



## MEMO

DATE **10/5/2018**  
 TIME **2:00 PM**  
 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 Paul Parks Jr., P.E.

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



MEC completed additional analysis comparing the trips generated by the previous site plan, included on the most recently submitted Traffic Impact Study (TIS) on August 10, 2018 with the new proposed site plan. Both site plans are attached to this memo for reference. The largest changes between the site plans is the removal of the Extended Stay Hotel, fewer single family homes, and additional restaurants and retail space near the apartments and in place of the hotel.

The trips for the original site study were generated using data from the data compiled by the Institute of Transportation Engineers (ITE) in their report Trip Generation Manual, 9<sup>th</sup> Edition. The updated site uses the data from the recently released Trip Generation Manual, 10<sup>th</sup> 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 minimal. There is a 9% overall increase in daily trips generated, a decrease of 2% of trips during the morning peak hour, and an increase of 2% 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
<b>Original Study Site</b>	19,334	1,339	1,741	655	684	968	773
<b>New Site Plan</b>	21,084	1,307	1,781	678	629	988	793
<b>Difference between Original and New Site Plan</b>	1,750	-32	40	23	-55	20	20

While the trips generated closely match the numbers in the previous study, an analysis of the impact of these additional trips were completed to ensure that the previous recommendations are still appropriate. Table 2 below shows the existing levels of service (LOS) as well as the LOS for the complete development (final design) for both the original site plan from the August 10, 2018,

study as well as the LOS for the new site plan. The updated traffic volumes based on the new site plan were input into the proposed Synchro files. The signal timings were not adjusted for a direct comparison as to how the traffic volumes are impacted. As expected, the LOS does not change between the original and new 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." Black Twig Lane and Chipman Road, an unsignalized intersection, does still have a LOS B during the peak evening hours.

*Table 2 - Existing and Final Development LOS Comparison*

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

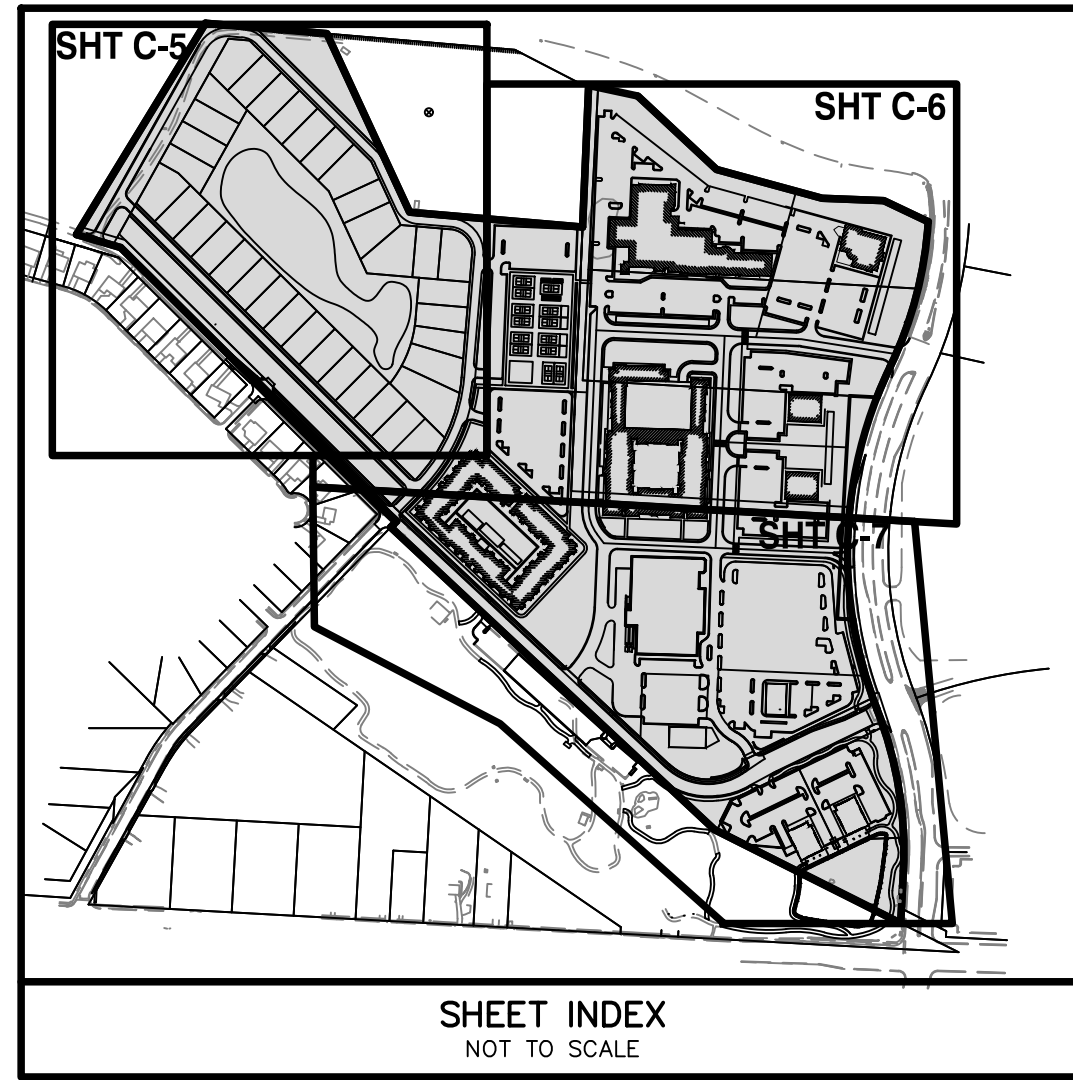
When considering the movement LOS, there are more slight changes. Exhibit 3 from the previous report is attached to this memo with the movement LOS for the final development included in red for comparison. This exhibit also shows a change in expected 95%-ile queue lengths when the change in length is over 25 feet. While there are slight changes in some, overall, the movement LOS remain the same. Also, it is important to note, that the priority is given to the Pryor Road corridor over the intersecting side roads giving access to the development. Adjustment in signal timings can provide 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.

