1849 Park Traffic Impact Analysis

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1.0 EXECUTIVE SUMMARY

Stantec Consulting Services Inc. (Stantec) was retained to complete a traffic impact study for the proposed 1849 Park, to be located along Cameron Road between Pecan Street and Fuchs Grove Road in Pflugerville, Texas. The development will be constructed in two phases but is expected to be fully developed by 2030. Considering background growth and future roadway infrastructure, the study intersections are expected to operate at a reasonable level of service. Based on the sight distance analysis under existing conditions for Cameron Road at the proposed southeast driveway, the sight distance is adequate for the Phase 1 driveway.

To allow the best progression in and around the development, the following items are recommended:

- The existing vertical curve between the future intersection of Cameron Road and Melber Road could cause sight distance issues and should be evaluated during the design of Melber Road.
- The storage lengths in the table below should be provided for the study intersection. The analysis assumed a 12-foot lane width.

Intersection	Approach	2030 Build Condition 95th Percentile Queue (ft)	City Minimum Left Turn Storage Length (ft)	Proposed Storage Length (ft)
Cameron Rd & Melber Rd	EB-L	40	100	100
Cameron Rd & SE Driveway	EB-L	20	100	100
	WB-R	--	100	100
Melber Rd & SW Driveway	SB-L	20	100	100
	WB-R	--	100	100
Melber Rd & Mid Driveway	SB-L	20	100	150
	WB-L/R	20	100	100
Melber Rd & NW/NE Driveways	NB-L	20	100	100
	NB-R	-		100
	SB-L	20	100	100
	WB-L/R	60	100	150

2.0 INTRODUCTION

Stantec Consulting Inc. (Stantec) was retained to complete a traffic impact study for the proposed 1849 Park site, to be located along Cameron Road between Pecan Street and Fuchs Grove Road in Pflugerville, TX. At its full build-out estimated for the year 2030, the site is expected to contain the following:

- eleven multi-purpose fields for football/soccer/lacrosse/etc.
- six baseball/softball fields
- eight tennis courts
- two basketball courts
- eight sand volleyball courts
- a dog park (5 acres)
- a destination playground and splash pad (1 acre)
- areas for open play and festivals
- a 2,000-seat amphitheater
- a wildflower and prairie preserve

In addition to normal park usage, the site is expected to host the annual Deutschen Pfest festival and other similar special events. The festival, typically in mid-May, currently sees around 10-12,000 visitors over three days, from Friday through Sunday. This report includes a study of the estimated traffic operations related to special even traffic and general peak of the recreational fields.

The site driveways will be linked by internal roadways, and will have a total of five connections onto Cameron Road and the future Melber Road. The location of the proposed site is shown in **Figure 1**. A scaled-down version of the site plan is shown in **Figure 2**, with the full-sized plan provided in **Appendix A**.

Figure 1 Proposed Site Location

Figure 2 Proposed Site Plan

3.0 DATA COLLECTION AND EXISTING CONDITIONS

For this study, turning movement counts were collected at intersections near the proposed sites as part of another project. A site visit was made to the study area to document traffic operations, geometric characteristics, and sight distances.

3.1 TRAFFIC COUNTS

For this study, traffic counts provided by the City for the intersections of Cameron Road at Pecan Street and Cameron Road at Fuchs Grove Road were collected on Wednesday, August 5, 2015. Local schools were not in session during this date. These turning movement counts were used to estimate volumes along Cameron Road at the proposed site. The counts were collected during a weekday during an AM peak hour of 7:00-9:00AM and a PM peak hour of 4:00-6:00PM. A factor was applied to convert these counts to an estimated Saturday peak hour volumes based on 24-hour weekday and Saturday volumes collected on other projects.

All count data received from the City is provided in **Appendix B**.

3.2 SITE VISIT

A site visit was conducted by Stantec staff on Friday, January 6, 2017. During the site visit, geometric conditions at each study intersection were noted. In addition, general traffic operation conditions were observed.

The site visit allowed engineers to review topography for a better understanding of the sight distance. Cameron Road is expected to become a 6-lane roadway by the time this park is full built-out and the roadway project will smooth the current sharp curves in the roadway.

At the time of the site visit, dirt work was underway for Phase 1 of the proposed park. This allowed the engineer to see the planned location of the southeast driveway onto Cameron Road.

3.3 EXISTING AND FUTURE ROADWAY DESCRIPTIONS

Cameron Road is a two-lane, undivided major arterial, as classified in the Pflugerville Master Thoroughfare Plan. At the proposed site, the posted speed limit is 55 mph, however an s-curve near the southwest corner of the future site has a recommended speed of 45 mph.

In the City of Pflugerville Master Transportation Plan, Cameron Road is expected to be widened to a six-lane roadway by the year 2035. The s-curve adjacent to the proposed site is also expected to be smoothed in order to avoid the need for a lower recommended speed.

Melber Road is included in the City of Pflugerville Master Transportation Plan to be a 4 to 5-lane roadway by the year 2035. It is expected to run north/south, from Cameron Road to Rowe Lane. The roadway would provide access to four of the five driveways of the proposed site.

For purposes of this study, it will be assumed that the improvements to Cameron Road and the new construction of Melber Road will be completed by the year 2030, the estimated full build-out year of the proposed site.

4.0 FUTURE BACKGROUND TRAFFIC FORECASTS

Background traffic growth was estimated by using average daily traffic figures from TxDOT's Transportation Planning Maps. Historical average daily traffic (ADT) were observed from 2012 to 2015 in the area around the proposed site and grown to the build year 2030. The build year of 2030 was selected based on when the park will be fully constructed.

The historical ADT volumes near the project site showed a yearly growth rate of 15%. This growth rate, however, is not expected to sustain until the build year; therefore, a long-term growth rate of 5% was also used. The growth rates were applied as follows:

- 15% growth from 2015 to 2020
- 5% growth from 2020 to 2030

No background developments were indicated to be included in this study; therefore, only the grown counts were considered for the background future traffic forecast.

5.0 PROJECTED SITE TRAFFIC

The traffic generated by the proposed sites was estimated through trip generation and trip distribution analyses. The turning movement volumes at each of the proposed site's driveways and the intersection of Cameron Road and Melber Road will be presented as the result of this analysis.

5.1 PROJECT SITE TRIP GENERATION

The standard practice for estimating site trip generation is to use the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*, 9th Edition. Data previously collected at some parks in Texas was also utilized to estimate the trip generation for those development components that do not fit into standard ITE Trip Generation land use categories.

For the park's general use, the following sources were used to estimate trip generation figures:

- Sport Fields: Using ITE trip generation estimates for the land use "Soccer Complex" (Code 488), the volumes were deemed to be unrealistically low. As a more conservative estimate, data collected at another soccer field in McKinney, Texas was utilized. The data showed PM peak hour trips were 93% higher than the ITE rates and Saturday trips were 3% higher than ITE rates.
- Dog Park and General Park Land: Engineering judgement was used, as ITE did not provide useable figures for these land uses.
- Tennis/Basketball/Volleyball Courts: ITE estimates for the land use "Tennis Courts" (Code 490) were used for all courts, as ITE does not provide estimates for basketball and volleyball courts. To account for higher per-court usage for basketball and volleyball courts, their trip generation rates were adjusted: a basketball court was assumed to attract as many trips as three tennis courts; a volleyball court was assumed to attract as many as two tennis courts.
- Playground/Splash Pad: Trip generation rates were based upon data collected at two parks in the Dallas region that included 8,500-9,000 SF of play structures and included splash pad areas.

Pflugerville's annual Deutschen Pfest festival is also expected to use the proposed site and the event was used to analyze a possible special event traffic scenario. The festival demand of around 10,000-12,000 visitors over three days (Friday – Sunday). Engineering judgement was used to estimate a peak day of 5,500 visitors to the festival; from there, a peak period was estimated to generate 20% (1,100 trips) of the total trips for that peak day. The peak ingress and egress time is expected to be on a Saturday.

Trip generation for the proposed site's general use was conducted for a Saturday peak hour, which is typically the highest peak hour usage for a park. General park use and the festival are expected to not occur simultaneously, and their trip generation estimates were not combined.

The trip generation estimates for general park use are shown in **Table 1**; the trip generation estimate for the festival is shown in **Table 2**.

Table 1 Proposed Site Saturday Peak Hour Trip Generation (2030) — General Park Use

Land Use	Saturday Peak		
	Total Peak Hour Trips	In	Out
Sport Fields (17 total fields)	533	235	298
Dog Park (5 acres)	100	50	50
Tennis/Basketball/Volleyball Courts (18 total courts)	101	51	50
Playground/Splash Pad (1 acre)	100	50	50
General Park Land	80	60	60
Total	**954**	**446**	**508**

Table 2 Proposed Site Trip Generation (2030) — Special Event

		Festival Peak		
	Total Daily Trips	Total Peak Trips	In	Out
Deutschen Pfest Festival	**5500**	**1100**	**528**	**572**

5.2 TRIP DISTRIBUTION & ASSIGNMENT

A trip distribution analysis is used to estimate how site-generated trips enter and exit the project's study area. For this study, the external trip distribution was based on the 2035 volume counts stated in the City of Pflugerville Master Transportation Plan (2013) to account for future development in the area toward the year 2030. The trip distribution assumptions are shown in **Figure 3**. The trip distribution percentages were assumed to be the same for inbound and outbound traffic.

