IBI GROUP
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Memorandum

To/Attention	Placeworks	**Date**	Oct 5, 2021
From	Mike Arizabal, IBI Group	**Project No**	134992
cc			
Subject	St. Anthony Athletic Complex Parking and Circulation Analysis		

IBI Group has prepared a trip generation and parking demand analysis for the proposed St. Anthony High School Master Plan, located at 4800 Clark Avenue in Long Beach, California. The memorandum addresses any parking and circulation impacts associated the proposed field improvement project.

The project scope involves improvements to the football and track field. St. Anthony currently uses portable bleachers to host spectators at its field events. It is understood that it hosts events using 1,200 bleacher seats, which is the same as proposed for permanent bleachers. As such, the proposed project is not anticipated to introduce any new traffic to the adjacent street system and a full traffic analysis is not required. The High School plans to maintain the current Archdioceses of Long Beach joint use parking agreement for major events with the St. Cyprian Church and School site, located immediately adjacent to the project site. On-street parking is also available adjacent to the site and at Pan American Park.

The analysis below identifies any potential impacts to parking and/or on-site circulation (access into and out of the project driveways), consistent with City of Long Beach impact analysis guidelines.

PROJECT DESCRIPTION

St. Anthony High School proposes improvements to the 9.6-acre Athletic Complex at 4800 Clark Avenue. The field is bounded by Del Amo Boulevard to the north, Clark Avenue to the west, Arbor Road to the south, and a storm drain channel to the east. The High School campus is eight miles away at 620 Olive Avenue, Long Beach. St. Anthony has developed a 20-year, long-range development plan that includes improvements to the football field in a first phase and potential improvements to the shared baseball and softball fields in a future phase. St. Anthony has not finalized plans for improvements to the baseball/softball fields and therefore the analysis is focused only on the improvements within the zone shown as the project area on the site plan.

St. Anthony currently uses portable bleachers to host spectators at its field events. It is understood that it hosts events of using 1,200 bleacher seats, same as proposed for permanent bleachers. It is understood that St. Anthony has an agreement for off-site parking at the adjacent St. Cyprian Church and School site.

The field improvements include the following:

- Combined Football, Soccer, Lacrosse Field
    - Synthetic turf field
    - Permanent stadium seating for 1,200 spectators (no increase in capacity from portable rental units)
    - Press box with PA, scoreboard controls, camera platform
    - PA system, elevated from back of grandstands
    - Scoreboard
    - 4-pole, 80- to 90-foot-tall LED lighting
    - Stormwater system
- 400-Meter, 6-Lane, All-Weather Track
    - Rubberized truck surface
    - Long/triple jump runways
    - Pole vault/high jump areas
    - Shotput/discus areas
- Parking and Driveway Improvements
- Fencing
- Site Landscaping
- Team Building (locker rooms, restrooms, training, coaches, officials, multipurpose, storage, etc.)
- Restroom/Ticketing Building
- Storage Building and Waste Recycling Holding Area

EXISTING FIELD OPERATIONS, PARKING AND CIRCULATION

Observations of the project site were conducted via Google Maps to identify existing access points, circulation patterns and parking. The field's only two access points are located along Clark Avenue between Del Amo Boulevard and Arbor Road. Vehicles and buses enter the southernmost driveway and exit via the northern driveway.

The field currently provides 114 spaces via on-site surface lots. The existing project boundary, circulation pattern, parking areas, and access locations are illustrated in Figure 1 below.

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FIGURE 1: EXISTING ACCESS, PARKING AND CIRCULATION

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PROPOSED PROJECT

The Phase 1 football field improvements will provide 1,200 permanent bleacher seats, which is unchanged from the number of seats in the existing condition. The proposed circulation plan will also remain unchanged from the existing condition, where ingress will occur via the southern driveway and egress through the northern driveway. The surface lot will be modified to maintain 27 existing spaces[1] and provide 94 new parking spaces (total 121 spaces), for a net increase of 7 spaces from the 114-space existing condition. Overflow parking for capacity events will continue to be provided via the joint parking agreement with St. Cyprian Church and School, located immediately south of the project site. The Future with Project Site Plan and Circulation Map is shown below in Figure 2.

PROJECT TRIP GENERATION

The sports, field and recreational land use categories are not currently listed in the Institute of Transportation Engineers (ITE) Trip Generation Manual, and there is limited local or national survey data available for this type of use. High school sporting venues typically do not generate a significant number of vehicle trips during the peak hours of adjacent street traffic, but volumes may vary depending on the type of event and the scheduled start time. Daily trip generation for this type of special event land use is highly variable and depends on a number of local factors including demographics, weather patterns, team performance, and other site-specific criteria. Sports team practices and activities that take place on the field are already generating vehicle trips to the site. No new trips to and from the athletic complex are anticipated as the number of seats is proposed to remain the same as the existing condition (1,200 bleacher seats).

Since the field use would occur during the weekday evenings, IBI Group will only develop PM peak hour and daily vehicle trip generation estimates. In the absence of a trip generation rate from the ITE Trip Generation Manual, traffic studies for other high school projects (based on number of bleacher seats) and other jurisdictions were used to develop a reasonable trip generation estimate for the St. Anthony Athletic Complex project.

Those other studies include University High School, Corona Del Mar High School and Costa Mesa High School Stadium traffic studies, which used actual driveway counts for a high school football game between Estancia High School and Costa Mesa High School. These studies showed a daily trip generation rate of 0.47/seat and a peak hour trip generation of 0.20/seat during full capacity events (all bleacher seats full) during popular games such as the Homecoming football game.

The San Diego Association of Governments (SANDAG) *Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region* (April 2002) publishes a 0.20/seat peak hour rate for Sports Facilities (Outdoor Stadiums), which is consistent with the previous traffic studies.

The trip generation from previous studies and the rates published from SANDAG are included in Appendix A. The trip generation is summarized in Table 1 below.

[1] The 27 existing spaces are subject to redesign and/or removal in a future phase of development.

