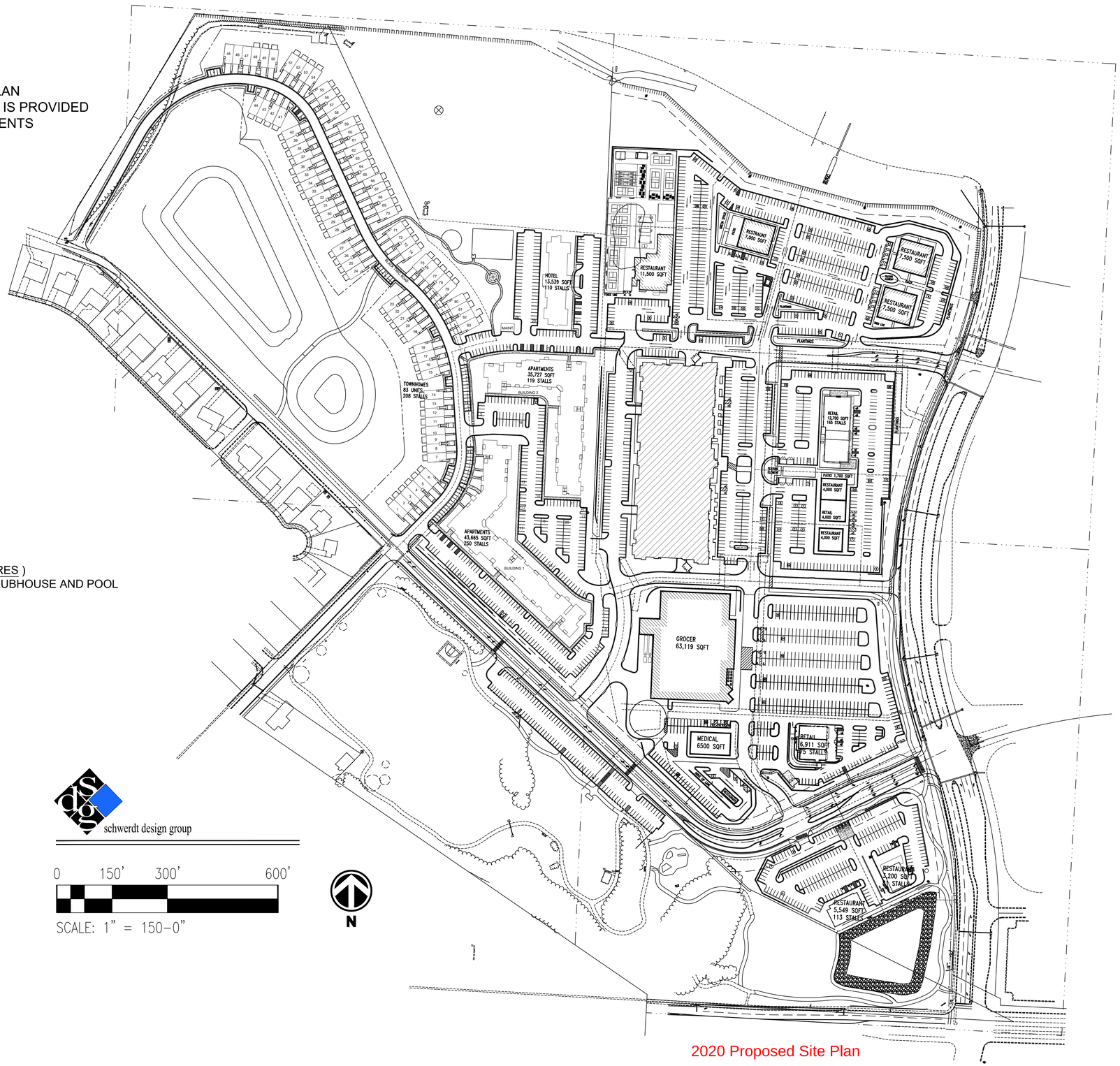
PARCEL 13: RESTAURANT (PARCEL 81,134 SQFT = 1.86 ACRES)
- 7,000 SQFT RESTAURANT WITH SURFACE PARKING

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

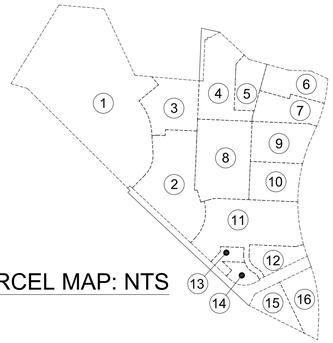


schwerdt design group

0 150' 300' 600'

SCALE: 1" = 150-0"

2020 Proposed Site Plan



PARCEL MAP: NTS

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)