Figure 3 Proposed Site Trip Distribution (2030)

5.3 SITE TRAFFIC VOLUMES

The resulting site trips for each intersection within the study area based on the trip generation, distribution and assignment analyses are shown in **Figure 4** for general park use, and **Figure 5** for the Special Event traffic. The site traffic volumes assume that no improvements would be made within the study area.

Figure 4 Project Site Traffic Saturday Volumes (2030) — General Park Use

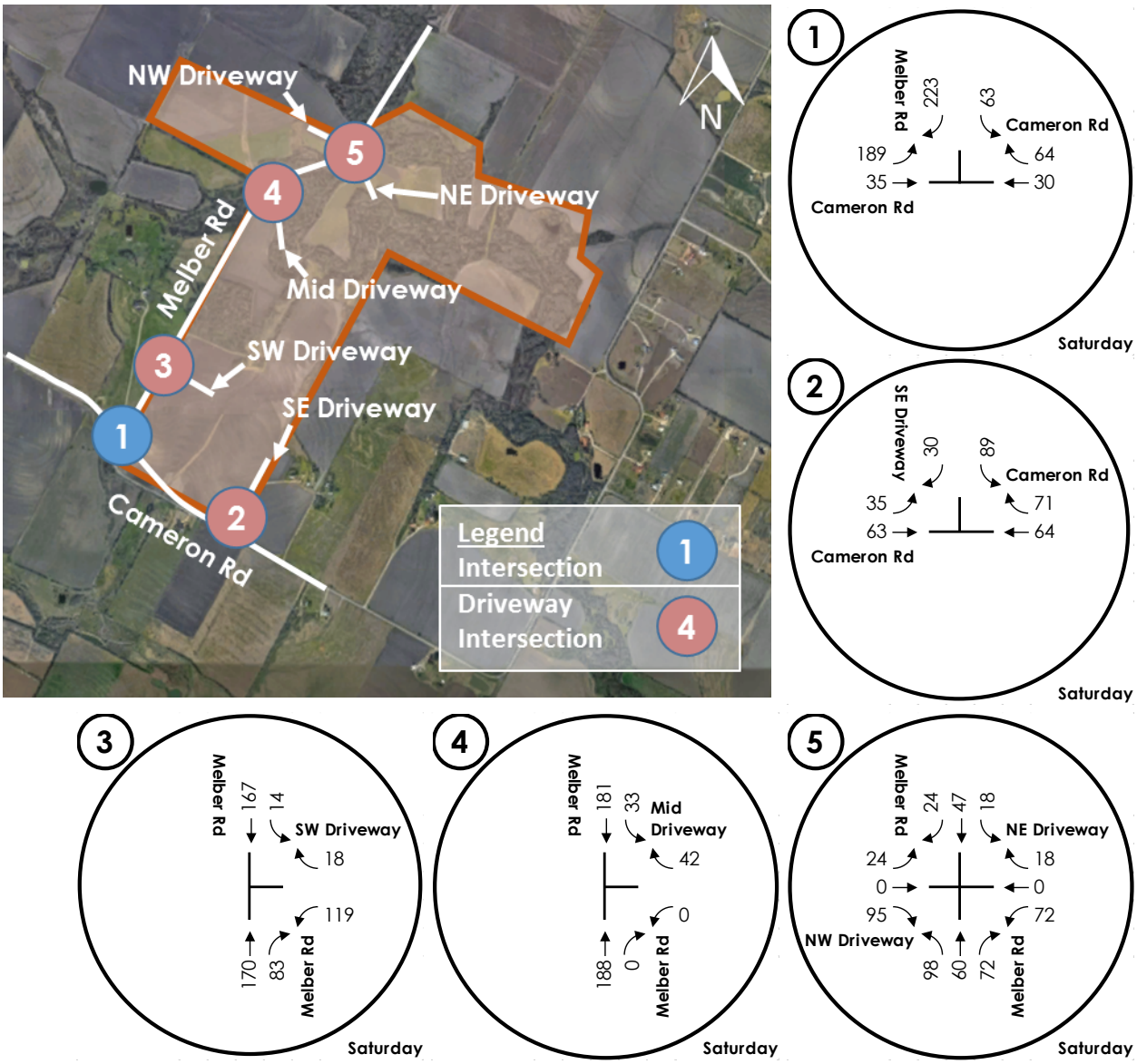
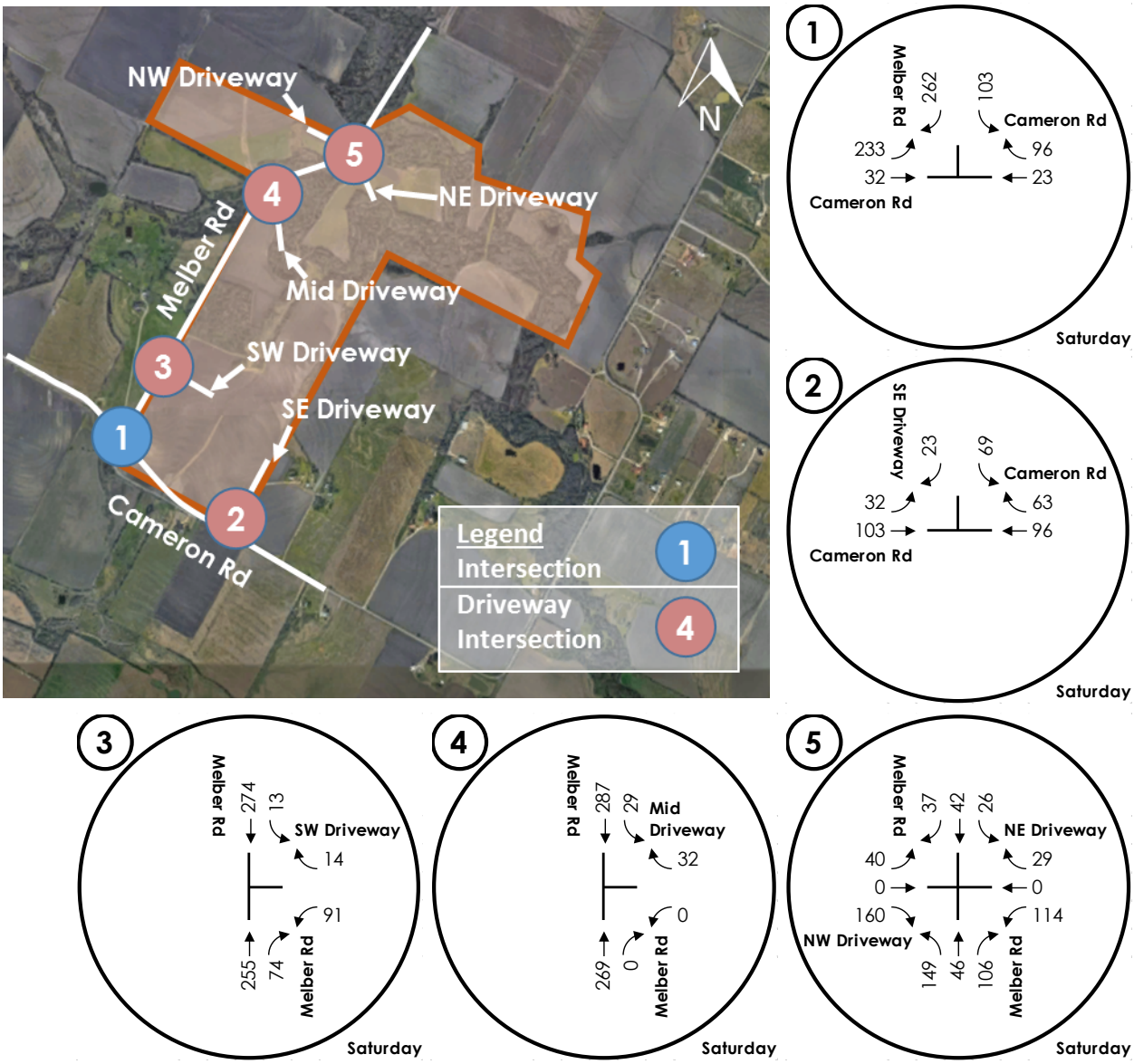


Figure 5 Project Site Traffic Volumes (2030) — Special Event



6.0 TRAFFIC ANALYSIS

6.1 METHODOLOGY

Synchro™ Version 9 was used to perform capacity analysis at each intersection. The capacity analysis functions in Synchro are based on the Transportation Research Board's *Highway Capacity Manual* (HCM), Ed. 2010. The HCM is a nationally recognized standard for performing capacity analyses. The reports generated from each *Synchro* model are shown in **Appendix C**.

Capacity analyses are evaluated based on a level of service that ranges from A (excellent) to F (poor). Levels of service A through D are generally considered acceptable and levels of service E and F are considered unacceptable. The city of Pflugerville Engineering Design manual states that all signalized and all-way stop intersections shall operate at a level of service of 'D' or better with a volume to capacity (V/C) ratio of 0.95 or less. Other un-signalized intersections (including un-signalized private accesses) shall operate at level of service 'E' or better for major street left turns on side street approaches. A LOS of 'F' may be allowed if the movement has a relatively low V/C ratio and there are no known safety problems at the intersection. The level of service thresholds in the Highway Capacity Manual for signalized intersections and stop-controlled intersections are shown in **Table 3**.