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FIGURE 2: FUTURE PROJECT SITE PLAN

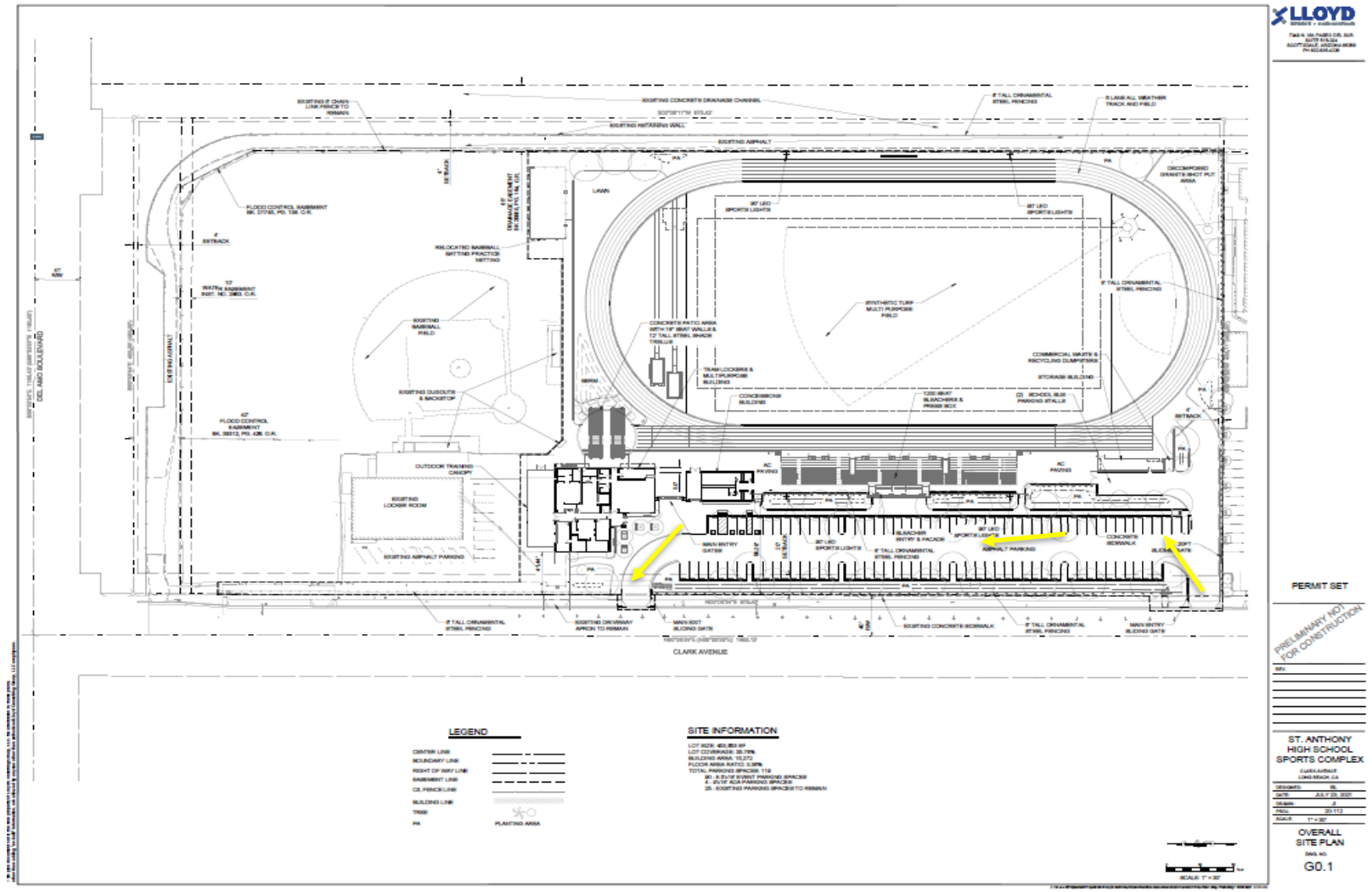

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TABLE 1: ST. ANTHONY ATHLETIC COMPLEX TRIP GENERATION

			P.M. Peak Hour		
	Unit	ADT	In	Out	Total
Trip Rate[1]					
High School Athletic Complex	Seats	0.47	0.19	0.01	0.20
Project Trip Generation	**Size**				
St. Anthony HS Athletic Complex	1,200	564	228	12	240

[1]Trip rates referenced from three similar high school athletic field traffic studies, with bleacher seats as the unit.

As shown in the table, the project would generate approximately 564 daily trips and 240 PM peak hour trips (228 in and 12 out) assuming a full capacity event.

PROJECT TRIP DISTRIBUTION

Travel patterns to the athletic field were determined based on discussions with school staff regarding attendance areas for the St. Anthony High School, with the majority originating from south of the I-405 Freeway. Approximately 85 percent of visitors during events at the athletic complex would come from south of the project site via Lakewood Boulevard, Clark Avenue, Bellflower Boulevard and Carson Street. The remaining 15 percent would come from the north via Lakewood Boulevard, Clark Avenue, and Bellflower Boulevard or east and west via Del Amo Boulevard. The trip distribution, confirmed with school staff, is shown in Figure 3.

PARKING DEMAND GENERATION AND ANALYSIS

The High School athletic complex land use is not included in the Institute of Transportation Engineers (ITE) Parking Generation report. In the absence of national statistical parking rates, parking demand for the St. Anthony Athletic Complex project was estimated using occupancy count data included in the University High School Stadium Project Traffic Impact Analysis Report (January 2008) prepared by IBI Group. The observed peak parking demand rate for a high school Homecoming Varsity football game was about 0.23 spaces per seat, which represents a maximum capacity event that would occur during special events or home football games (up to 10 events per year.

The proposed St. Anthony High School Athletic Complex is expected to have 1,200 seats, so peak parking demand is estimated to be 276 parking spaces. There will be approximately 27 existing spaces[2] maintained (25 regular and 2 accessible spaces), 94 striped parking spaces (90 standard and 4 accessible spaces) and two bus parking spaces provided on-site once construction is complete. Each bus is anticipated to transport both teams' players and coaches (48 people per bus, or 96 total people). The buses would be the equivalent for 22 parked cars. During typical and capacity events, the 143 spaces on-site (27 existing spaces, 90 regular spaces, 4 accessible spaces and 22 equivalent bus spaces) would result in a parking deficiency of approximately 133 spaces. It should be noted that although there are 117 striped on-street parking spaces on Clark Avenue and Arbor Avenue available for use during an event, those parking spaces cannot be counted towards the parking requirement for the fields.

[2] The 27 existing spaces are subject to redesign and/or removal in a future phase of development.

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FIGURE 3: TRIP DISTRIBUTION DURING CAPACITY EVENTS AT ATHLETIC COMPLEX

It is understood that the St. Anthony Field has an agreement in place for overflow conditions. To address the 133-space parking shortfall on-site, St. Anthony would be required to maintain the off-site parking agreement at the adjacent St. Cyprian Church and School, located immediately south of the athletic field. St. Cyprian Church and School has a total of 169 spaces (165 regular and 4 accessible spaces) for use during St. Anthony Field events, which absorbs the 133-space shortfall. Figure 4 shows the location of the overflow lots.

TABLE 2: ON-SITE AND OVERFLOW PARKING PROVISION

On-Site Parking Provision	**Spaces**
Parking Spaces Required	276
St. Anthony Existing Spaces Remaining[3]	27
St. Anthony New Spaces Provided	94
Bus Parking Space Equivalent	22
On-Site Parking Shortfall[4]	*160*
Overflow Parking Lot	
St. Cyprian Church and School	169

PEDESTRIAN CIRCULATION ANALYSIS

Detailed plans for the proposed athletic complex show lighted and landscaped pathways will be provided from the St. Anthony and St. Cyprian parking lots to the main athletic complex entry and exit points. New lighted pedestrian pathways will also provide access to the restrooms and bleacher seats. The existing pedestrian facilities on and surrounding the field and overflow lot adequately serve the intended use. No pedestrian circulation issues are identified at this time, and no further improvements are required.