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 (PARCEL145,738 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 (PARCEL119,926 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

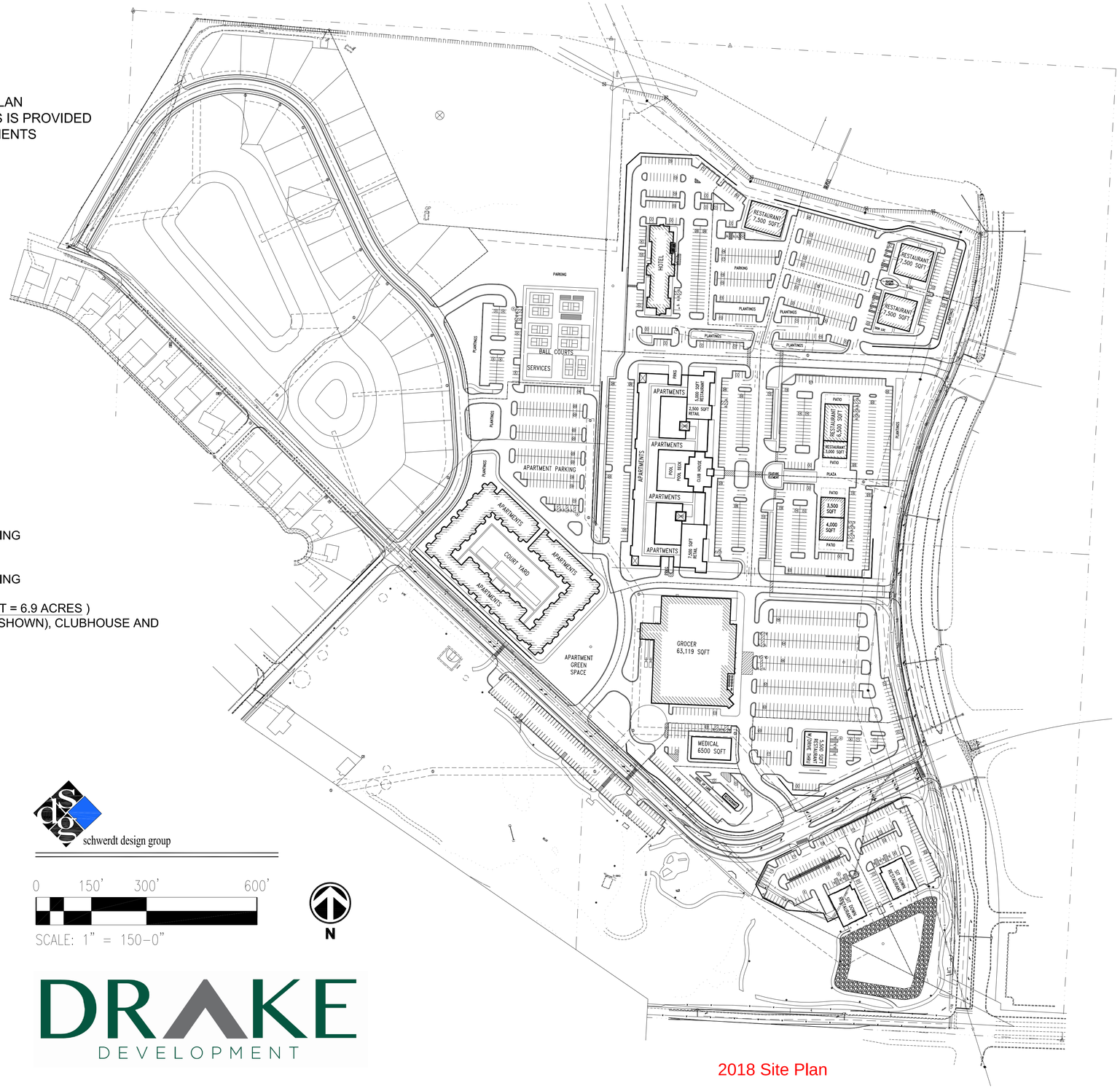
PARCEL 12: RESTAURANT (PARCEL 76,395 SQFT = 1.8 ACRES)
5,500 SQFT RESTAURANT WITH DRIVE THRU AND SURFACE PARKING

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



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DRAKE DEVELOPMENT

2018 Site Plan

Trip Generation - 10th Edition - October 2020

							Trip Ends						
Parcel	**Building Use**	**Phase 1 or 2**	**Dwelling Units**	**Building Size Sq Ft**	**ITE Land Use Code**	**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	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 Windo	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 Windo	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