Table 3 Intersection Level of Service Thresholds

LOS	Control Delay Per Vehicle (seconds)	
	Signalized Intersection	Stop-Controlled Intersection
A	≤ 10	≤ 10
B	>10 and ≤20	>10 and ≤15
C	>20 and ≤35	>15 and ≤25
D	>35 and ≤55	>25 and ≤35
E	>55 and ≤80	>35 and ≤50
F	> 80	> 50

6.2 FUTURE BUILD CONDITION

The future build condition volumes are the sum of the estimated background traffic growth and the projected traffic generated by the project site. Analysis was done for the intersection of Cameron Road and Melber Road, and the four site driveways which intersect either Cameron Road or Melber Road. The estimated future build volumes for general park use during a Saturday peak hour are shown in **Figure 6**; the future build volumes for the special event are shown in **Figure 7**.

Figure 6 Future Build Saturday Volumes (2030) — General Park Use

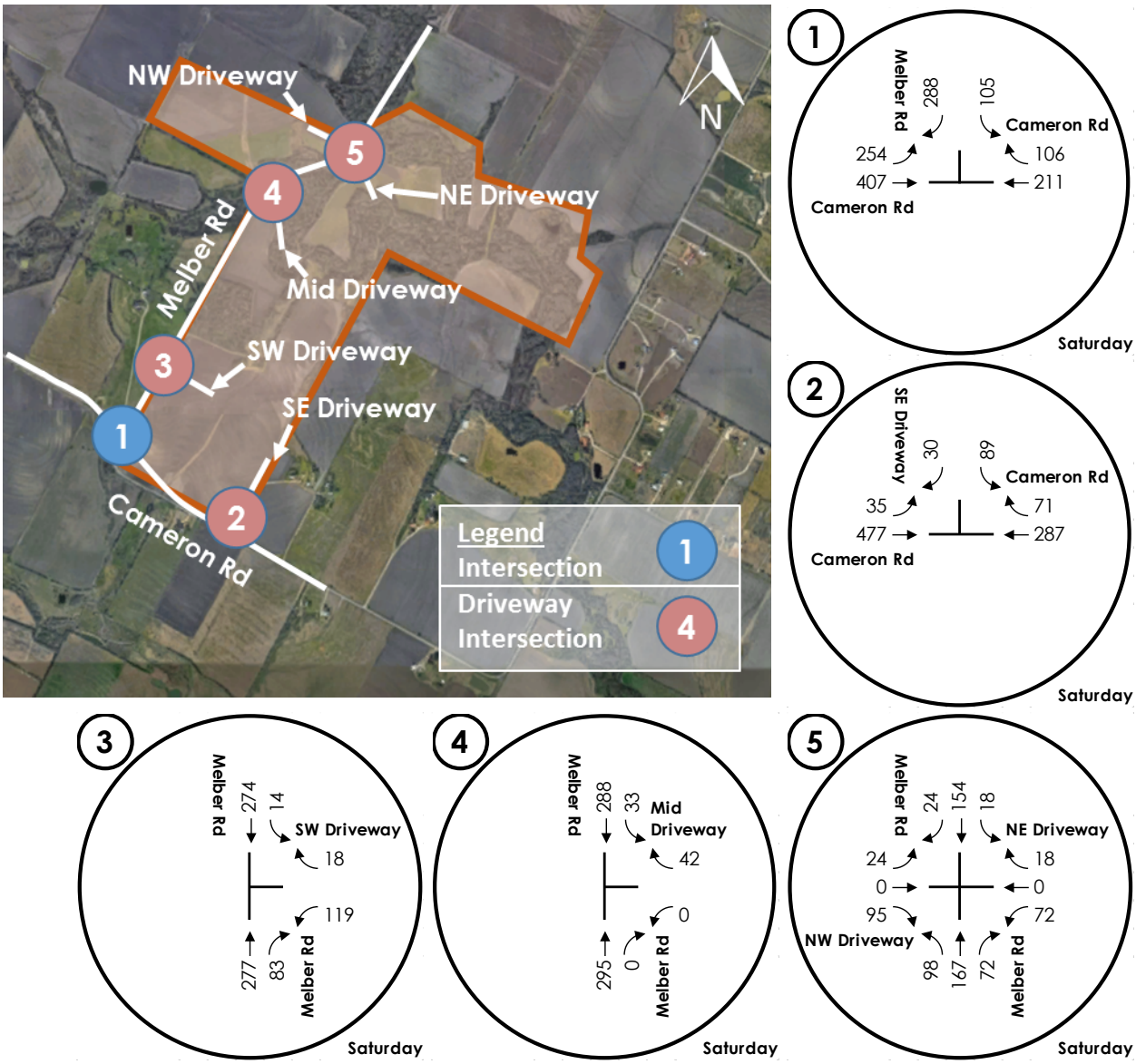
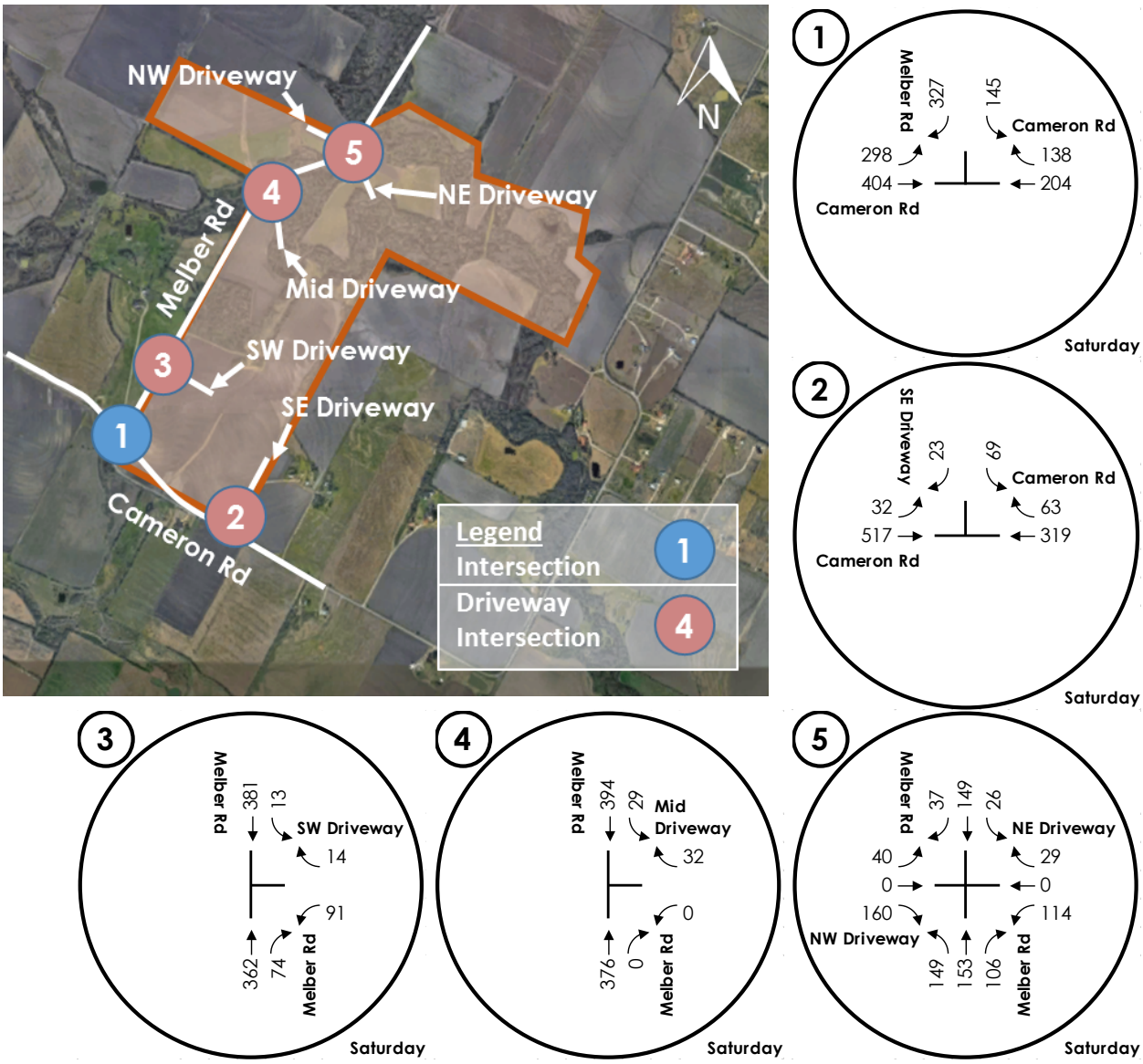


Figure 7 Future Build Volumes (2030) — Special Event



The results of the future build condition capacity analysis are shown in **Table 4**. For both general park use and special event use, the only movement expected to face a level of service lower than LOS D would be the southbound left turn movement at Cameron Road and Melber Road. The worst-case scenario would occur with general park use, with an estimated delay of 75 seconds and a 95th-percentile queue of around 5 vehicles. Because this delay is expected to occur only during the Saturday peak hour when all fields are in use (i.e. once per week), improvements to the intersection would not be deemed necessary at this point in time.