For added safety, the school should provide visitors with detailed information regarding parking at the field and at the adjoining St. Cyprian Church and School. Information should include a map showing pedestrian to and from the overflow lot(s) and the location of the overflow lot(s), as well as provision of trained crossing guards and/or traffic flaggers during events. As the project will not increase the number of bleacher seats from the existing condition, no increase in pedestrian activity related to the athletic complex improvements is anticipated. The number of seats, and therefore the number of people, remains unchanged from the existing condition. As the location of the athletic complex parking lot and the overflow lot at St. Cyprian will remain unchanged, no increases in pedestrian activity is anticipated from what is currently occurring. Both lots can accommodate all parking requirements associated with the athletic complex and therefore an increase in pedestrian activity outside of these two lots are not anticipated.

[3] These spaces are subject to removal at a later phase
[4] The 27 spaces, subject to removal at a later phase, are not counted towards the proposed parking supply.

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FIGURE 4: OVERFLOW LOT

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VEHICULAR CIRCULATION ANALYSIS

The proposed ingress and egress locations will remain unchanged from the existing condition, with ingress via the southern driveway and egress through the northern driveway. The northern driveway will serve as the main egress point (left and right-tun out only) while the southern driveway will be the primary ingress point (left and right-turn in only).

AM and PM peak hour traffic counts were collected at the primary intersections leading to or from the athletic complex and are included in Appendix B. A level of service (LOS) analysis was conducted at the three primary intersections leading to or from the field site during events. The LOS analysis includes the existing and the existing with the project (event traffic) condition. The project-generated trips were assigned to each of the three intersections using the percentages shown Figure 3 and added to the existing traffic volumes.

As shown in Figure 3, most trips originate from locations south the project site, confirmed with school staff. The majority of trips are anticipated to come from the east and west sides of Long Beach, Signal Hill, around the Cal State Long Beach campus, and Downtown Long Beach reflecting the student capture areas for the St. Anthony High School. The three intersections analyzed were:

1. Del Amo Boulevard/Clark Avenue
2. Arbor Road/Clark Avenue
3. Arbor Road/Charlemagne Avenue

Table 3 below summarizes the results of the PM peak hour LOS analysis for the existing condition, with and without the athletic complex-related traffic. It should be noted that high school football games typically start at 7:00PM, so only a portion of the athletic complex-related traffic would occur during the PM peak hour (PM peak period occurs between 4PM and 6PM). However, to provide a conservative analysis, the full project trip generation was assumed to occur during the PM peak hour.

TABLE 3: ST. ANTHONY FIELD TRIP GENERATION

ID	Intersection	Traffic Control	Existing PM Peak Hour		Existing PM with Event Traffic	
			Delay	LOS	Delay	LOS
1	Clark Ave & Del Amo Blvd	Signal	30.0	C	30.6	C
2	Clark Ave & E Arbor Rd	Signal	6.4	A	9.3	A
3	E Arbor Rod & Charlemagne Ave	TWSC	9.4	A	9.7	A

As shown in Table 3, all intersections are anticipated to operate at acceptable LOS during existing and existing with project conditions. The LOS worksheets are included in Appendix C.

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CONCLUSIONS

The proposed athletic complex improvements at the St. Anthony High School Field would not result in an increase in trips beyond what exists today for full capacity events such as high school football games (564 daily trips and 240 PM peak hour trips).

The proposed site plan provides a total of 121 parking spaces (27 existing spaces and 94 new spaces) and two bus spaces. The buses carry approximately 48 people per bus, which is the equivalent of 22 parking spaces. The proposed St. Anthony High School athletic complex is expected to have 1,200 seats, so peak parking demand is estimated to be 276 parking spaces. During capacity events, the 116 spaces on-site (94 spaces and 22 equivalent bus spaces) would result in a parking deficiency of approximately 160 spaces.

It is understood that the St. Anthony athletic complex has an agreement in place for overflow conditions. To address the 160-space parking shortfall on-site, St. Anthony would be required to maintain the off-site parking agreement at the St. Cyprian Church and School, located immediately to the south of the project site. St. Cyprian provides a total of 169 marked spaces, all of which will be available for use during a capacity event at St. Anthony athletic complex. As such, this primary overflow lot would be able to accommodate all of the 133 spaces needed. Pan American Park, located a quarter of a mile away from the athletic complex, although not anticipated to be needed is also available for overflow conditions.

The existing pedestrian facilities on and surrounding the field and overflow lot adequately serve the athletic complex use. No increase in pedestrian activity is anticipated with the project, as the project does not increase the number of bleacher seats from the existing condition. No pedestrian circulation issues are identified at this time, and no mitigation measures are required. On-street parking on both sides of Clark Avenue and Arbor Road will continue to be available for athletic complex-related events. Vehicles parking on the west side of Clark Avenue should be directed to utilize the existing crosswalks at Del Amo Boulevard or Arbor Road.

For added safety, the school should provide visitors with detailed information regarding parking at the field and at St. Cyprian Church and School. Information should include a map showing pedestrian routes to and from the overflow lot at St. Cyprian Church and School and the location of the overflow lot. Trained crossing guards and/or traffic flaggers are also recommended for added safety during events.

No increase in bleacher seats are proposed with the improvements to the football field. However, a trip generation study was conducted to identify any potential impacts to intersections as a result of athletic complex event traffic. The vehicular circulation analysis showed that the LOS during full capacity events at the three study area intersections would not be impacted by the traffic associated with the athletic complex use.

In conclusion, the proposed athletic complex improvement project can be implemented with no significant impacts to parking, circulation, or traffic. Simply extending the joint use parking agreement with the adjacent St. Cyprian Church and School – also a part of the Archdiocese of Los Angeles, coupled with maintaining the use of the nearby overflow parking zone for the maximum 10 full capacity events per year will further improve the flow of vehicles and pedestrians to and from the renovated athletic complex.