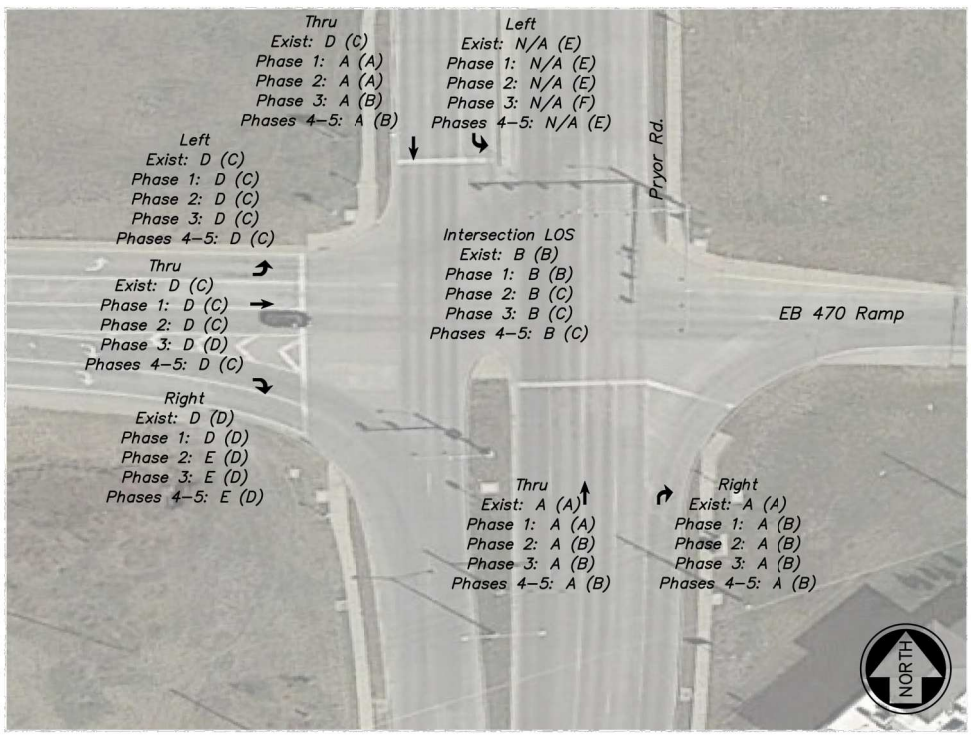


Exhibit B

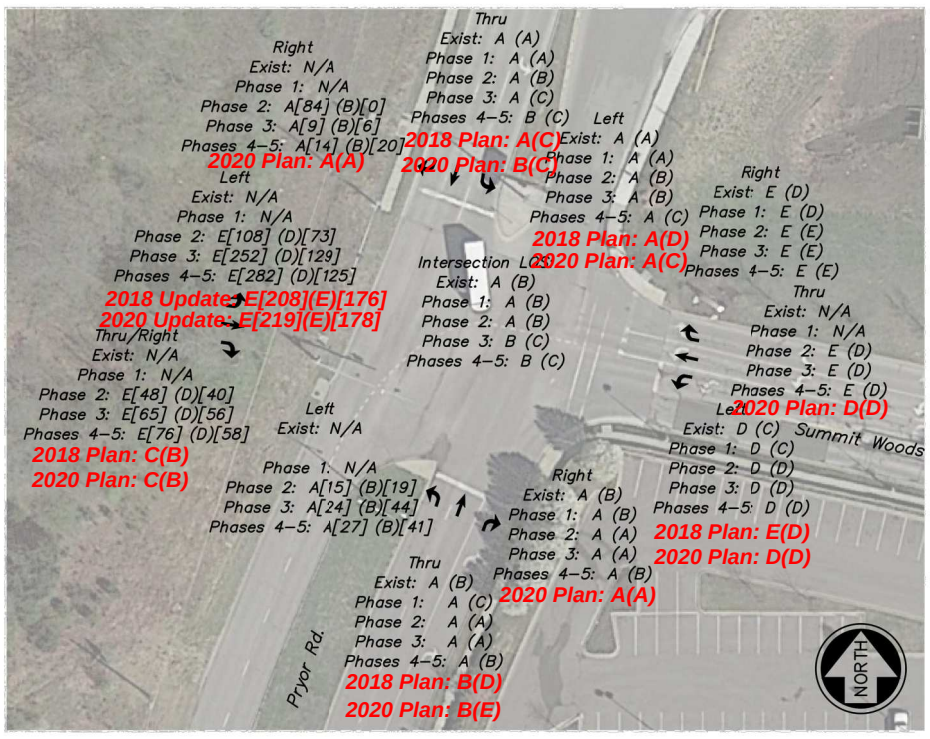