Table 4 Future Build Condition Capacity Analysis (2030)

No.	Intersection	Control Type	Approach	Level of Service (Delay [s])			
				General Park Use		Special Event	
				Approach	Overall	Approach	Overall
1	Cameron Rd & Melber Rd	Side-Street Stop	EBL	11 (B)	*	11(B)	*
			SBL	**36 (E)**		**97 (F)**	
			SBR	13 (B)		13(B)	
2	Cameron Rd & SE Driveway	Side-Street Stop	SB	15 (B)	*	15 (B)	*
			EBL	10(A)		10 (B)	
			WB	n/a		n/a	
3	Melber Rd & SW Driveway	Side-Street Stop	NB	n/a	*	n/a	*
			SBL	8 (A)		8 (A)	
			WB	15 (C)		17 (C)	
4	Melber Rd & Mid Driveway	Side-Street Stop	NB	n/a	*	n/a	*
			SBL	8 (A)		8 (A)	
			WB	9 (A)		10 (A)	
5	Melber Rd & NW/NE Driveways	Side-Street Stop	NBL	8 (A)	*	8 (A)	*
			SBL	8 (A)		8 (A)	
			EB	11 (B)		13 (B)	
			WB	17 (C)		32 (D)	

**Overall LOS not defined by HCM methods for side-street stop controlled intersections.*

Festival and typical weeknight traffic operate similarly. In both scenarios, most movements operate at LOS D or better, except for the SB left turn at Cameron Rd and Melber Rd, which fails during both peak analysis hours. As noted in Tables 1 and 2 above, the project generates more traffic during a festival than during a typical Saturday. Therefore, delay was noted to be higher for each turning movement and approach during the festival.

7.0 ACCESS MANAGEMENT

For the proposed driveways along Cameron Road and Melber Road, a roadway analysis was done to determine whether additional lanes would be needed at each of the driveways within the proposed site. For the future driveway along Cameron Road, an intersection sight distance analysis was performed. Lastly, an auxiliary lane analysis was done to determine whether right-turn ingress and/or egress lanes (i.e. turn bays) would be required to meet TxDOT standards.

7.1 INTERNAL ROADWAY ANALYSIS

For the capacity analysis shown in **Table 4** on page 6.4, it was assumed that each of the site driveways would have one lane both to enter and exit the site. At the intersection of Melber Road and Cameron Road, separate left-turn and right-turn lanes were used on the southbound approach along Melber Road.

Based on the peak hour analysis, delays at each of the site driveways is expected to be low. An extra lane may be considered at each of the site driveway intersections to separate left turn and right turn movements out of the site; doing so would reduce delay for right-turn movements out of the site.

The Highway Capacity Manual provides planning level of service criteria based on a roadway's number of lanes and the presence of exclusive left-turn lanes. **Table 5** shows the level of service thresholds for directional volume assuming uninterrupted flow in an urban area. Based on these volume tables, all roadways within the park should be able to operate as 2-lane undivided roadways.

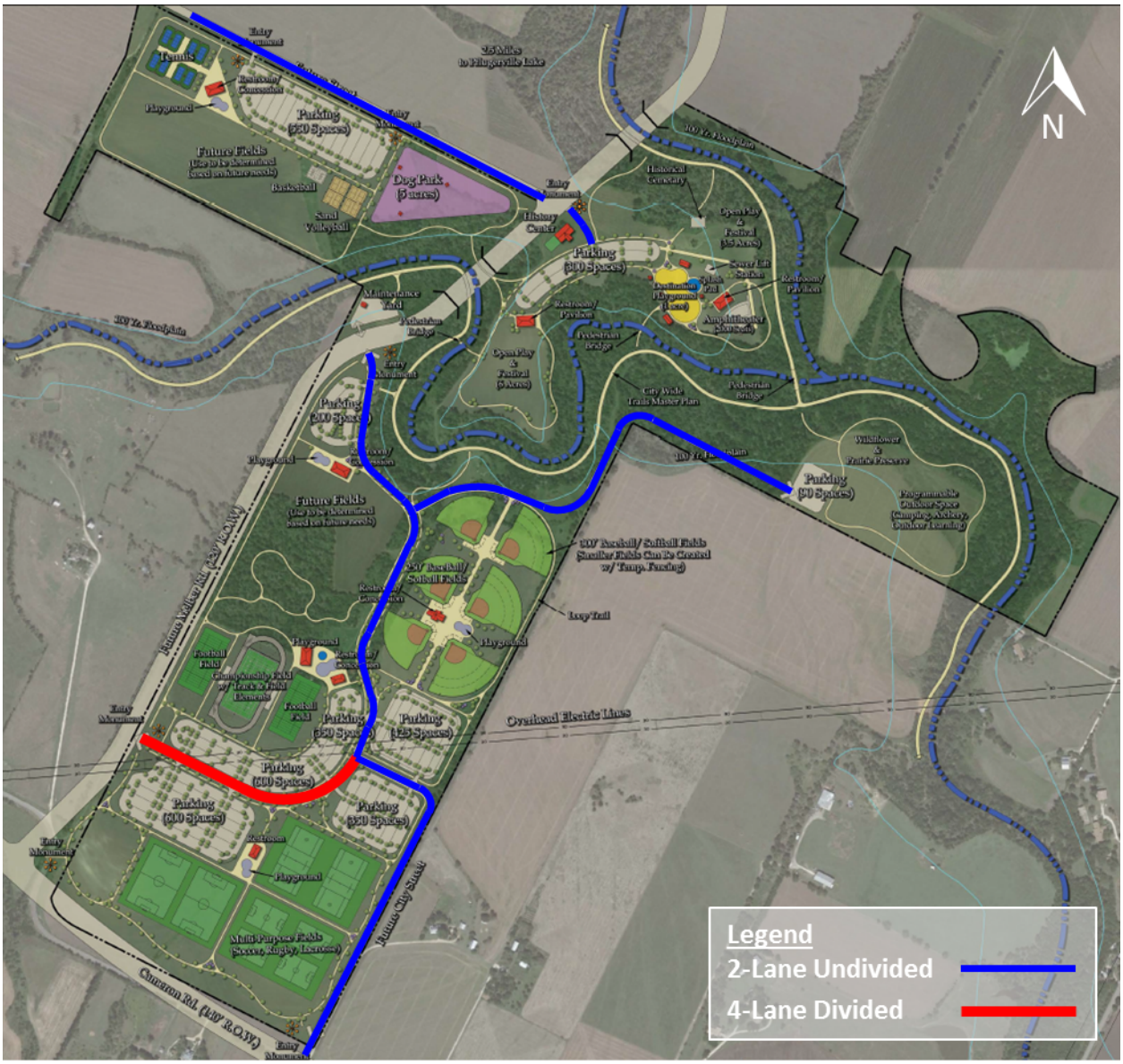
Table 5 Uninterrupted Roadway Level of Service

Peak Hour Directional Volumes — Urbanized Areas — Uninterrupted Flow Highways						
Type	Exclusive Left-Turn Lane?	LOS B	LOS C	LOS D	LOS E	LOS F
1-Lane Undivided	No	420	840	1,190	1,640	**>1,640**
1-Lane Divided	Yes	441	882	1,250	1,722	**>1,722**
2-Lane Undivided	No	1,358	1,920	**2,430**	2,693	>2,693
2-Lane Undivided	Yes	1,720	**2,432**	3,078	3,411	>3,411
2-Lane Divided	Yes	1,810	**2,560**	3,240	3,590	>3,590

If an assumption was made that a third of the parking lot capacity on the southern side (2,325 spaces) entered or exited the parking lots over a 15-minute period, and two-thirds used the southwest driveway onto Melber Road, the equivalent peak hour demand would be 2,066 vehicles per hour. As shown in the table, a four-lane roadway (two lanes in each direction) would be needed to achieve an LOS D or better during this peak period.

In addition to providing adequate access during a peak intake or discharge of traffic, a four-lane median divided roadway would allow for flexible operation along the roadway; for example, a bus to shuttle people from the parking to the festival grounds could stop along the roadway to pick up passengers from the parking lot entrances and not block incoming vehicles. This four-lane roadway could be built from the southwest driveway along Melber Road to the roadway's intersection with the driveway leading to the southeast entrance of the site. **Figure 8** shows the recommended number of lanes throughout the proposed site.

Figure 8 Internal Roadway Number of Lanes



7.2 INTERSECTION SIGHT DISTANCE

Required intersection sight distance is based on meeting the threshold for stopping sight distance for a given speed. Stopping sight distance is calculated as the sum of the "Brake Reaction Distance", or the distance traveled before beginning to brake, and the "Braking Distance", or the distance traveled while braking. AASHTO's *A Policy on Geometric Design of Highways and Streets, Ed. 2011* calculates stopping sight distance based on studies in reaction time and deceleration while braking.