As the LOS are expected to stay at acceptable levels, the previous study's recommendations will remain unchanged. These have been copied below for easy reference:

- For phase one of the development, install a traffic signal at the intersection of Lowenstein and Pryor Roads and improve the intersection as shown in the site plan with a continuous right turn lane for southbound vehicles. This will improve the function of the intersection with the expected increase in traffic. The developer's proposed length for two eastbound left turn lanes 150 feet long with a 100 foot long taper will be adequate. The existing northbound left turn lane onto Lowenstein Drive is also adequate.
- For phase one, construct the proposed 150 feet long right-turn only lane with a 100 feet long taper at the proposed right-in, right-out access point, as shown in the site plan.

- For phase one, add a 150 feet long right-turn lane with a 100 foot long taper on Lowenstein Drive at the eastern development access point to the grocery store, as shown in the site plan.
- For phase two, upgrade the existing signal at Summit Woods Crossing to accommodate a fourth leg for the intersection and the increase in traffic.
- For phase two, add a 150 ft long right-turn only lane with a 100 ft long taper on southbound Pryor Road and a 200 ft long left-turn only lane with a 100 ft long taper on northbound Pryor Road.
- For phase two, have a three lane section on the fourth (west) leg of the Summit Woods Crossing intersection, with one left turn lane with a minimum length of 300 ft long with a taper (or two left-turn lanes of 150'), one through/right turn lane and one through lane for westbound vehicles to enter.
- Improve Lowenstein Drive and Black Twig Lane to City standards.





**FIRE DEPARTMENT NOTES:**

- IFC 507.5.1- WHERE A PORTION OF THE FACILITY OR BUILDING HEREAFTER CONSTRUCTED OR MOVED INTO OR WITHIN THE JURISDICTION IS MORE THAN 300 FEET FROM A HYDRANT ON A FIRE APPARATUS ACCESS ROAD, AS MEASURED BY AN APPROVED ROUTE AROUND THE EXTERIOR OF THE FACILITY OR BUILDING, ON-SITE FIRE HYDRANTS AND MAINS SHALL BE PROVIDED WHERE REQUIRED BY THE FIRE CODE OFFICIAL.
- AERIAL FIRE APPARATUS ACCESS ROADS IFC D105.1 WHERE REQUIRED. WHERE THE VERTICAL DISTANCE BETWEEN THE GRADE PLANE AND THE HIGHEST ROOF SURFACE EXCEEDS 30 FEET (9144 MM), APPROVED AERIAL FIRE APPARATUS ACCESS ROADS SHALL BE PROVIDED. FOR PURPOSES OF THIS SECTION, THE HIGHEST ROOF SURFACE SHALL BE DETERMINED BY MEASUREMENT TO THE EAVE OF A PITCHED ROOF, THE INTERSECTION OF THE ROOF TO THE EXTERIOR WALL, OR THE TOP OF PARAPET WALLS, WHICHEVER IS GREATER.
  - D105.2 WIDTH. AERIAL FIRE APPARATUS ACCESS ROADS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF 26 FEET (7925 MM), EXCLUSIVE OF SHOULDERS, IN THE IMMEDIATE VICINITY OF THE BUILDING OR PORTION THEREOF.
  - D105.3 PROXIMITY TO BUILDING. AT LEAST ONE OF THE REQUIRED ACCESS ROUTES MEETING THIS CONDITION SHALL BE LOCATED WITHIN A MINIMUM OF 15 FEET (4572 MM) AND A MAXIMUM OF 30 FEET (9144 MM) FROM THE BUILDING, AND SHALL BE POSITIONED PARALLEL TO ONE ENTIRE SIDE OF THE BUILDING. THE SIDE OF THE BUILDING ON WHICH THE AERIAL FIRE APPARATUS ACCESS ROAD IS POSITIONED SHALL BE APPROVED BY THE FIRE CODE OFFICIAL.
  - D105.4 OBSTRUCTIONS. OVERHEAD UTILITY AND POWER LINES SHALL NOT BE LOCATED OVER THE AERIAL FIRE APPARATUS ACCESS ROAD OR BETWEEN THE AERIAL FIRE APPARATUS ROAD AND THE BUILDING. OTHER OBSTRUCTIONS SHALL BE PERMITTED TO BE PLACED WITH THE APPROVAL OF THE FIRE CODE OFFICIAL.
- IFC 503.3- WHERE REQUIRED BY THE FIRE CODE OFFICIAL, APPROVED SIGNS OR OTHER APPROVED NOTICES OR MARKINGS THAT INCLUDE THE WORDS "NO PARKING-FIRE LANE" SHALL BE PROVIDED FOR FIRE APPARATUS ACCESS ROADS TO IDENTIFY SUCH ROADS OR PROHIBIT THE OBSTRUCTION THEREOF. THE MEANS BY WHICH FIRE LANES ARE DESIGNATED SHALL BE MAINTAINED IN A CLEAN AND LEGIBLE CONDITION AT ALL TIMES AND BE REPLACED OR REPAIRED WHEN NECESSARY TO PROVIDE ADEQUATE VISIBILITY.
- IFC 903.3.7- FIRE DEPARTMENT CONNECTIONS. THE LOCATION OF FIRE DEPARTMENT CONNECTIONS SHALL BE APPROVED BY THE FIRE CODE OFFICIAL. CONNECTIONS SHALL BE A 4 INCH STORZ TYPE FITTING AND LOCATED WITHIN 100 FEET OF A FIRE HYDRANT, OR AS APPROVED BY THE CODE OFFICIAL.