Exhibit C

Exhibit D

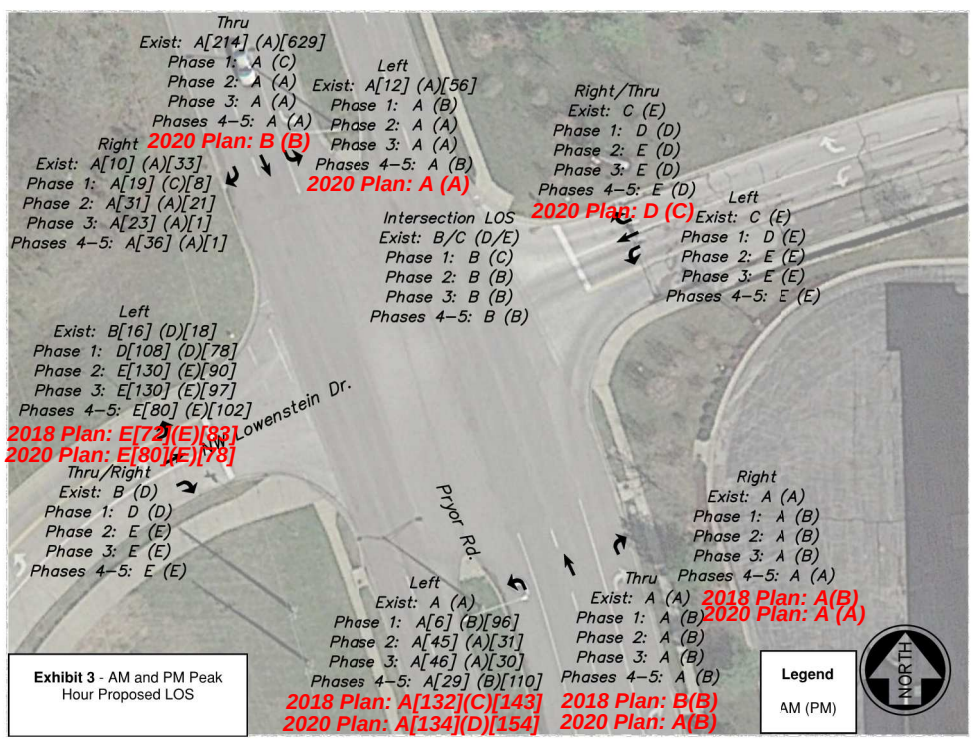


Exhibit E

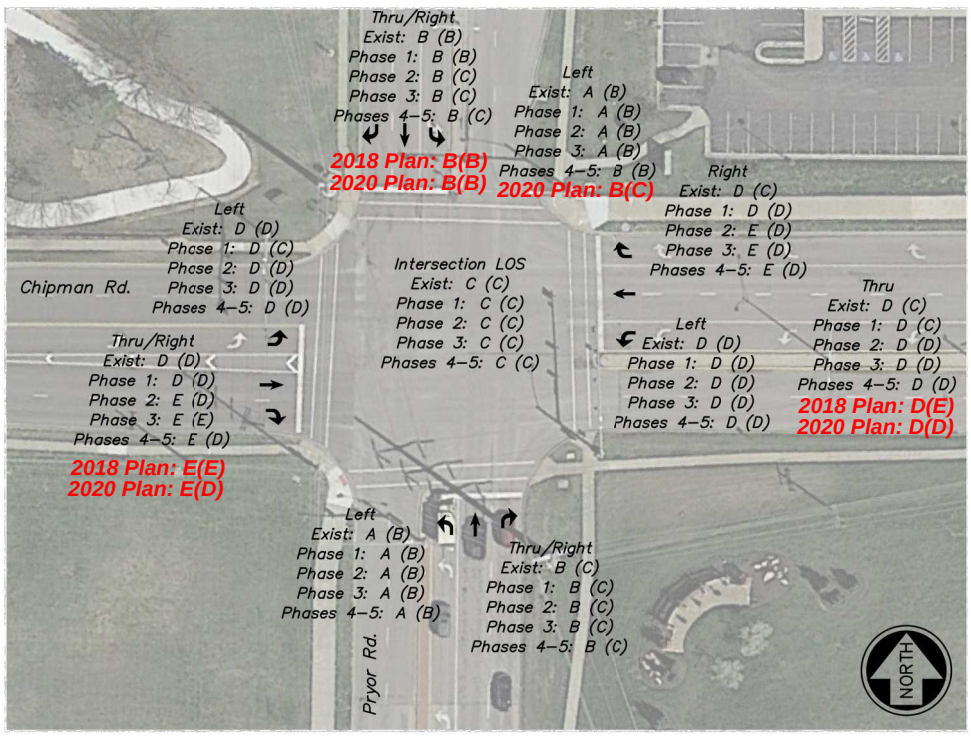