The results of the intersection sight distance analysis are shown in **Table 6**. Sight distance for the proposed intersection of Cameron Road and Melber Road was only reviewed to determine if there would be any future horizontal sight distance issues that would need to be addressed. However, the existing S-curve that causes limited horizontal sight distance in that area will be removed during the future roadway expansion. Sight distances noted in the table are based on current 2-lane roadway conditions and should be re-evaluated during the Cameron Road design phase.

Table 6 Intersection Sight Distance Analysis

Driveway	Movement	Design Speed (mph)	Recommended Stopping Sight Distance (ft)	Actual Sight Distance (ft)	Sight Distance OK?
Cameron Rd & SE Driveway	Right-turn	55	530'	>1,200'	Yes
	Left-turn		610'	>3,000'	Yes

7.3 AUXILLIARY LANE ANALYSIS

The auxiliary lane analysis considers whether acceleration and/or deceleration lanes (i.e. turn bays) should be built to serve a given driveway. The thresholds for recommending auxiliary lanes are given in Chapter 2 of the City of Pflugerville's engineering design manual and Table 2-3 of TxDOT's *Access Management Manual*; the results of the analysis are shown in **Table 7**. The volumes listed in the table are the greater of those generated during general park use and those generated during special events. Left turn lanes will be required for all median openings. To make a conservative analysis, it will be assumed here that both Cameron Road and Melber Road will have a posted speed limit greater than 45 mph.

Table 7 TxDOT Auxiliary Lane Thresholds

Right Turn to or from Property (>45 mph)				
	Acceleration Lane (based on right-turn egress)	Deceleration Lane (based on right-turn ingress)	**Acceleration Lane Required?**	**Deceleration Lane Required?**
TxDOT Requirement	>200 vph	>50 vph		
SE Driveway & Cameron Rd	30	71	**No**	**Yes**
SW Driveway & Melber Rd	18	83	**No**	**Yes**
Mid. Driveway & Melber Rd	42	0	**No**	**No**
NW Driveway & Melber Rd	160	37	**No**	**No**
NE Driveway & Melber Rd	29	106	**No**	**Yes**

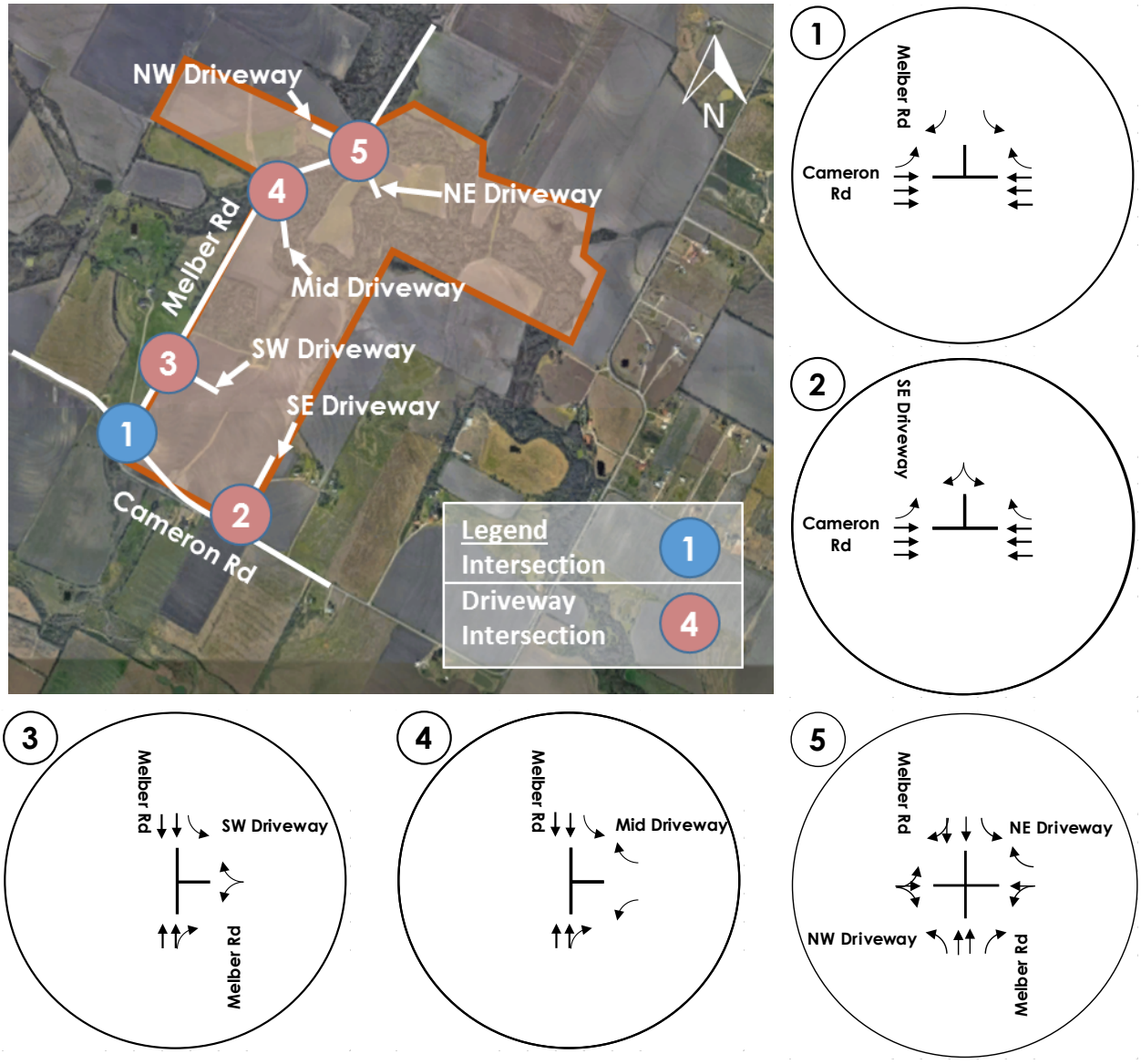
In addition to the right-turn bays shown in **Table 7**, a right-turn bay will be required for the westbound approach of Cameron Road and Melber Road. All right turn bays shall be designed in accordance with City standards.

Because both Cameron Road and Melber Road are expected to be divided roadways, City standards will require left-turn bays for all median cuts. Based on the simulation modeling, the recommended storage bay lengths can be found in **Table 8**. Some of the storage bay lengths have been increased to allow for the storage of two charter busses that could be utilized to move festival patrons from the parking areas to the festival areas, or for high pedestrian activity which could hinder traffic along internal roadways.

Table 8 Proposed Storage Lengths

Intersection	Approach	2030 Build Condition 95th Percentile Queue (ft)	City Minimum Left Turn Storage Length (ft)	Proposed Storage Length (ft)
Cameron Rd & Melber Rd	EB-L	40	100	100
Cameron Rd & SE Driveway	EB-L	20	100	100
	WB-R	--	100	100
Melber Rd & SW Driveway	SB-L	20	100	100
	WB-R	--	100	100
Melber Rd & Mid Driveway	SB-L	20	100	150
	WB-L/R	20	100	100
Melber Rd & NW/NE Driveways	NB-L	20	100	100
	NB-R	-		100
	SB-L	20	100	100
	WB-L/R	60	100	150

Figure 9 Proposed Lane Configurations (2030)



8.0 CONCLUSIONS

The proposed 1849 Park site is expected to be a multi-purpose recreation facility, containing multiple sport facilities, playground areas, open park areas, and an amphitheater. The site is expected to be fully built-out by the year 2030.

With the improvements expected for Cameron Road, the construction of Melber Road, and the anticipated volumes generated by the site — both during normal park use and during special events — delay and queues would not be expected to require further improvements to any of the driveways, or the intersection of Cameron Road and Melber Road. Each of the driveways is expected to be able to operate with one lane entering and one lane exiting the site. However, it's suggested to build a left turn and right turn exit with storage lengths as shown in Table 8.

According to the sight distance analysis for Cameron Road and the southeast driveway, the existing sight distance is sufficient for the Phase 1 driveway. The existing vertical curve between the future intersection of Cameron Road and Melber Road could cause sight distance issues and should be evaluated during the design of Melber Road.

Per TxDOT standards, as described in the *Access Management Manual*, ingress right turn deceleration lanes are proposed for the following driveways:

- Westbound right turn for Cameron Road and Melber Road
- Westbound right turn for Cameron Road and the driveway on the southeast corner of the site
- Northbound right turn for Melber Road and the driveway near the southwest corner of the site
- Northbound right turn for Melber Road and the driveway accessing the northeast portion of the site

Per City standards, left turn bays will be required at all median cuts.

Throughout most of the site, two-lane undivided roadways would be sufficient to handle expected traffic. If the parking lots on the southern side of the site were to be occupied at near-capacity for festivals the roadways could become congested. A four-lane divided roadway could be considered from the driveway's intersection with Melber Road to the internal roadway's intersection with the driveway coming from the southeast corner of the site to relieve the potential traffic. Having a four-lane roadway in this area could also handle bus stops along the roadway as well as the median serving as a refuge area for high pedestrian traffic crossing the roadway.