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APPENDIX A: TRIP GENERATION REFERENCES

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SANDAG TRIP RATES

(NOT SO)
BRIEF GUIDE OF VEHICULAR TRAFFIC GENERATION RATES FOR THE SAN DIEGO REGION

APRIL 2002

SANDAG
401 B Street, Suite 800
San Diego, California 92101
(619) 699-1900 • Fax (619) 699-1950

NOTE: This listing only represents a ***guide*** of average, or estimated, traffic generation "driveway" rates and some very general trip data for land uses (emphasis on acreage and building square footage) in the San Diego region. These rates (both local and national) are subject to change as future documentation becomes available, or as regional sources are updated. For more specific information regarding traffic data and trip rates, please refer to the San Diego Traffic Generators manual. ***Always check with local jurisdictions for their preferred or applicable rates.***

LAND USE	TRIP CATEGORIES [PRIMARY:DIVERTED:PASS-BY][P]	ESTIMATED WEEKDAY VEHICLE TRIP GENERATION RATE (DRIVEWAY)	HIGHEST PEAK HOUR % (plus IN:OUT ratio) Between 6:00-9:30 A.M.	Between 3:00-6:30 P.M.	TRIP LENGTH (Miles)[L]
RECREATION					
Beach, Ocean or Bay	[52:39:9]	600/1000 ft. shoreline, 60/acre*			6.3
Beach, Lake (fresh water)		50/1000 ft. shoreline, 5/acre*			
Bowling Center		30/1000 sq. ft., 300/acre, 30/lane **	7% (7:3)	11% (4:6)	
Campground		4/campsite**	4%	8%	
Golf Course		7/acre, 40/hole, 700/course* **	7% (8:2)	9% (3:7)	
Driving Range only		70/acre, 14/tee box*	3% (7:3)	9% (5:5)	
Marinas		4/berth, 20/acre* **	3% (3:7)	7% (6:4)	
Multi-purpose (miniature golf, video arcade, batting cage, etc.)		90/acre	2%	6%	
Racquetball/Health Club		30/1000 sq. ft., 300/acre, 40/court*	4% (6:4)	9% (6:4)	
Tennis Courts		16/acre, 30/court**	5%	11% (5:5)	
Sports Facilities					
Outdoor Stadium		50/acre, 0.2/seat*			
Indoor Arena		30/acre, 0.1/seat*			
Racetrack		40/acre, 0.6 seat*			
Theaters (multiplex w/matinee)	[66:17:17]	80/1000 sq. ft., 1.8/seat, 360/screen*	1/3%	8% (6:4)	6.1

IRVINE UNIFIED SCHOOL DISTRICT HIGH SCHOOL NO. 5 TRAFFIC IMPACT ANALYSIS REPORT (IBI GROUP, SEPTEMBER 2013)

8.4.1 Stadium Trip Generation

The stadium land use category is not currently listed in the Institute of Transportation Engineers (ITE) Trip Generation Manual, and there is limited local or national survey data available for this type of use. High school stadiums typically do not generate a significant number of vehicle trips during the peak hours of adjacent street traffic, but volumes may vary depending on the type of event and the scheduled start time. Stadium uses that would not attract large numbers of spectators are not expected to generate any additional trips. Vehicle trips generated by sports team practices and activities that take place on the track and football field are already captured in the standard trip generation for the high school. The only additional trips that are expected to be generated by the stadium would be for events with a significant volume of spectators seated in the bleachers.

High school stadium activities that attract large numbers of spectators tend to be seasonal, and include football games, graduation ceremonies, and occasional community events. Varsity football games are typically scheduled for Thursday, Friday, or Saturday evenings between late August and early December.

It is expected that the daily and peak hour trip generation for the proposed High School No. 5 will be similar to the trip generation at Irvine Stadium. Driveway counts were made at Irvine Stadium in an attempt to identify the number of vehicle trips that enter and exit the stadium site during a typical stadium event. Varsity football games with attendance at stadium capacity are forecast to generate a total of 605 evening peak hour trips (430 inbound and 175 outbound). This value is based on driveway volumes observed at Irvine Stadium and Institute of Transportation Engineers (ITE) *Trip Generation* rates for Heritage Park.

Evening peak hour trips are not expected to occur on typical weekdays. As a worst case scenario, the number of forecast project-related trips for a stadium event where every bleacher seat is filled is added to the weekday PM peak hour volumes for each intersection in the level of service analysis. This would be representative of a sold out varsity football game held on a Thursday night.

8.4.2 Average Daily Trips

The daily traffic volume for a stadium spectator event at High School No. 5 is forecast to be 2,176 trips, which includes 1,088 inbound trips and 1,088 outbound trips throughout the day. Daily trip generation for a special event land use like a high school stadium is highly variable, and depends on a number of local factors including demographics, weather patterns, team performance, and other site-specific criteria. The high school stadium is not one of the land use categories included in the Institute of Transportation Engineers (ITE) *Trip Generation* Manual, so two other sources were used to estimate the daily trip rate for the High School No. 5: 1) The San Diego Municipal Code Land Development Code Trip Generation Manual[3], and 2) the Estancia High School Stadium Traffic and Parking Impact Analysis[4].

The City of San Diego Traffic and Engineering Division recommended trip generation rate for a Sports Facility land use is 1 trip per attendee. A spectator sport facility is defined as a specially designed land use where people gather to watch a team sport or other attraction, such as the San Diego Qualcomm Stadium, the Sports Arena, or the Del Mar Race Track. This type of land use generally attracts more regional trips than a local high school football stadium, and would be expected to have a higher daily trip generation rate. The Newport-Mesa Unified School District proposed to build a stadium at Estancia High School in 2001. Estancia High is another local Orange County school located in the City of Costa Mesa. The Estancia High School Traffic and Parking Impact Analysis utilized a daily trip generation rate of 0.47 trips per seat, and forecast a total of 1,186 trips for a 2,523-seat stadium.

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COSTA MESA HIGH SCHOOL STADIUM TRAFFIC IMPACT ANALYSIS (IBI GROUP, 2013)

5.2 Trip Generation

The stadium land use category is not currently listed in the Institute of Transportation Engineers (ITE) *Trip Generation* Manual, and there is limited local or national survey data available for this type of use. High school stadiums typically do not generate a significant number of vehicle trips during the peak hours of adjacent street traffic, but volumes may vary depending on the type of event and the scheduled start time. Daily trip generation for this type of special event land use is highly variable, and depends on a number of local factors including demographics, weather patterns, team performance, and other site-specific criteria. Stadium uses that would not attract large numbers of spectators are not expected to generate any additional trips. Sports team practices and activities that take place on the track and field are already generating vehicle trips to the site. The only new trips that are expected to be generated by the stadium would be for events with a significant volume of spectators seated in the bleachers.

The Costa Mesa High School and Estancia High School football teams currently participate in games held at Jim Scott Stadium that draw spectators to Estancia High School during the fall season. The peak hour and daily trip estimates developed in this section would not be new trips generated by a new use, but are redistributed trips from Jim Scott Stadium at Estancia High School to the Costa Mesa High School site. If a stadium is constructed at Costa Mesa High School, the people that currently travel to Jim Scott Stadium to watch a game would travel to Costa Mesa High School instead. Trips that originate within the CMHS attendance area will travel a shorter distance, resulting in a net reduction in vehicle miles traveled (VMT).

Before the Jim Scott stadium was constructed at Estancia High School, a trip generation study was prepared by recording driveway volumes at Orange Coast College during a varsity football game between Costa Mesa High School and Estancia High School. The trip generation rates developed as part of the Estancia High School Stadium Traffic and Parking Impact Analysis[2] are summarized in Table 6-1, along with the CMHS stadium project trips.