Exhibit F

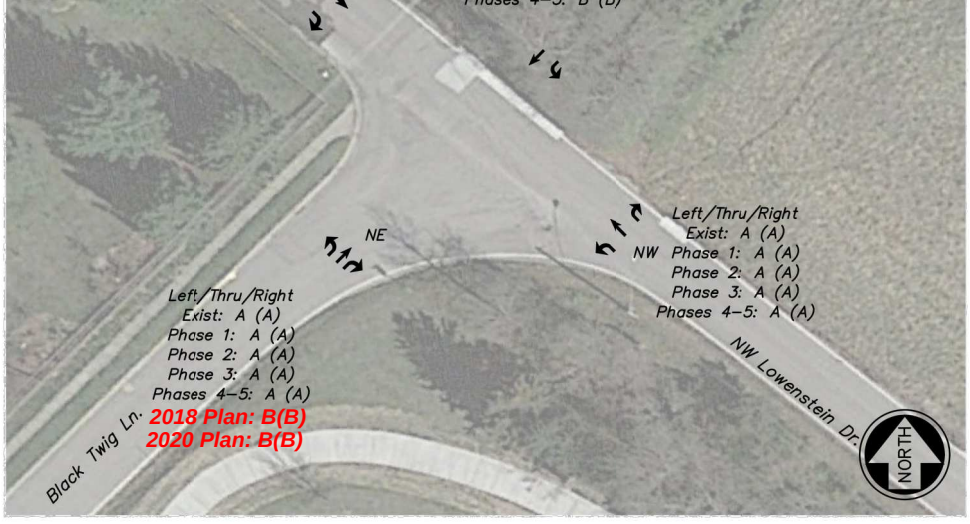
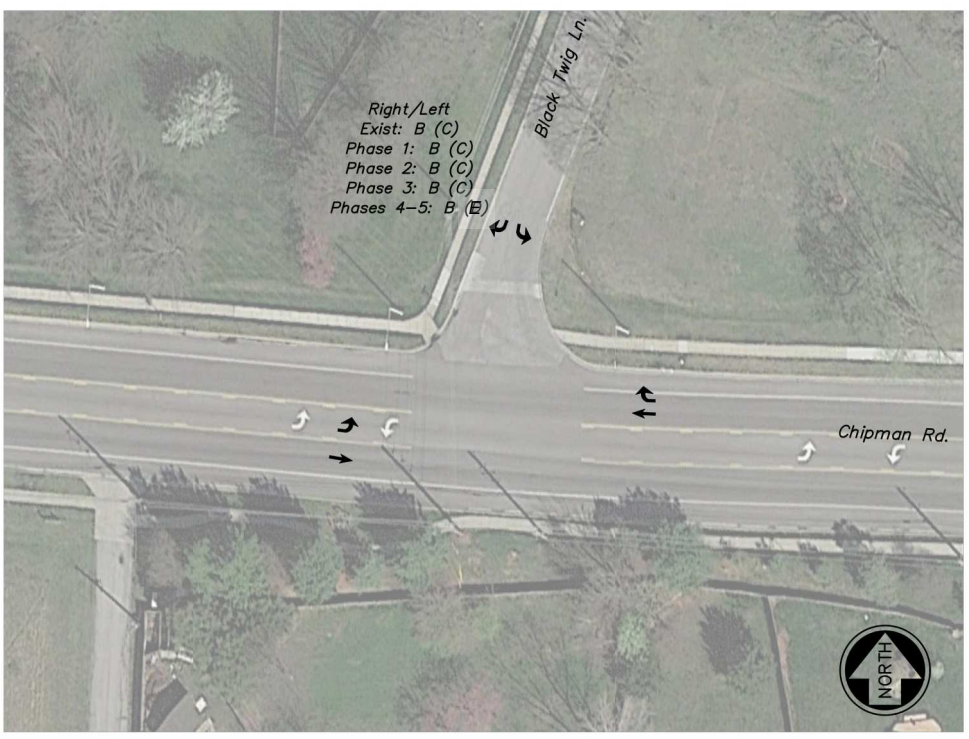