APPENDIX A: PROPOSED SITE PLAN

Entry Monument
Tennis
Restroom/ Concession
Playground
Parking (550 Spaces)
Entry Monument
Future Street
2.5 Miles to Pfluger ville Lake
100 Yr. Floodplain
Future Fields (Use to be determined based on future needs)
Basketball
Sand Volleyball
Dog Park (5 acres)
Entry Monument
Historical Cemetary
History Center
Open Play & Festival (3.5 Acres)
Parking (300 Spaces)
Sewer Lift Station
Destination Playground (1 acre)
Splash Pad
Restroom/ Pavilion
Amphitheater (2000 Seats)
Maintenance Yard
Pedestrian Bridge
Restroom/ Pavilion
Pedestrian Bridge
100 Yr. Floodplain
Entry Monument
Open Play & Festival (6 Acres)
City Wide Trails Master Plan
Pedestrian Bridge
Parking (200 Spaces)
Playground
Restroom/ Concession
100 Yr. Floodplain
Wildflower & Prairie Preserve
Parking (90 Spaces)
Programmable Outdoor Space (Camping, Archery, Outdoor Learning)
Future Fields (Use to be determined based on future needs)
300' Baseball/ Softball Fields (Smaller Fields Can Be Created w/ Temp. Fencing)
250' BaseBall/ Softball Fields
Restroom/ Concession
Loop Trail
Playground
Future Melber Rd. (120' R.O.W.)
Football Field
Playground
Restroom/ Concession
Championship Field w/ Track & Field Elements
Football Field
Entry Monument
Parking (350 Spaces)
Parking (425 Spaces)
Overhead Electric Lines
Parking (600 Spaces)
Parking (600 Spaces)
Parking (350 Spaces)
Entry Monument
Restroom
Playground
Future City Street
Multi-Purpose Fields (Soccer, Rugby, Lacrosse)
Cameron Rd. (140' R.O.W.)
Entry Monument
NORTH
0 100 200 400 600
GRAPHIC SCALE IN FEET

where quality meets life
PFLUGERVILLE
TEXAS

1849 PARK *Master Plan*

June 2016

Schrickel, Rollins and Associates, Inc.

APPENDIX B: TURNING MOVEMENT COUNTS

Location:	Pecan ST and
Project #:	50875-00
North-South street:	Pecan ST
East-West street:	/ Cameron Rd
Time Period:	9 7:00 AM - 9:00 AM
Date recorded:	Wednesday August 5, 2015
Traffic Count Sub	GRAM Traffic
Path to Raw Data	H:\projects\508\75\00\220 Traffic Impact Analysis\Data\raw\PD-CameronRdPecanSt-AM.xls

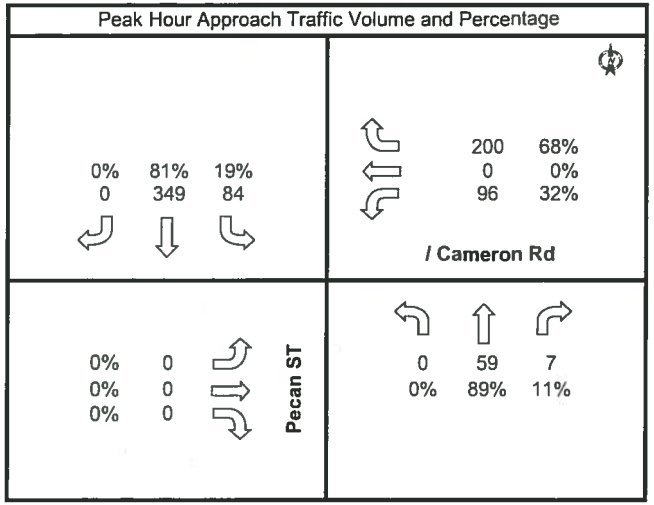
Pape Dawson Engineers, Inc.
2000 NW Loop 410
San Antonio, TX 78213

Time		*Northbound*						*Southbound*						*Eastbound*						*Westbound*					
Movement		*left*		*thru*		*right*		*left*		*thru*		*right*		*left*		*thru*		*right*		*left*		*thru*		*right*	
Vehicle Type		*C*	*T*	*C*	*T*	*C*	*T*	*C*	*T*	*C*	*T*	*C*	*T*	*C*	*T*	*C*	*T*	*C*	*T*	*C*	*T*	*C*	*T*	*C*	*T*
7:00 AM	*7:15 AM*	0		8		1		18		74		0		0		0		0		25		0		49	
7:15 AM	*7:30 AM*	0		13		3		17		106		0		0		0		0		32		0		53	
7:30 AM	*7:45 AM*	0		15		0		20		94		0		0		0		0		20		0		54	
7:45 AM	*8:00 AM*	0		16		1		20		70		0		0		0		0		22		0		52	
8:00 AM	*8:15 AM*	0		15		3		27		79		0		0		0		0		22		0		41	
8:15 AM	*8:30 AM*	0		9		3		17		56		0		0		0		0		8		0		27	
8:30 AM	*8:45 AM*	0		11		1		13		29		0		0		0		0		7		0		34	
8:45 AM	*9:00 AM*	0		8		0		11		27		0		0		0		0		3		0		30	
Total		0	0	95	0	12	0	143	0	535	0	0	0	0	0	0	0	0	0	139	0	0	0	340	0
Peak Movement Total		0		59		7		84		349		0		0		0		0		96		0		200	
Peak Turn Percent		0%		89%		11%		19%		81%		0%		0%		0%		0%		32%		0%		68%	
Peak Approach Total		66						433						0						296					

Peak Hour 7:15 AM - 8:15 AM
Percent Trucks 0%

Time		*Pedestrians*			
	Approach:	*NB*	*SB*	*EB*	*WB*
7:00 AM	*7:15 AM*	0	0	0	0
7:15 AM	*7:30 AM*	0	0	0	0
7:30 AM	*7:45 AM*	0	0	0	0
7:45 AM	*8:00 AM*	0	0	0	0
8:00 AM	*8:15 AM*	0	0	0	0
8:15 AM	*8:30 AM*	0	0	0	0
8:30 AM	*8:45 AM*	0	0	0	0
8:45 AM	*9:00 AM*	0	0	0	0
Total		0	0	0	0
Peak Total		0	0	0	0

Peak Hour Approach Traffic Volume and Percentage



Location:	Pecan St and		
Project #:	50875-00		
North-South street:	Pecan St		
East-West street:	/ Cameron Rd		
Time Period:		45	4:00 PM - 6:00 PM
Date recorded:	Wednesday	August 5, 2015	
Traffic Count Sub	GRAM Traffic		
Path to Raw Data	H:\projects\508\75\00\220 Traffic Impact Analysis\Data\raw\PD-CameronRdPecanSt-PM.xls		

Pape Dawson Engineers, Inc.
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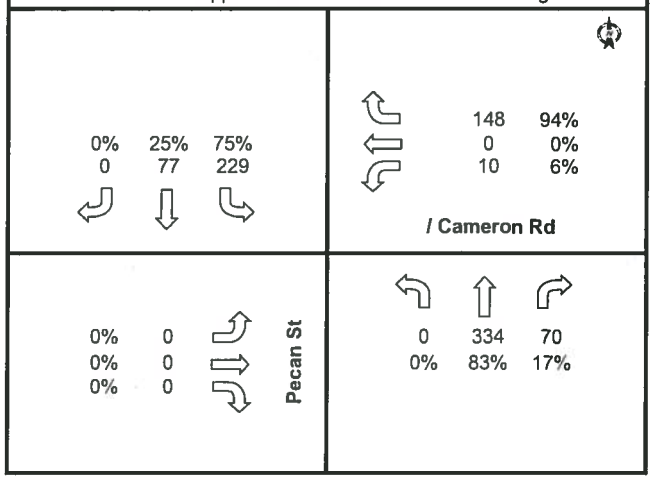
Time		Northbound						Southbound						Eastbound						Westbound					
Movement		left		thru		right		left		thru		right		left		thru		right		left		thru		right	
Vehicle Type		C	T	C	T	C	T	C	T	C	T	C	T	C	T	C	T	C	T	C	T	C	T	C	T
4:00 PM	4:15 PM	0		27		7		35		8		0		0		0		0		2		0		20	
4:15 PM	4:30 PM	0		48		15		41		9		0		0		0		0		2		0		31	
4:30 PM	4:45 PM	0		29		13		45		18		0		0		0		0		0		0		25	
4:45 PM	5:00 PM	0		54		15		49		11		0		0		0		0		4		0		32	
5:00 PM	5:15 PM	0		74		18		38		13		0		0		0		0		2		0		38	
5:15 PM	5:30 PM	0		87		23		67		12		0		0		0		0		1		0		35	
5:30 PM	5:45 PM	0		95		16		67		29		0		0		0		0		5		0		40	
5:45 PM	6:00 PM	0		78		13		57		23		0		0		0		0		2		0		35	
Total		0	0	492	0	120	0	399	0	123	0	0	0	0	0	0	0	0	0	18	0	0	0	256	0
Peak Movement Total		0		334		70		229		77		0		0		0		0		10		0		148	
Peak Turn Percent		0%		83%		17%		75%		25%		0%		0%		0%		0%		6%		0%		94%	
Peak Approach Total		404						306						0						158					