Table 5-1 CMHS Stadium Project Trip Generation

	Units	Quantity	PM Peak Hour (Pre-Event)			Daily
			Inbound	Outbound	Total	
Rates[2]	*SEATS*		*0.19*	*0.01*	*0.20*	*0.47*
Project Trips	SEATS	1,000	190	10	200	470

The stadium trips developed in this section would not be generated on typical weekdays throughout the year. The daily driveway volume of 470 trips and 200 peak hour trips are only expected to occur when a varsity football game or other special event that fills the stadium would occur. This traffic would have the characteristics of a special event, and would not contribute to the typical daily traffic volumes year round.

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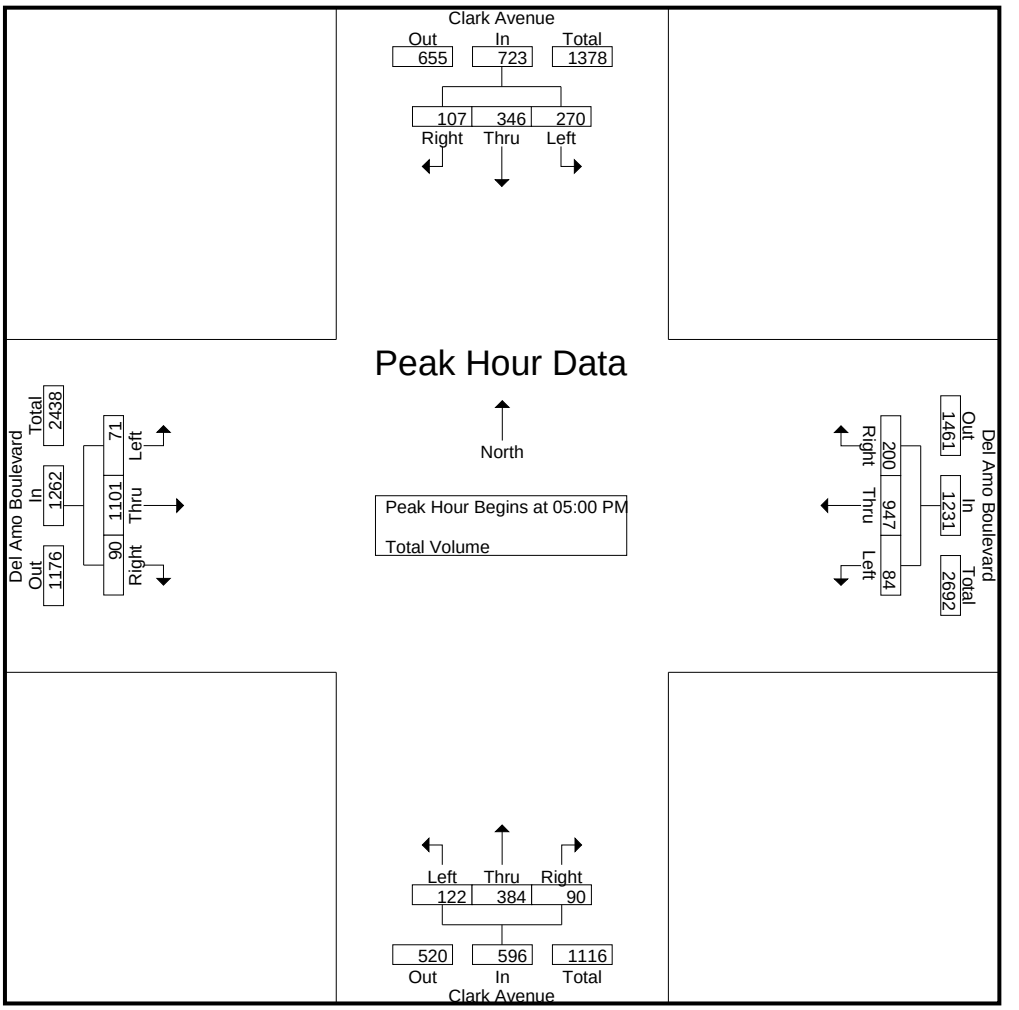
APPENDIX B: TRAFFIC COUNT DATA

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

City of Long Beach
N/S: Clark Avenue
E/W: Del Amo Boulevard
Weather: Clear

File Name : 01_LGB_Clark_Del Amo PM
Site Code : 20221401
Start Date : 8/12/2021
Page No : 2



Peak Hour Analysis From 05:00 PM to 06:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:30 PM				05:00 PM				05:15 PM				05:00 PM			
+0 mins.	75	100	**29**	**204**	13	211	43	267	31	**104**	23	158	**23**	264	24	311
+15 mins.	65	84	27	176	**28**	**269**	43	340	**41**	93	22	156	22	**310**	20	**352**
+30 mins.	**83**	**101**	19	203	23	198	48	269	24	84	23	131	15	266	**25**	306
+45 mins.	77	94	28	199	20	269	**66**	**355**	40	97	**25**	**162**	11	261	21	293
Total Volume	300	379	103	782	84	947	200	1231	136	378	93	607	71	1101	90	1262
% App. Total	38.4	48.5	13.2		6.8	76.9	16.2		22.4	62.3	15.3		5.6	87.2	7.1	
PHF	.904	.938	.888	.958	.750	.880	.758	.867	.829	.909	.930	.937	.772	.888	.900	.896

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

City of Long Beach
N/S: Clark Avenue
E/W: Arbor Road
Weather: Clear

File Name : 02_LGB_Clark_Arbor PM
Site Code : 20221401
Start Date : 8/12/2021
Page No : 1