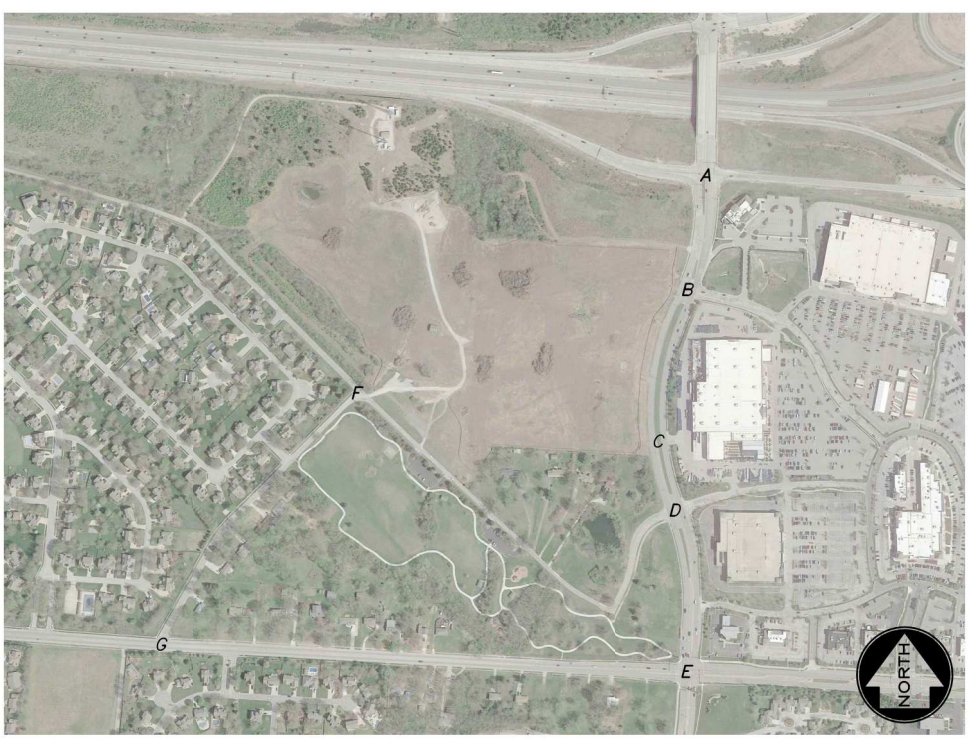
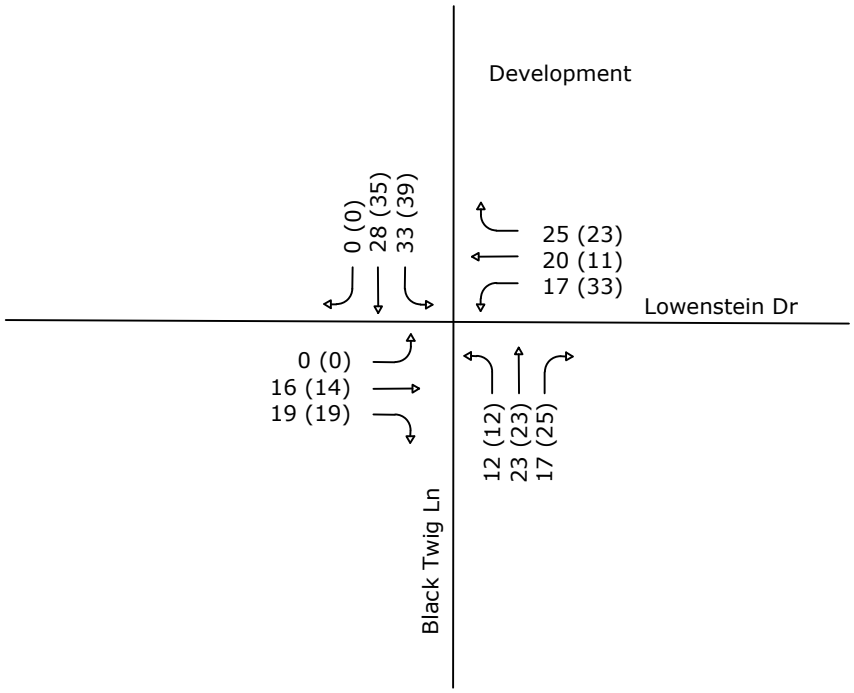