**PHASING SCHEDULE**

PHASE #	LOT/BLOCK	START	END
I	BLOCK 1 & BLOCK 2 & LOWENSTEIN		
II	LOT 1, 2 & 3, BLOCK 4		
III	BLOCK 2		
IV	LOTS 4 & 5, BLOCK 4		
V	BLOCK 5		

**SITE DATA**

BLOCK #	LOT #	USE	LOT SF	LOT AC	FLOOR AREA SF (ENVELOPE)	FLOOR AREA RATIO (FAR)	# OF FLOORS	PARKING SPACES REQUIRED (a)	PARKING SPACES REQUIRED (b)	PARKING SPACES REQUIRED (c)	PARKING SPACES PROVIDED (d)	AUTO ADA SPACES REQUIRED (VAN REQ'D)	AUTO ADA SPACES PROVIDED (VAN PROVIDED)
BLOCK 1	TRACT "A"		44,366	1.0									
1		RESTAURANT (SIT-DOWN)	60,432	1.4	6,500	0.1076		91			92	4 (1)	4 (2)
2		RESTAURANT (SIT-DOWN)	72,806	1.7	6,500	0.0893		91			91	4 (1)	4 (2)
BLOCK 2	1	GROCERY	273,118	6.3	63,119	0.2310		252			329	8 (1)	8 (0)
2		RETAIL	64,313	1.5	6,500	0.1010				33	89	4 (1)	0 (0)
3		RESTAURANT W/DRIVE THRU	40,217	0.9	5,500	0.1368		77			81	4 (1)	3 (0)
BLOCK 3	1	RESTAURANT	124,483	2.9	7,500	0.0602		105			157	6 (1)	0 (0)
2		RESTAURANT	112,028	2.6	7,500	0.0669		105			142	5 (1)	0 (0)
BLOCK 4	1	RESTAURANT (2 TENANTS)	166,647	3.8	12,545	0.0753		176			182	6 (1)	8 (0)
2		HOTEL (90 ROOMS) **	137,644	3.2	14,632	0.1063	4		135		185	6 (1)	6 (0)
3		HOTEL (130 ROOMS) **	179,415	4.1	22,326	0.1244	4		195		217	7 (1)	0 (0)
4		BALL COURTS *	146,587	3.4							121	5 (1)	0 (0)
TOTAL					152,595 SF								

- (a) OFFICE & GROCERY STORE: 4 / 1,000 SF GFA
- (b) RESTAURANT FAST FOOD AND SIT DOWN: 14 / 1,000 SF GFA
- (c) HOTEL: 1.5 / ROOM
- (d) RETAIL: 5 / 1000 SF GFA
- MULTI-FAMILY RESIDENCE: 1 / EFFICIENCY OR STUDIO UNIT, 1.5 / 1 OR 2 BEDROOM UNIT, 2 / 3 OR MORE BEDROOM UNIT
- RETIREMENT COMMUNITY: 0.5 / UNIT FOR VISITOR PARKING, 1 / DWELLING UNIT, 1 / EMPLOYEE ON MAX SHIFT

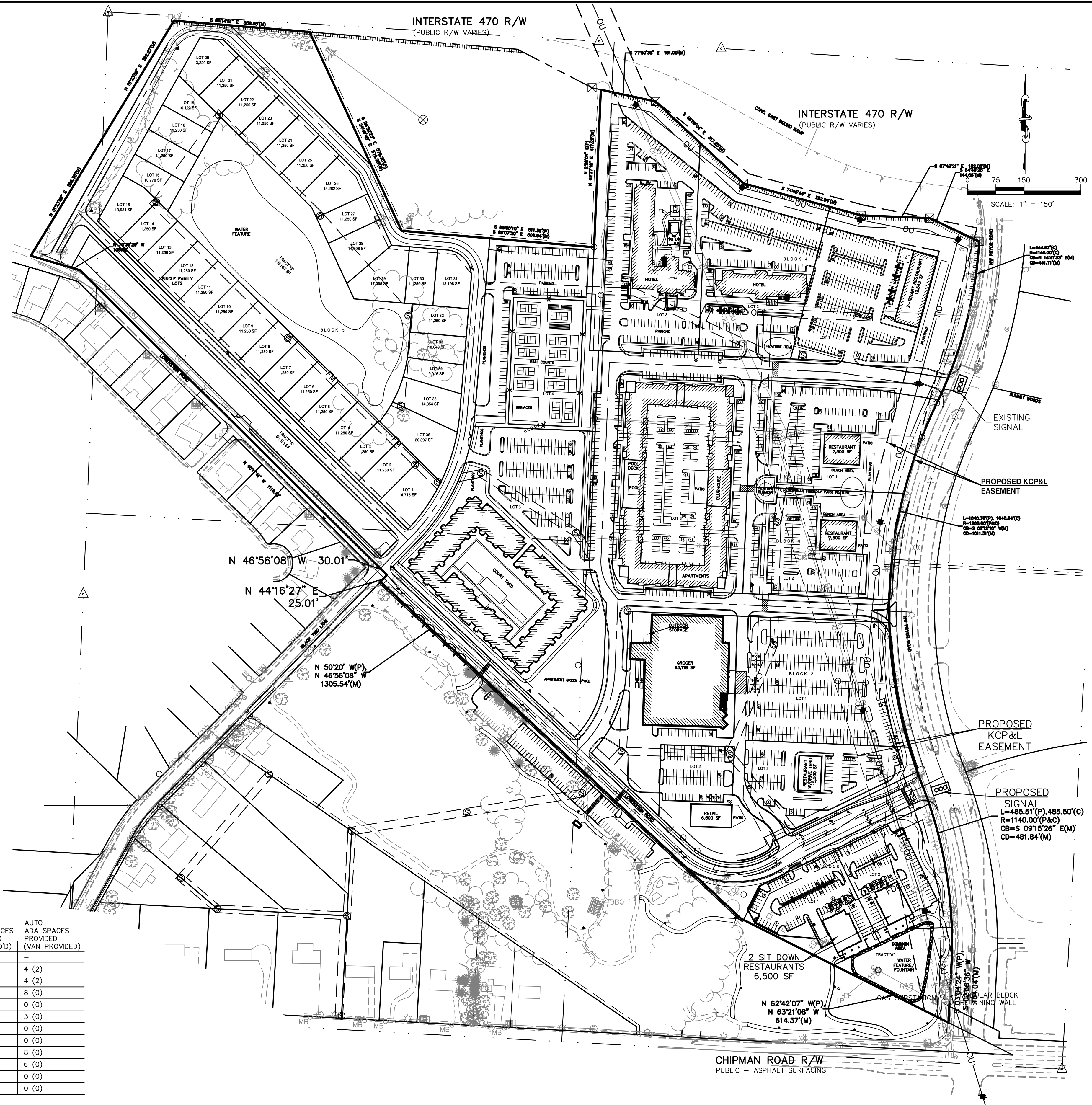
\* OUTDOOR RECREATION FACILITY - TO BE DETERMINED BY DIRECTOR AT PLAN APPROVAL  
 \*\* POTENTIAL TO BE MORE THAN 4 STORIES