Peak Hour 5:00 PM - 6:00 PM
Percent Trucks 0%

Time		Pedestrians			
	Approach:	NB	SB	EB	WB
4:00 PM	4:15 PM	0	0	0	0
4:15 PM	4:30 PM	0	0	0	0
4:30 PM	4:45 PM	0	0	0	0
4:45 PM	5:00 PM	0	0	0	0
5:00 PM	5:15 PM	0	0	0	0
5:15 PM	5:30 PM	0	0	0	0
5:30 PM	5:45 PM	0	0	0	0
5:45 PM	6:00 PM	0	0	0	0
Total		0	0	0	0
Peak Total		0	0	0	0

Peak Hour Approach Traffic Volume and Percentage



Location:	Fuchs Grove Rd and Cameron Rd		
Project #:	50875-00		
North-South street:	Fuchs Grove Rd		
East-West street:	Cameron Rd /		
Time Period:		9	7:00 AM - 9:00 AM
Date recorded:	Wednesday	August 5, 2015	
Traffic Count Sub	GRAM Traffic		
Path to Raw Data	H:\projects\508\75\00\220 Traffic Impact Analysis\Data\raw\PD-CameronRdFuchsGroveRd-AM.x		

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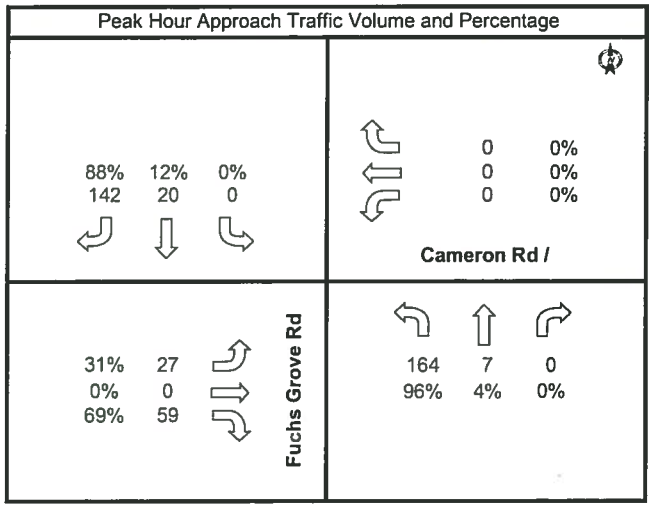
Time		*Northbound*						*Southbound*						*Eastbound*						*Westbound*					
Movement		*left*		*thru*		*right*		*left*		*thru*		*right*		*left*		*thru*		*right*		*left*		*thru*		*right*	
Vehicle Type		*C*	*T*	*C*	*T*	*C*	*T*	*C*	*T*	*C*	*T*	*C*	*T*	*C*	*T*	*C*	*T*	*C*	*T*	*C*	*T*	*C*	*T*	*C*	*T*
7:00 AM	*7:15 AM*	39		2		0		0		5		44		5		0		17		0		0		0	
7:15 AM	*7:30 AM*	47		2		0		0		5		36		9		0		13		0		0		0	
7:30 AM	*7:45 AM*	45		1		0		0		6		32		2		0		15		0		0		0	
7:45 AM	*8:00 AM*	33		2		0		0		4		30		11		0		14		0		0		0	
8:00 AM	*8:15 AM*	29		0		0		0		4		28		10		0		20		0		0		0	
8:15 AM	*8:30 AM*	22		1		0		0		4		13		5		0		11		0		0		0	
8:30 AM	*8:45 AM*	20		2		0		0		1		12		7		0		9		0		0		0	
8:45 AM	*9:00 AM*	20		1		0		0		5		13		4		0		7		0		0		0	
Total		255	0	11	0	0	0	0	0	34	0	208	0	53	0	0	0	106	0	0	0	0	0	0	0
Peak Movement Total		164		7		0		0		20		142		27		0		59		0		0		0	
Peak Turn Percent		96%		4%		0%		0%		12%		88%		31%		0%		69%		0%		0%		0%	
Peak Approach Total		171						162						86						0					

Peak Hour 7:00 AM - 8:00 AM
Percent Trucks 0%

Time		*Pedestrians*			
	Approach:	*NB*	*SB*	*EB*	*WB*
7:00 AM	*7:15 AM*	0	0	0	0
7:15 AM	*7:30 AM*	0	0	0	0
7:30 AM	*7:45 AM*	0	0	0	0
7:45 AM	*8:00 AM*	0	0	0	0
8:00 AM	*8:15 AM*	0	0	0	0
8:15 AM	*8:30 AM*	0	0	0	0
8:30 AM	*8:45 AM*	0	0	0	0
8:45 AM	*9:00 AM*	0	0	0	0
Total		0	0	0	0
Peak Total		0	0	0	0

Peak Hour Approach Traffic Volume and Percentage



Location:	Fuchs Grove Rd and Cameron Rd		
Project #:	50875-00		
North-South street:	Fuchs Grove Rd		
East-West street:	Cameron Rd /		
Time Period:		45	4:00 PM - 6:00 PM
Date recorded:	Wednesday	August 5, 2015	
Traffic Count Sub	GRAM Traffic		
Path to Raw Data	H:\projects\508\75\00\220 Traffic Impact Analysis\Data\raw\PD-CameronRdFuchsGroveRd-PM.x		

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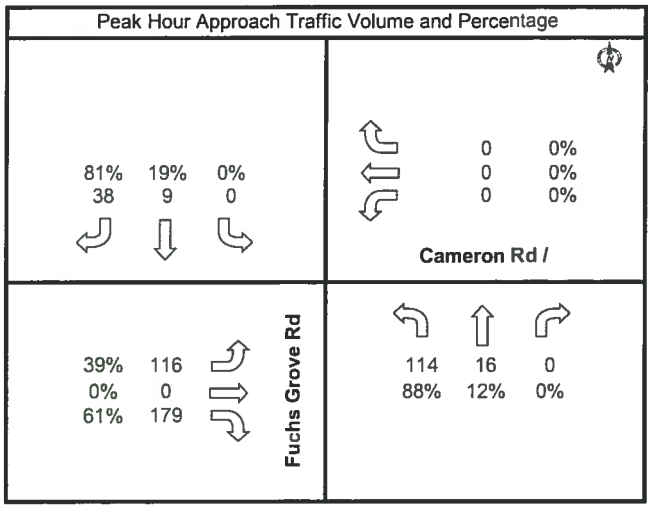
2000 NW Loop 410
San Antonio, TX 78213

Time		*Northbound*						*Southbound*						*Eastbound*						*Westbound*					
Movement		*left*		*thru*		*right*		*left*		*thru*		*right*		*left*		*thru*		*right*		*left*		*thru*		*right*	
Vehicle Type		*C*	*T*	*C*	*T*	*C*	*T*	*C*	*T*	*C*	*T*	*C*	*T*	*C*	*T*	*C*	*T*	*C*	*T*	*C*	*T*	*C*	*T*	*C*	*T*
4:00 PM	*4:15 PM*	19		3		0		0		2		5		20		0		22		0		0		0	
4:15 PM	*4:30 PM*	22		4		0		0		0		11		25		0		33		0		0		0	
4:30 PM	*4:45 PM*	22		4		0		0		1		8		25		0		36		0		0		0	
4:45 PM	*5:00 PM*	24		4		0		0		1		15		25		0		37		0		0		0	
5:00 PM	*5:15 PM*	22		5		0		0		1		9		30		0		29		0		0		0	
5:15 PM	*5:30 PM*	32		3		0		0		3		10		39		0		49		0		0		0	
5:30 PM	*5:45 PM*	34		4		0		0		3		8		25		0		58		0		0		0	
5:45 PM	*6:00 PM*	26		4		0		0		2		11		22		0		43		0		0		0	
Total		201	0	31	0	0	0	0	0	13	0	77	0	211	0	0	0	307	0	0	0	0	0	0	0
Peak Movement Total		114		16		0		0		9		38		116		0		179		0		0		0	
Peak Turn Percent		88%		12%		0%		0%		19%		81%		39%		0%		61%		0%		0%		0%	
Peak Approach Total		130						47						295						0					

Peak Hour 5:00 PM - 6:00 PM
Percent Trucks 0%

Time		*Pedestrians*			
	Approach:	*NB*	*SB*	*EB*	*WB*
4:00 PM	*4:15 PM*	0	0	0	0
4:15 PM	*4:30 PM*	0	0	0	0
4:30 PM	*4:45 PM*	0	0	0	0
4:45 PM	*5:00 PM*	0	0	0	0
5:00 PM	*5:15 PM*	0	0	0	0
5:15 PM	*5:30 PM*	0	0	0	0
5:30 PM	*5:45 PM*	0	0	0	0
5:45 PM	*6:00 PM*	0	0	0	0
Total		0	0	0	0
Peak Total		0	0	0	0

Peak Hour Approach Traffic Volume and Percentage



APPENDIX C: SYNCHRO REPORTS

Intersection	
Int Delay, s/veh	7.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	254	407	211	106	105	288
Future Vol, veh/h	254	407	211	106	105	288
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	75	-	-	75	-	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	276	442	229	115	114	313