Groups Printed- Total Volume

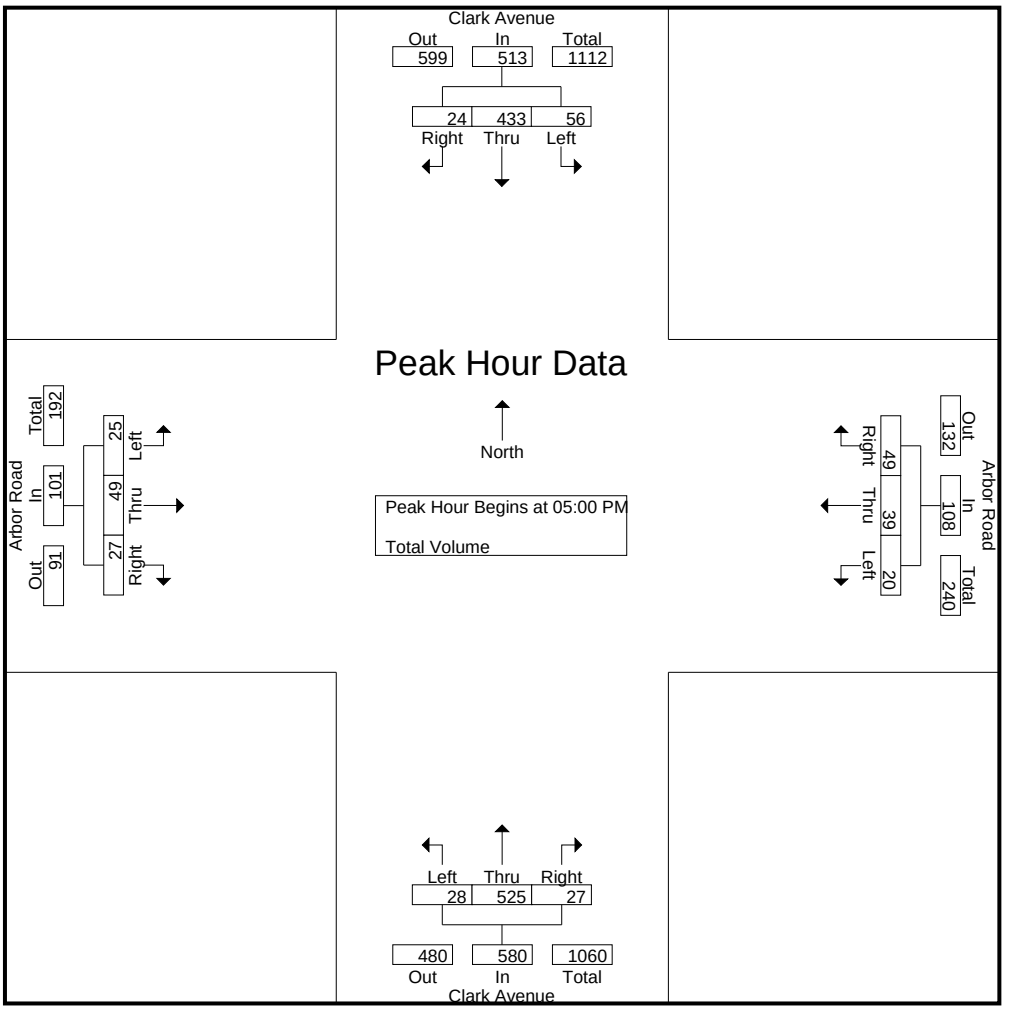
	Clark Avenue Southbound				Arbor Road Westbound				Clark Avenue Northbound				Arbor Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
05:00 PM	16	106	8	130	6	8	10	24	8	129	7	144	10	8	4	22	320
05:15 PM	14	95	7	116	10	8	11	29	0	147	12	159	7	16	11	34	338
05:30 PM	13	122	3	138	3	12	14	29	13	128	2	143	3	14	6	23	333
05:45 PM	13	110	6	129	1	11	14	26	7	121	6	134	5	11	6	22	311
Total	56	433	24	513	20	39	49	108	28	525	27	580	25	49	27	101	1302
06:00 PM	9	121	6	136	2	9	12	23	3	127	3	133	9	8	2	19	311
06:15 PM	14	110	8	132	8	9	9	26	3	110	4	117	3	13	5	21	296
06:30 PM	9	95	6	110	2	5	11	18	3	92	3	98	9	11	3	23	249
06:45 PM	8	83	5	96	7	4	4	15	7	73	3	83	8	7	5	20	214
Total	40	409	25	474	19	27	36	82	16	402	13	431	29	39	15	83	1070
Grand Total	96	842	49	987	39	66	85	190	44	927	40	1011	54	88	42	184	2372
Apprch %	9.7	85.3	5		20.5	34.7	44.7		4.4	91.7	4		29.3	47.8	22.8		
Total %	4	35.5	2.1	41.6	1.6	2.8	3.6	8	1.9	39.1	1.7	42.6	2.3	3.7	1.8	7.8	

	Clark Avenue Southbound				Arbor Road Westbound				Clark Avenue Northbound				Arbor Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 06:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	**16**	106	**8**	130	6	8	10	24	8	129	7	144	**10**	8	4	22	320
05:15 PM	14	95	7	116	**10**	8	11	**29**	0	**147**	**12**	**159**	7	**16**	**11**	**34**	**338**
05:30 PM	13	**122**	3	**138**	3	**12**	**14**	29	**13**	128	2	143	3	14	6	23	333
05:45 PM	13	110	6	129	1	11	14	26	7	121	6	134	5	11	6	22	311
Total Volume	56	433	24	513	20	39	49	108	28	525	27	580	25	49	27	101	1302
% App. Total	10.9	84.4	4.7		18.5	36.1	45.4		4.8	90.5	4.7		24.8	48.5	26.7		
PHF	.875	.887	.750	.929	.500	.813	.875	.931	.538	.893	.563	.912	.625	.766	.614	.743	.963

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

City of Long Beach
N/S: Clark Avenue
E/W: Arbor Road
Weather: Clear

File Name : 02_LGB_Clark_Arbor PM
Site Code : 20221401
Start Date : 8/12/2021
Page No : 2



Peak Hour Analysis From 05:00 PM to 06:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:30 PM				05:00 PM				05:00 PM				05:00 PM			
+0 mins.	13	**122**	3	**138**	6	8	10	24	8	129	7	144	**10**	8	4	22
+15 mins.	13	110	6	129	**10**	8	11	**29**	0	**147**	**12**	**159**	7	**16**	**11**	**34**
+30 mins.	9	121	6	136	3	**12**	**14**	29	**13**	128	2	143	3	14	6	23
+45 mins.	**14**	110	**8**	132	1	11	14	26	7	121	6	134	5	11	6	22
Total Volume	49	463	23	535	20	39	49	108	28	525	27	580	25	49	27	101
% App. Total	9.2	86.5	4.3		18.5	36.1	45.4		4.8	90.5	4.7		24.8	48.5	26.7	
PHF	.875	.949	.719	.969	.500	.813	.875	.931	.538	.893	.563	.912	.625	.766	.614	.743

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City of Long Beach
N/S: Charlemagne Avenue
E/W: Arbor Road
Weather: Clear

File Name : 03_LGB_Charlemagne_Arbor PM
Site Code : 20221401
Start Date : 8/12/2021
Page No : 1

Groups Printed- Total Volume

	Arbor Road Westbound			Charlemagne Avenue Northbound			Arbor Road Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
05:00 PM	2	17	19	1	6	7	22	4	26	52
05:15 PM	3	22	25	2	2	4	33	6	39	68
05:30 PM	7	16	23	6	7	13	27	6	33	69
05:45 PM	6	23	29	3	2	5	23	7	30	64
Total	18	78	96	12	17	29	105	23	128	253
06:00 PM	1	11	12	8	7	15	14	5	19	46
06:15 PM	6	21	27	5	4	9	23	10	33	69
06:30 PM	2	14	16	3	4	7	16	6	22	45
06:45 PM	7	14	21	1	4	5	13	6	19	45
Total	16	60	76	17	19	36	66	27	93	205
Grand Total	34	138	172	29	36	65	171	50	221	458
Apprch %	19.8	80.2		44.6	55.4		77.4	22.6		
Total %	7.4	30.1	37.6	6.3	7.9	14.2	37.3	10.9	48.3	