NOTE: BUILDING HEIGHTS TO BE DETERMINED

**RESIDENTIAL DATA**

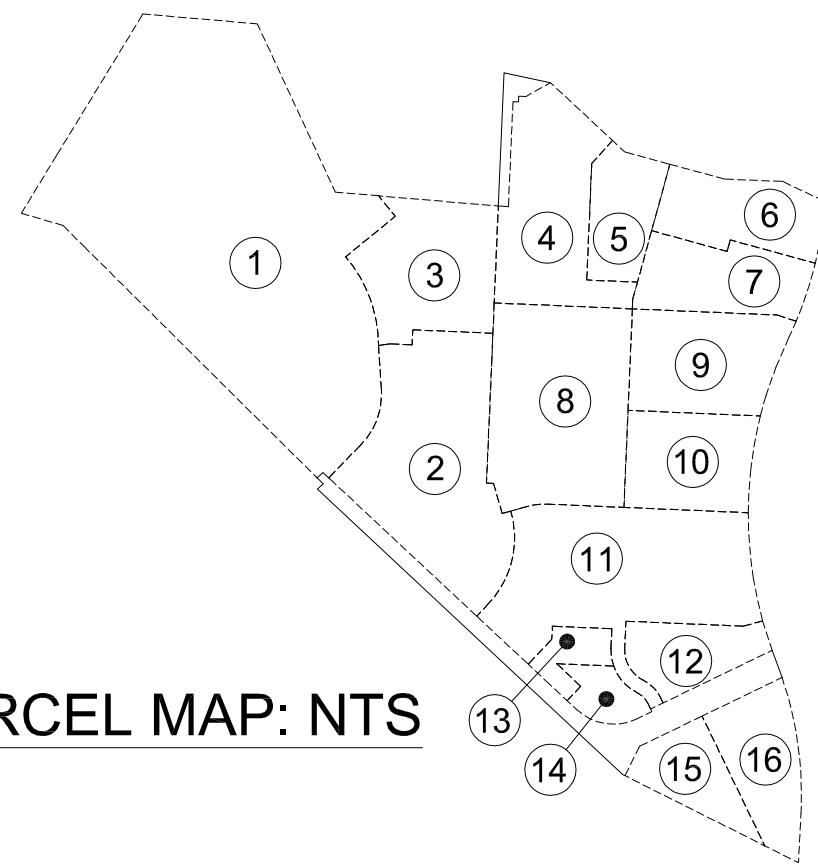
BLOCK #	LOT #	USE	LOT SF	LOT AC	FLOOR AREA SF (ENVELOPE)	FLOOR AREA RATIO (FAR)	# OF DWELLING UNITS	DWELLING UNITS PER AC	# OF FLOORS	STUDIO 1 BDRM	1 OR 2 BDRM	3 OR MORE BDRM	PARKING SPACES REQUIRED	PARKING SPACES PROVIDED	AUTO ADA SPACES REQUIRED (VAN REQ'D)	AUTO ADA SPACES PROVIDED (VAN PROVIDED)
BLOCK 3	3	APARTMENTS	196,539	4.5	81,164	0.4130	250	55.6	4	113	113	24	331	213		
BLOCK 4	5	SENIOR LIVING ***	68,679	6.5	68,679	0.2442	165	25.4	4				170	186	2 (1)	0 (0)
TOTAL					149,843 SF		415									

\*\*\*5 EMPLOYEES EACH SHIFT



CHK	
DWN	
DESCRIPTION	
REV	DATE
LEON D. OSBOURN ENGINEER MO # 021726	
2319 N. JACKSON   P.O. BOX 1304 JUNCTION CITY, MISSOURI 64441 PH. (785) 782-5040   FAX (785) 762-7744 www.kawvalley.com   www.kawvalley.com	
KAW VALLEY ENGINEERING, INC. IS AUTHORIZED TO OFFER ENGINEERING SERVICES IN MISSOURI STATE CERTIFICATE OF AUTHORITY # 00894Z. EXPIRES 12/31/18	
<b>STREETS OF WEST PRYOR</b> <b>NWQ PRYOR ROAD &amp; LOWENSTEIN DRIVE</b> <b>LEE'S SUMMIT, MISSOURI</b> <b>PRELIMINARY DEVELOPMENT PLAN</b> <b>OVERALL SITE PLAN</b>	
PROJ. NO.	A14_7067-1
DESIGNER	LDO
DRAWN BY	JT
CFN	
7067-1PDS-SP	
SHEET	REV
C-4	