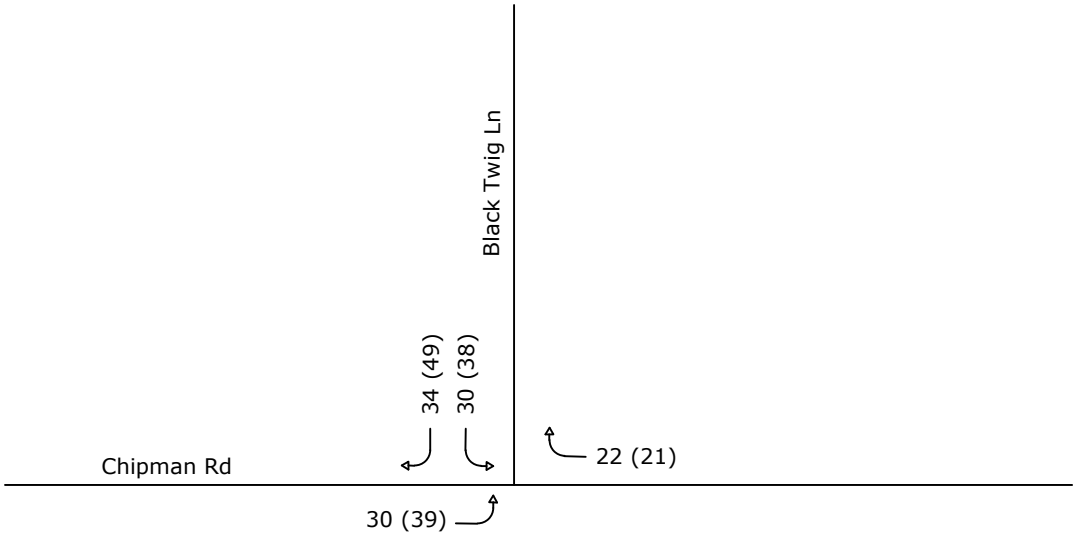
Exhibit G



Overall Layout





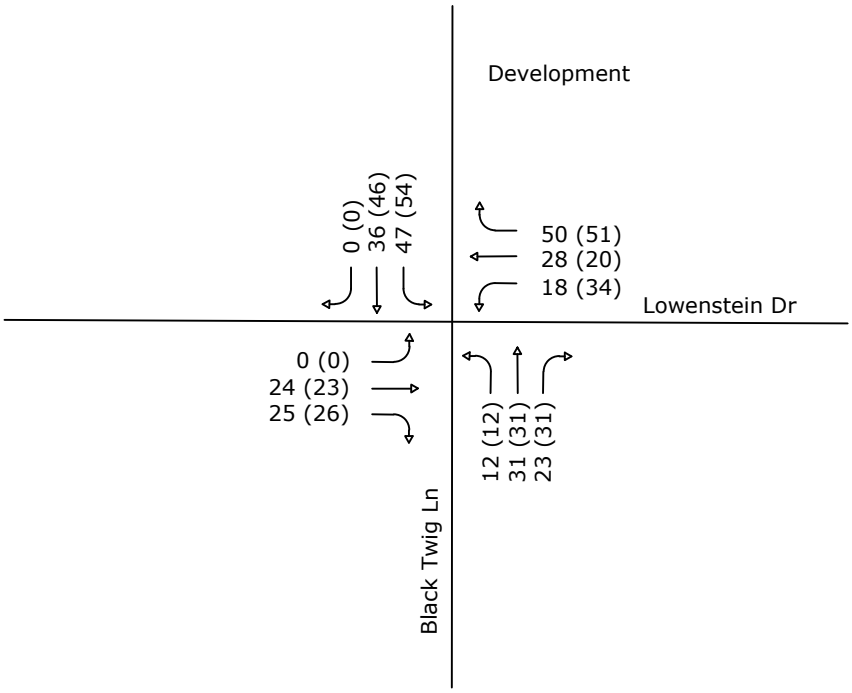


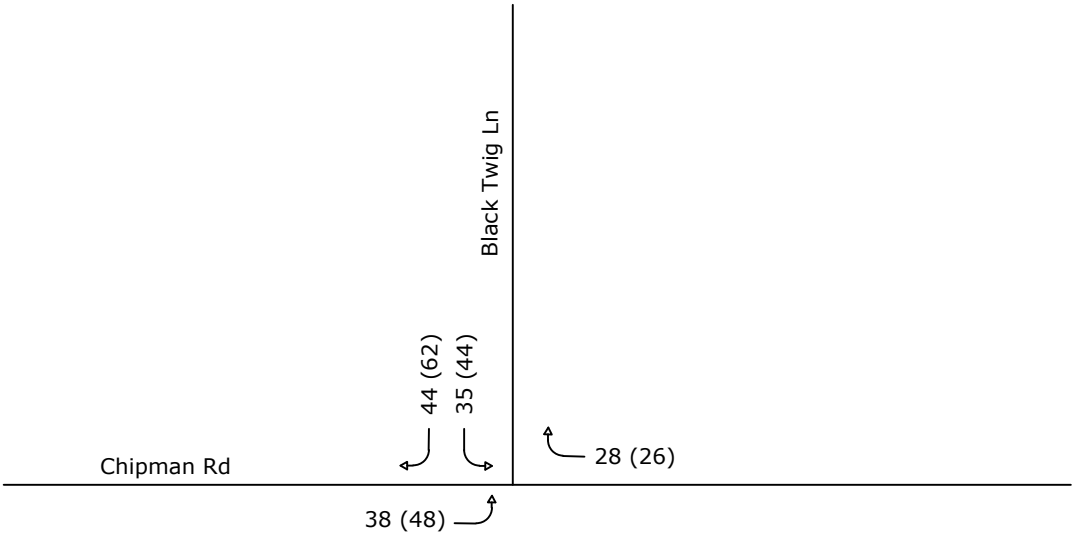
McCLURE™
building strong communities.