	Arbor Road Westbound			Charlemagne Avenue Northbound			Arbor Road Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 06:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	2	17	19	1	6	7	22	4	26	52
05:15 PM	3	22	25	2	2	4	**33**	6	**39**	68
05:30 PM	**7**	16	23	**6**	**7**	**13**	27	6	33	**69**
05:45 PM	6	**23**	**29**	3	2	5	23	**7**	30	64
Total Volume	18	78	96	12	17	29	105	23	128	253
% App. Total	18.8	81.2		41.4	58.6		82	18		
PHF	.643	.848	.828	.500	.607	.558	.795	.821	.821	.917

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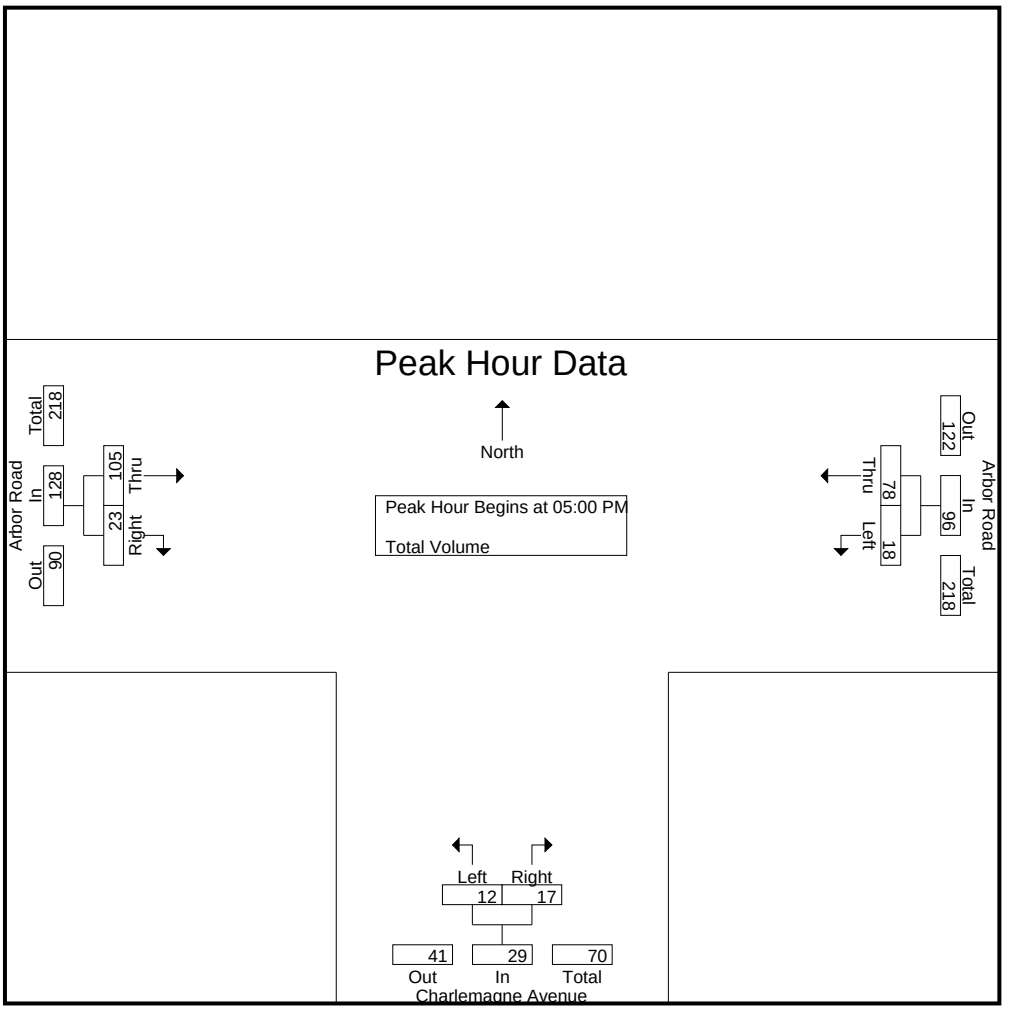
City of Long Beach
N/S: Charlemagne Avenue
E/W: Arbor Road
Weather: Clear

File Name : 03_LGB_Charlemagne_Arbor PM
Site Code : 20221401
Start Date : 8/12/2021



Peak Hour Analysis From 05:00 PM to 06:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM			05:30 PM			05:00 PM		
+0 mins.	2	17	19	6	**7**	13	22	4	26
+15 mins.	3	22	25	3	2	5	**33**	6	**39**
+30 mins.	**7**	16	23	**8**	7	**15**	27	6	33
+45 mins.	6	**23**	**29**	5	4	9	23	**7**	30
Total Volume	18	78	96	22	20	42	105	23	128
% App. Total	18.8	81.2		52.4	47.6		82	18	
PHF	.643	.848	.828	.688	.714	.700	.795	.821	.821

Placeworks – October 5, 2021

APPENDIX C: LEVEL OF SERVICE CALCULATIONS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	1101	90	84	947	200	122	384	90	270	346	107
Future Volume (veh/h)	71	1101	90	84	947	200	122	384	90	270	346	107
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	77	1197	98	91	1029	217	133	417	98	293	376	116
Adj No. of Lanes	1	3	0	1	3	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	103	1336	109	116	1205	254	411	810	189	414	800	244
Arrive On Green	0.06	0.28	0.28	0.07	0.29	0.29	0.08	0.28	0.28	0.09	0.30	0.30
Sat Flow, veh/h	1774	4792	392	1774	4210	887	1774	2851	664	1774	2674	815
Grp Volume(v), veh/h	77	847	448	91	828	418	133	257	258	293	247	245
Grp Sat Flow(s),veh/h/ln	1774	1695	1794	1774	1695	1706	1774	1770	1746	1774	1770	1719
Q Serve(g_s), s	2.7	15.4	15.4	3.2	14.8	14.8	3.3	7.8	7.9	5.8	7.3	7.5
Cycle Q Clear(g_c), s	2.7	15.4	15.4	3.2	14.8	14.8	3.3	7.8	7.9	5.8	7.3	7.5
Prop In Lane	1.00		0.22	1.00		0.52	1.00		0.38	1.00		0.47
Lane Grp Cap(c), veh/h	103	945	500	116	970	488	411	503	496	414	530	515
V/C Ratio(X)	0.75	0.90	0.90	0.78	0.85	0.86	0.32	0.51	0.52	0.71	0.47	0.48
Avail Cap(c_a), veh/h	138	953	504	138	970	488	416	503	496	414	530	515
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.7	22.2	22.2	29.5	21.6	21.6	14.6	19.2	19.3	18.0	18.3	18.3
Incr Delay (d2), s/veh	13.8	11.0	18.4	21.2	7.5	13.9	0.5	3.7	3.9	5.4	2.9	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	8.6	10.2	2.3	7.9	8.8	1.6	4.3	4.3	2.8	4.0	4.0
LnGrp Delay(d),s/veh	43.5	33.2	40.7	50.6	29.1	35.5	15.0	22.9	23.1	23.4	21.2	21.5
LnGrp LOS	D	C	D	D	C	D	B	C	C	C	C	C
Approach Vol, veh/h		1372			1337			648			785	
Approach Delay, s/veh		36.2			32.6			21.4			22.1	
Approach LOS		D			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	22.7	8.7	22.4	9.3	23.7	8.2	22.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.8	18.2	5.0	18.0	5.0	19.0	5.0	18.0
Max Q Clear Time (g_c+I1), s	7.8	9.9	5.2	17.4	5.3	9.5	4.7	16.8
Green Ext Time (p_c), s	0.0	2.0	0.0	0.5	0.0	2.1	0.0	0.9