**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)

**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

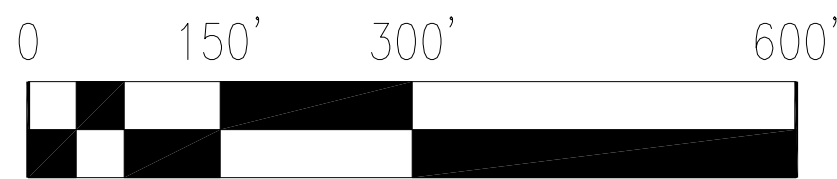
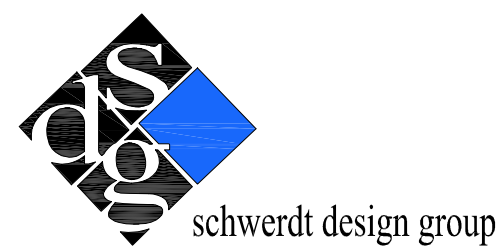
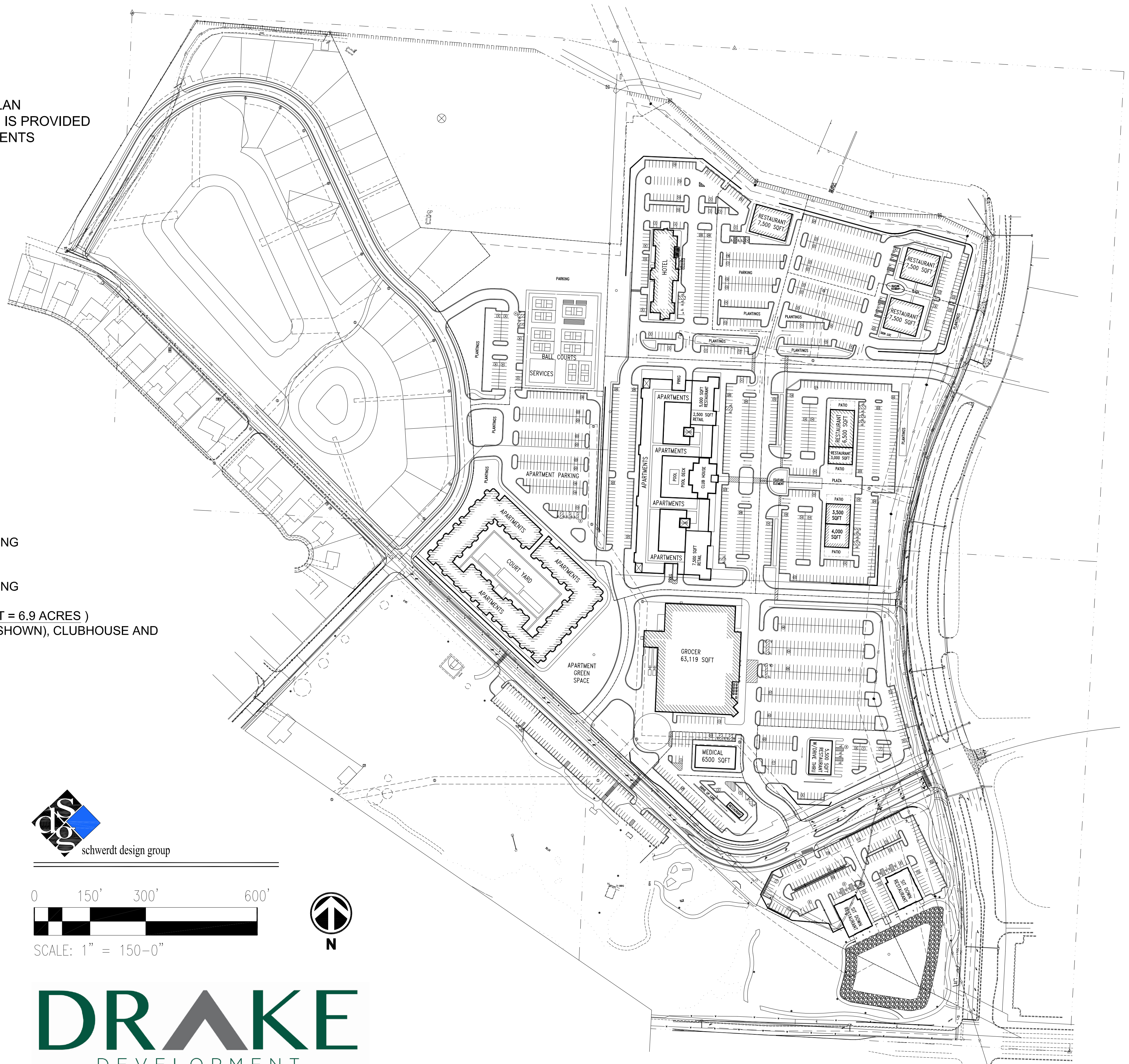
**PARCEL 12:** RESTAURANT ( PARCEL 76,395 SQFT = 1.8 ACRES )  
 5,500 SQFT RESTAURANT WITH DRIVE THRU AND SURFACE PARKING

**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



SCALE: 1" = 150'-0"



**DRAKE**  
 DEVELOPMENT

New Site Plan



Trip Generation - 10th Edition - October 2018 Site Plan

Parcel (#)	Building Use (text)	Phase 1 or 2	Dwelling Units (#)		Building Size Sq Ft (sq ft)	ITE Land Use Code (#)	ITE Page Number (#)	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	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