2018 Trip Distribution
Development Trips AM(PM)
Black Twig Lane
Lee's Summit, MO

NORTH

FIGURE 4



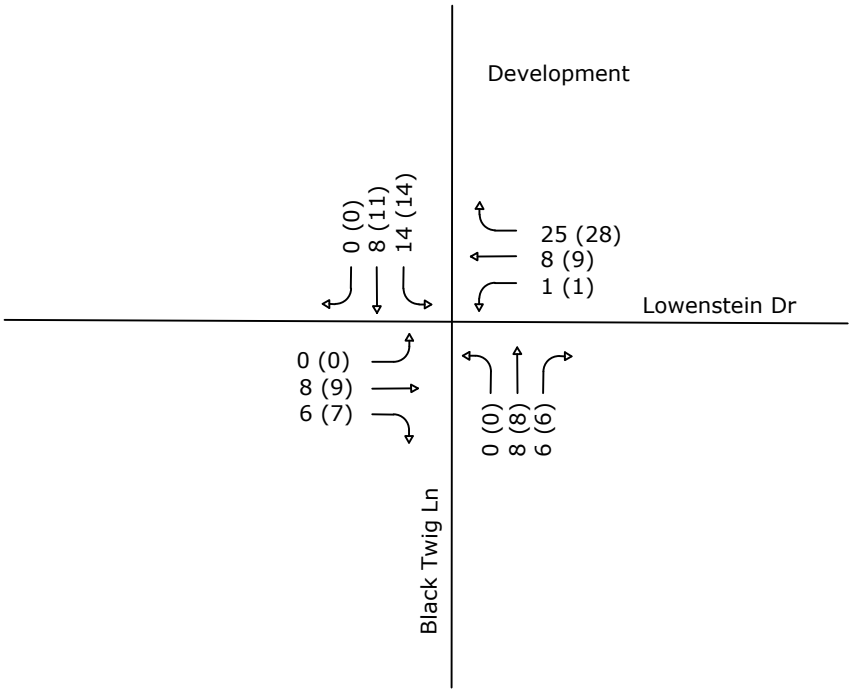


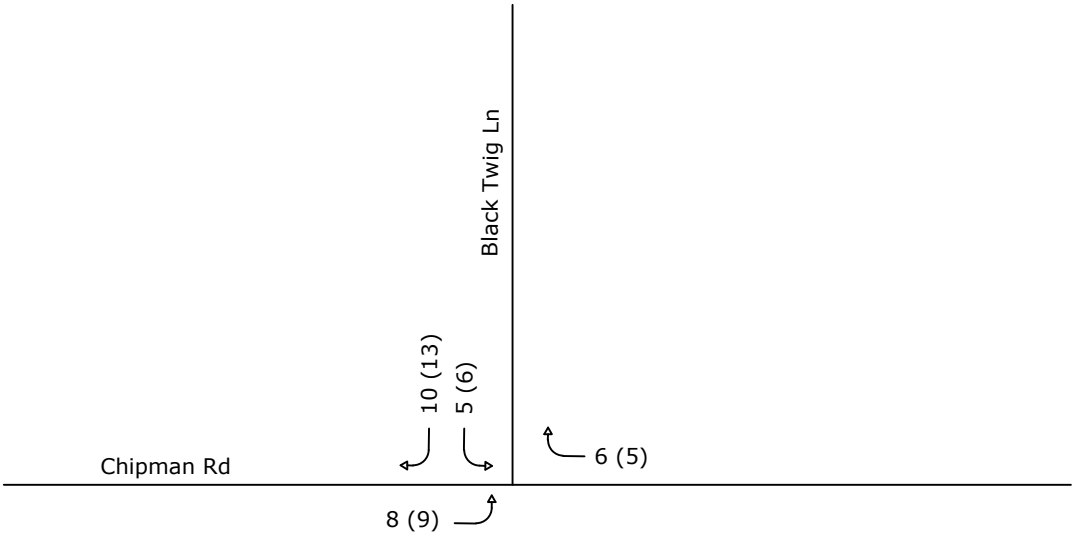
McCLURE™
building strong communities.

2020 Trip Distribution
Development Trips AM(PM)
Black Twig Lane
Lee's Summit, MO

NORTH

FIGURE 5





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Increase in Trips from 2018 to 2020
Development Trips AM(PM)
Black Twig Lane
Lee's Summit, MO

NORTH

FIGURE 6