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	229	0	-	0	958	115
Stage 1	-	-	-	-	229	-
Stage 2	-	-	-	-	729	-
Critical Hdwy	5.34	-	-	-	5.74	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	3.12	-	-	-	3.82	3.92
Pot Cap-1 Maneuver	906	-	-	-	326	778
Stage 1	-	-	-	-	696	-
Stage 2	-	-	-	-	398	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	906	-	-	-	227	778
Mov Cap-2 Maneuver	-	-	-	-	227	-
Stage 1	-	-	-	-	696	-
Stage 2	-	-	-	-	277	-

Approach	EB	WB	SB
HCM Control Delay, s	4.1	0	18.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	906	-	-	-	227	778
HCM Lane V/C Ratio	0.305	-	-	-	0.503	0.402
HCM Control Delay (s)	10.7	-	-	-	35.9	12.7
HCM Lane LOS	B	-	-	-	E	B
HCM 95th %tile Q(veh)	1.3	-	-	-	2.6	2

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	35	477	287	71	89	30
Future Vol, veh/h	35	477	287	71	89	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	75	-	-	-	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	38	518	312	77	97	33

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	389	0	-	0	634	195
Stage 1	-	-	-	-	351	-
Stage 2	-	-	-	-	283	-
Critical Hdwy	5.34	-	-	-	5.74	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	3.12	-	-	-	3.82	3.92
Pot Cap-1 Maneuver	763	-	-	-	471	692
Stage 1	-	-	-	-	591	-
Stage 2	-	-	-	-	679	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	763	-	-	-	448	692
Mov Cap-2 Maneuver	-	-	-	-	448	-
Stage 1	-	-	-	-	591	-
Stage 2	-	-	-	-	645	-

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	14.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	763	-	-	-	492
HCM Lane V/C Ratio	0.05	-	-	-	0.263
HCM Control Delay (s)	10	-	-	-	14.9
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	1

Intersection	
Int Delay, s/veh	2.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	119	18	277	83	14	274
Future Vol, veh/h	119	18	277	83	14	274
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	-	-	-	75	-
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	129	20	301	90	15	298

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	525	196	0	0	391	0
Stage 1	346	-	-	-	-	-
Stage 2	179	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	482	812	-	-	1164	-
Stage 1	688	-	-	-	-	-
Stage 2	834	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	476	812	-	-	1164	-
Mov Cap-2 Maneuver	476	-	-	-	-	-
Stage 1	688	-	-	-	-	-
Stage 2	823	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.1	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	503	1164	-
HCM Lane V/C Ratio	-	-	0.296	0.013	-
HCM Control Delay (s)	-	-	15.1	8.1	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	1.2	0	-

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	42	295	0	33	288
Future Vol, veh/h	0	42	295	0	33	288
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	-	-	-	75	-
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	46	321	0	36	313

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	549	160	0	0	321	0
Stage 1	321	-	-	-	-	-
Stage 2	228	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	466	857	-	-	1236	-
Stage 1	708	-	-	-	-	-
Stage 2	788	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	452	857	-	-	1236	-
Mov Cap-2 Maneuver	452	-	-	-	-	-
Stage 1	708	-	-	-	-	-
Stage 2	765	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	857	1236	-
HCM Lane V/C Ratio	-	-	0.053	0.029	-
HCM Control Delay (s)	-	-	9.4	8	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	0	95	72	0	18	98	167	72	18	154	24
Future Vol, veh/h	24	0	95	72	0	18	98	167	72	18	154	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	26	0	103	78	0	20	107	182	78	20	167	26

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	524	693	97	557	667	130	193	0	0	260	0	0
Stage 1	220	220	-	434	434	-	-	-	-	-	-	-
Stage 2	304	473	-	123	233	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	436	365	940	413	378	896	1378	-	-	1302	-	-
Stage 1	762	720	-	570	579	-	-	-	-	-	-	-
Stage 2	681	557	-	868	711	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	397	331	940	342	343	896	1378	-	-	1302	-	-
Mov Cap-2 Maneuver	397	331	-	342	343	-	-	-	-	-	-	-
Stage 1	703	709	-	526	534	-	-	-	-	-	-	-
Stage 2	614	514	-	761	700	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.9	17.3	2.3	0.7
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1378	-	-	737	390	1302	-	-
HCM Lane V/C Ratio	0.077	-	-	0.176	0.251	0.015	-	-
HCM Control Delay (s)	7.8	-	-	10.9	17.3	7.8	-	-
HCM Lane LOS	A	-	-	B	C	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	0.6	1	0	-	-

Intersection	
Int Delay, s/veh	14.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	298	404	204	138	145	327
Future Vol, veh/h	298	404	204	138	145	327
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	75	-	-	75	-	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	324	439	222	150	158	355

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	222	0	-	0	1045	111
Stage 1	-	-	-	-	222	-
Stage 2	-	-	-	-	823	-
Critical Hdwy	5.34	-	-	-	6.44	7.14
Critical Hdwy Stg 1	-	-	-	-	7.34	-
Critical Hdwy Stg 2	-	-	-	-	6.74	-
Follow-up Hdwy	3.12	-	-	-	3.82	3.92
Pot Cap-1 Maneuver	913	-	-	-	241	782
Stage 1	-	-	-	-	673	-
Stage 2	-	-	-	-	303	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	913	-	-	-	175	782
Mov Cap-2 Maneuver	-	-	-	-	175	-
Stage 1	-	-	-	-	434	-
Stage 2	-	-	-	-	195	-

Approach	EB	WB	SB
HCM Control Delay, s	4.7	0	39.1
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	913	-	-	-	175	782
HCM Lane V/C Ratio	0.355	-	-	-	0.901	0.455
HCM Control Delay (s)	11.1	-	-	-	97.2	13.4
HCM Lane LOS	B	-	-	-	F	B
HCM 95th %tile Q(veh)	1.6	-	-	-	6.7	2.4

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	32	517	319	63	69	23
Future Vol, veh/h	32	517	319	63	69	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	75	-	-	-	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	35	562	347	68	75	25

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	415	0	-	0	675	208
Stage 1	-	-	-	-	381	-
Stage 2	-	-	-	-	294	-
Critical Hdwy	5.34	-	-	-	5.74	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	3.12	-	-	-	3.82	3.92
Pot Cap-1 Maneuver	742	-	-	-	450	679
Stage 1	-	-	-	-	567	-
Stage 2	-	-	-	-	670	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	742	-	-	-	429	679
Mov Cap-2 Maneuver	-	-	-	-	429	-
Stage 1	-	-	-	-	567	-
Stage 2	-	-	-	-	638	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	14.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	742	-	-	-	472
HCM Lane V/C Ratio	0.047	-	-	-	0.212
HCM Control Delay (s)	10.1	-	-	-	14.7
HCM Lane LOS	B	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.8

Intersection	
Int Delay, s/veh	2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	91	14	362	74	13	381
Future Vol, veh/h	91	14	362	74	13	381
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	-	-	-	75	-
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	99	15	393	80	14	414

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	669	237	0	0	474	0
Stage 1	434	-	-	-	-	-
Stage 2	235	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	391	764	-	-	1084	-
Stage 1	621	-	-	-	-	-
Stage 2	782	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	386	764	-	-	1084	-
Mov Cap-2 Maneuver	386	-	-	-	-	-
Stage 1	621	-	-	-	-	-
Stage 2	772	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	413	1084	-
HCM Lane V/C Ratio	-	-	0.276	0.013	-
HCM Control Delay (s)	-	-	17	8.4	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	1.1	0	-

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	32	376	0	29	394
Future Vol, veh/h	0	32	376	0	29	394
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	-	-	-	75	-
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	35	409	0	32	428

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	686	204	0	0	409	0
Stage 1	409	-	-	-	-	-
Stage 2	277	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	381	803	-	-	1146	-
Stage 1	639	-	-	-	-	-
Stage 2	745	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	370	803	-	-	1146	-
Mov Cap-2 Maneuver	370	-	-	-	-	-
Stage 1	639	-	-	-	-	-
Stage 2	724	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.7	0	0.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	803	1146	-
HCM Lane V/C Ratio	-	-	0.043	0.028	-
HCM Control Delay (s)	-	-	9.7	8.2	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Intersection	
Int Delay, s/veh	8.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	0	160	114	0	29	149	153	106	26	149	37
Future Vol, veh/h	40	0	160	114	0	29	149	153	106	26	149	37
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	43	0	174	124	0	32	162	166	115	28	162	40

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	646	844	101	686	807	141	202	0	0	282	0	0
Stage 1	239	239	-	548	548	-	-	-	-	-	-	-
Stage 2	407	605	-	138	259	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	357	298	935	334	314	881	1367	-	-	1277	-	-
Stage 1	743	706	-	488	515	-	-	-	-	-	-	-
Stage 2	592	486	-	851	692	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	308	257	935	243	271	881	1367	-	-	1277	-	-
Mov Cap-2 Maneuver	308	257	-	243	271	-	-	-	-	-	-	-
Stage 1	655	691	-	430	454	-	-	-	-	-	-	-
Stage 2	503	428	-	678	677	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13	31.8	2.9	1
HCM LOS	B	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1367	-	-	664	285	1277	-	-
HCM Lane V/C Ratio	0.118	-	-	0.327	0.545	0.022	-	-
HCM Control Delay (s)	8	-	-	13	31.8	7.9	-	-
HCM Lane LOS	A	-	-	B	D	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	1.4	3	0.1	-	-