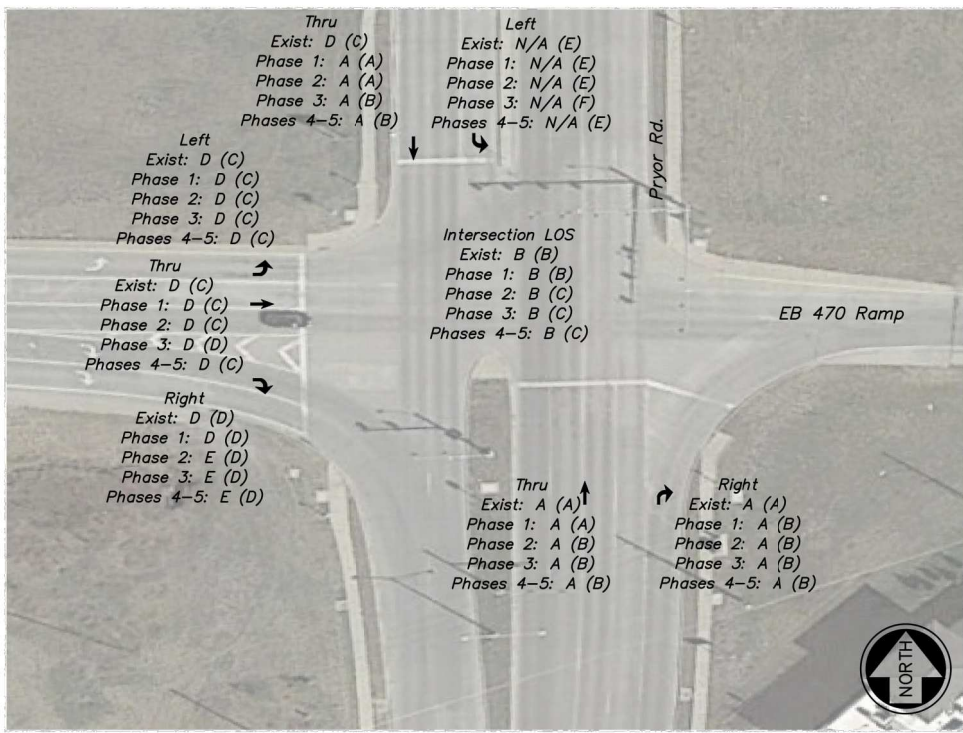


Exhibit E

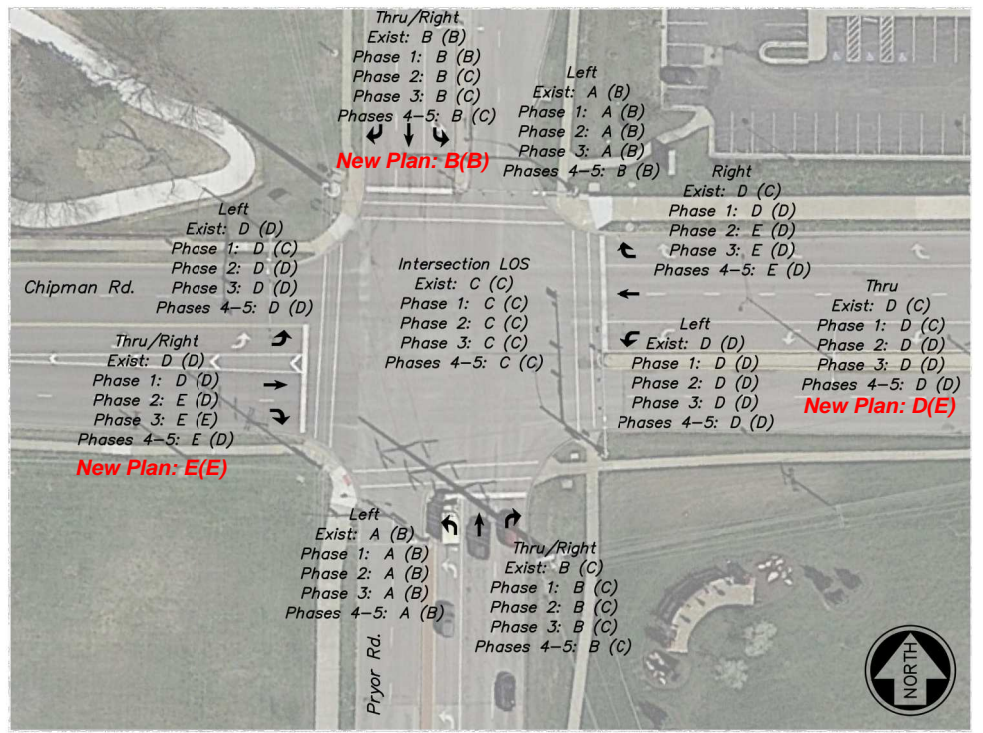


Exhibit B

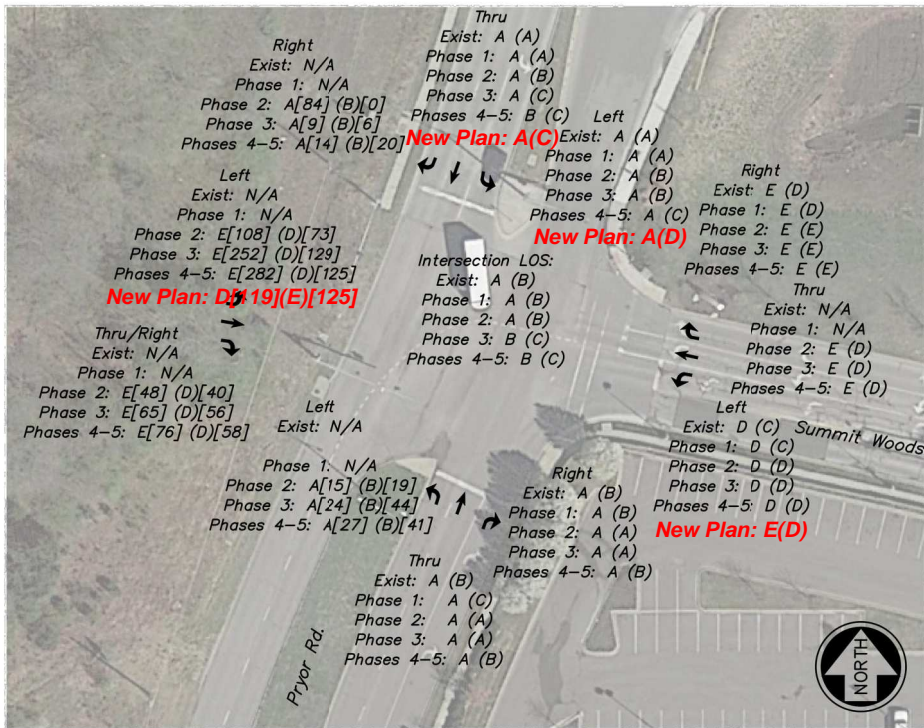


Exhibit F

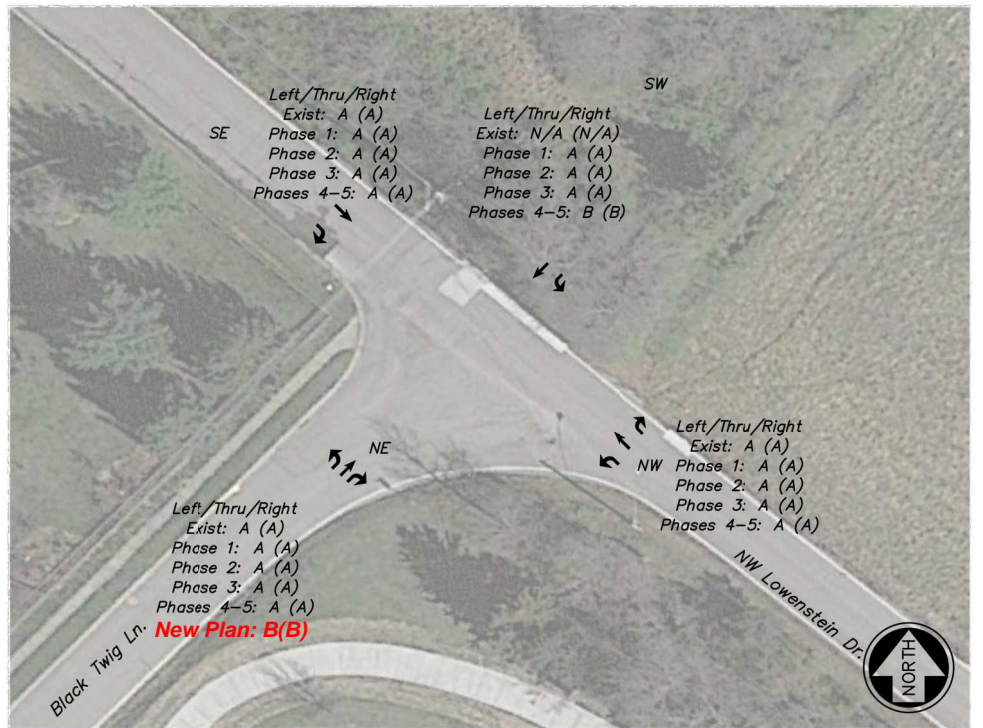


Exhibit C

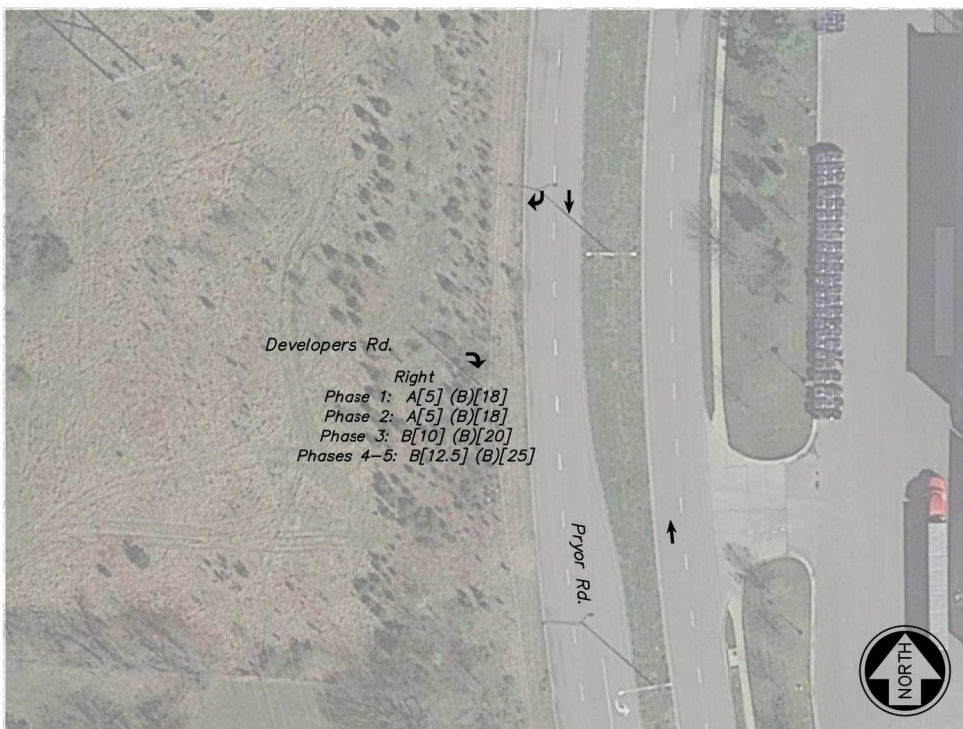


Exhibit G

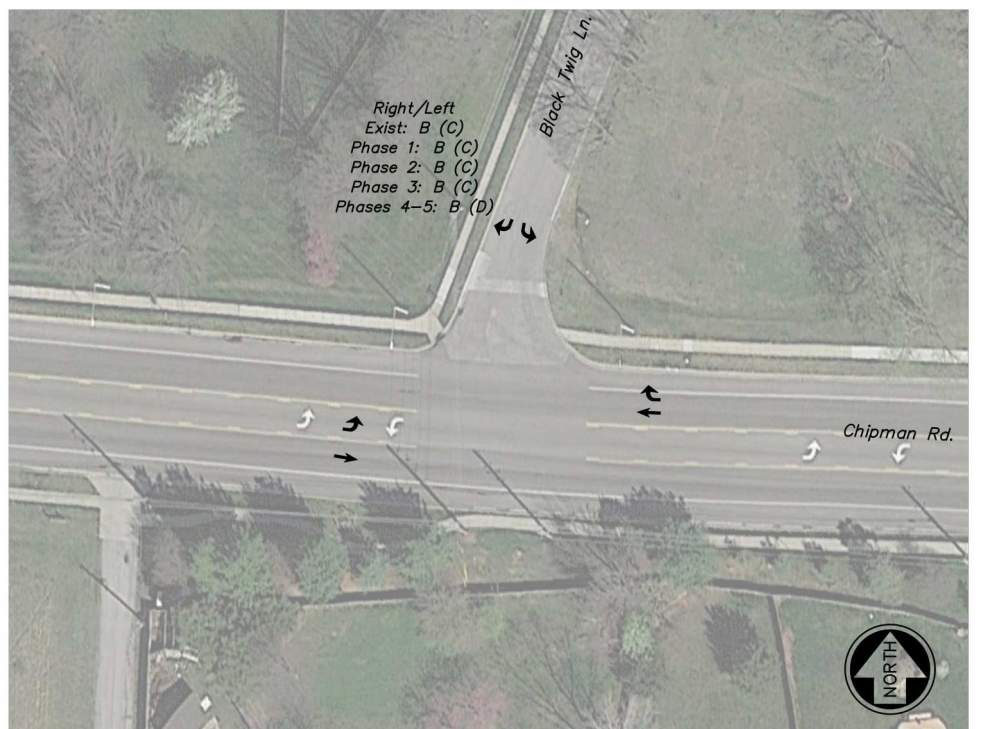
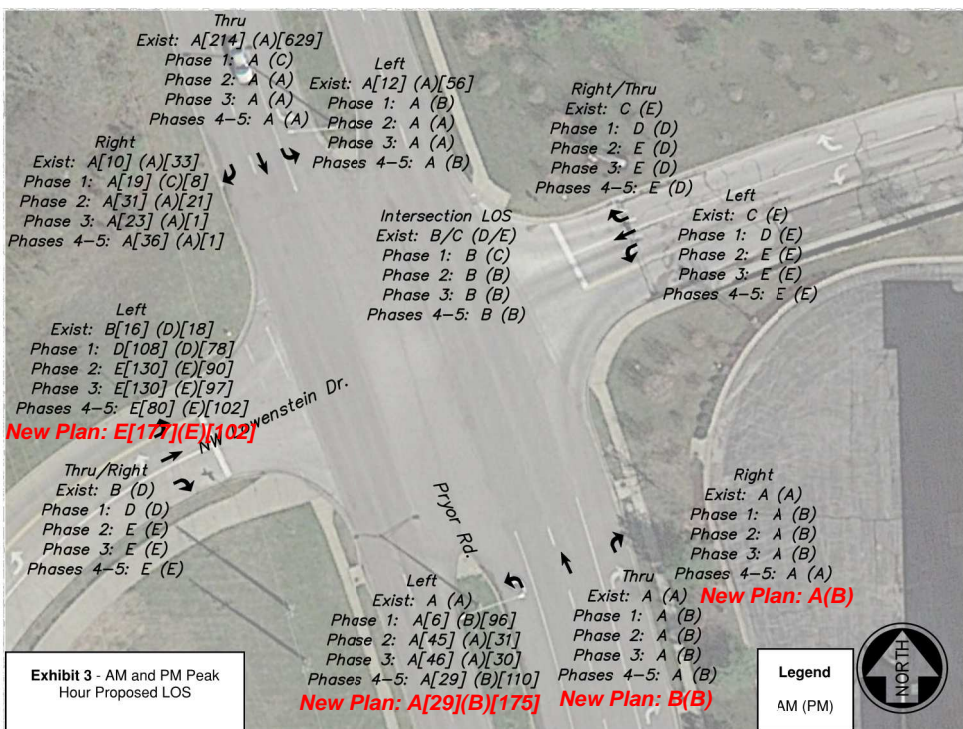


Exhibit D



Overall Layout

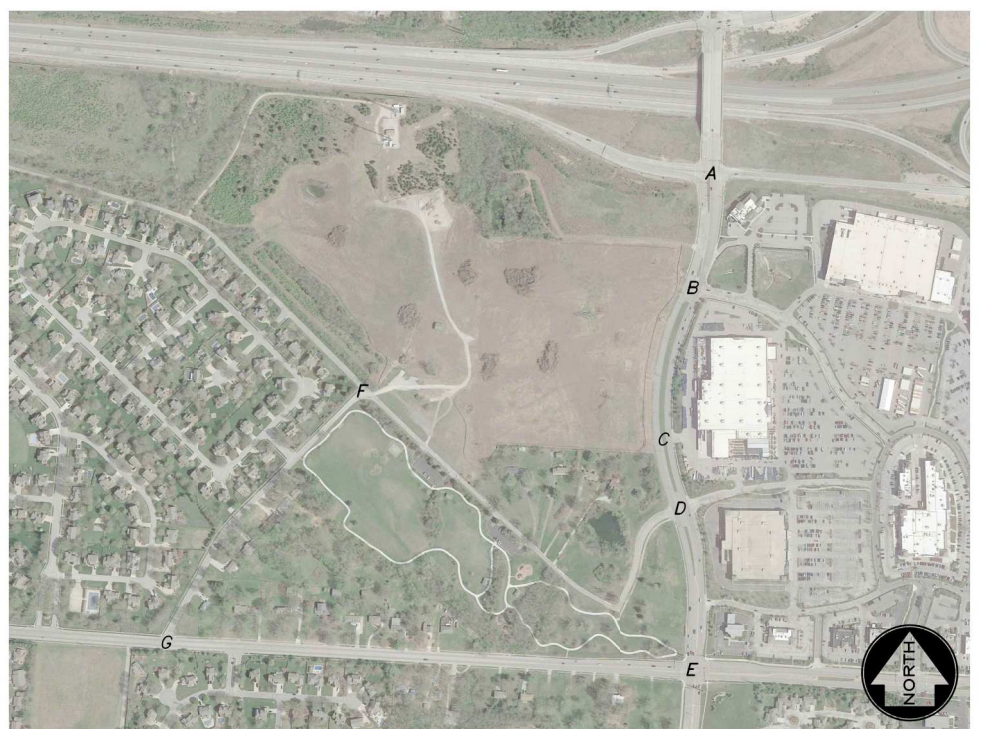


Exhibit 3 - AM and PM Peak Hour Proposed LOS

Legend AM (PM)