Intersection Summary	
HCM 2010 Ctrl Delay	30.0
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	49	27	20	39	49	28	525	27	56	433	24
Future Volume (veh/h)	25	49	27	20	39	49	28	525	27	56	433	24
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	27	53	29	22	42	53	30	571	29	61	471	26
Adj No. of Lanes	0	1	0	0	1	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	160	110	53	183	164	195	650	1174	998	578	1174	998
Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	0.63	0.63	0.63	0.63	0.63	0.63
Sat Flow, veh/h	298	897	433	409	1331	1583	897	1863	1583	815	1863	1583
Grp Volume(v), veh/h	109	0	0	64	0	53	30	571	29	61	471	26
Grp Sat Flow(s),veh/h/ln	1628	0	0	1740	0	1583	897	1863	1583	815	1863	1583
Q Serve(g_s), s	1.1	0.0	0.0	0.0	0.0	1.1	0.6	6.0	0.3	1.6	4.6	0.2
Cycle Q Clear(g_c), s	2.3	0.0	0.0	1.1	0.0	1.1	5.2	6.0	0.3	7.5	4.6	0.2
Prop In Lane	0.25		0.27	0.34		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	324	0	0	347	0	195	650	1174	998	578	1174	998
V/C Ratio(X)	0.34	0.00	0.00	0.18	0.00	0.27	0.05	0.49	0.03	0.11	0.40	0.03
Avail Cap(c_a), veh/h	920	0	0	949	0	781	650	1174	998	578	1174	998
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.0	0.0	0.0	14.5	0.0	14.5	4.6	3.6	2.5	5.6	3.3	2.5
Incr Delay (d2), s/veh	0.6	0.0	0.0	0.3	0.0	0.7	0.1	1.4	0.1	0.4	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.0	0.6	0.0	0.5	0.2	3.5	0.1	0.4	2.6	0.1
LnGrp Delay(d),s/veh	15.6	0.0	0.0	14.8	0.0	15.3	4.8	5.0	2.6	6.0	4.4	2.6
LnGrp LOS	B			B		B	A	A	A	A	A	A
Approach Vol, veh/h		109			117			630			558	
Approach Delay, s/veh		15.6			15.0			4.9			4.5	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		27.5		9.0		27.5		9.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		23.0		18.0		23.0		18.0
Max Q Clear Time (g_c+I1), s		8.0		4.3		9.5		3.1
Green Ext Time (p_c), s		3.6		0.4		2.9		0.4

Intersection Summary		
HCM 2010 Ctrl Delay		6.4
HCM 2010 LOS		A

Intersection	
Int Delay, s/veh	1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	105	23	18	78	12	17
Future Vol, veh/h	105	23	18	78	12	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	27	-	-	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	114	25	20	85	13	18

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	139	0	239	114
Stage 1	-	-	-	-	114	-
Stage 2	-	-	-	-	125	-
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	-	-	1445	-	749	939
Stage 1	-	-	-	-	911	-
Stage 2	-	-	-	-	901	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1445	-	738	939
Mov Cap-2 Maneuver	-	-	-	-	738	-
Stage 1	-	-	-	-	911	-
Stage 2	-	-	-	-	887	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.4	9.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	844	-	-	1445	-
HCM Lane V/C Ratio	0.037	-	-	0.014	-
HCM Control Delay (s)	9.4	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	1101	101	95	947	200	123	385	91	270	357	107
Future Volume (veh/h)	71	1101	101	95	947	200	123	385	91	270	357	107
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	77	1197	110	103	1029	217	134	418	99	293	388	116
Adj No. of Lanes	1	3	0	1	3	0	1	2	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	103	1315	121	132	1236	260	401	795	187	409	794	235
Arrive On Green	0.06	0.28	0.28	0.07	0.29	0.29	0.08	0.28	0.28	0.09	0.29	0.29
Sat Flow, veh/h	1774	4741	436	1774	4210	887	1774	2846	668	1774	2695	797
Grp Volume(v), veh/h	77	856	451	103	828	418	134	259	258	293	253	251
Grp Sat Flow(s),veh/h/ln	1774	1695	1786	1774	1695	1706	1774	1770	1745	1774	1770	1722
Q Serve(g_s), s	2.8	15.8	15.8	3.7	14.8	14.8	3.4	8.0	8.1	5.9	7.6	7.8
Cycle Q Clear(g_c), s	2.8	15.8	15.8	3.7	14.8	14.8	3.4	8.0	8.1	5.9	7.6	7.8
Prop In Lane	1.00		0.24	1.00		0.52	1.00		0.38	1.00		0.46
Lane Grp Cap(c), veh/h	103	940	495	132	995	501	401	495	488	409	521	507
V/C Ratio(X)	0.75	0.91	0.91	0.78	0.83	0.83	0.33	0.52	0.53	0.72	0.49	0.49
Avail Cap(c_a), veh/h	137	942	496	137	995	501	403	495	488	409	521	507
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.0	22.6	22.6	29.5	21.4	21.4	15.0	19.7	19.7	18.5	18.8	18.9
Incr Delay (d2), s/veh	14.6	12.7	20.9	24.2	6.1	11.5	0.5	3.9	4.1	5.9	3.2	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	9.0	10.6	2.7	7.7	8.6	1.7	4.4	4.4	2.9	4.2	4.2
LnGrp Delay(d),s/veh	44.6	35.3	43.5	53.6	27.5	32.9	15.5	23.6	23.8	24.4	22.0	22.3
LnGrp LOS	D	D	D	D	C	C	B	C	C	C	C	C
Approach Vol, veh/h		1384			1349			651			797	
Approach Delay, s/veh		38.5			31.2			22.0			23.0	
Approach LOS		D			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.4	22.6	9.3	22.5	9.4	23.6	8.2	23.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.9	18.1	5.0	18.0	5.0	19.0	5.0	18.0
Max Q Clear Time (g_c+I1), s	7.9	10.1	5.7	17.8	5.4	9.8	4.8	16.8
Green Ext Time (p_c), s	0.0	1.9	0.0	0.1	0.0	2.1	0.0	0.9

Intersection Summary	
HCM 2010 Ctrl Delay	30.6
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	82	49	84	20	39	49	28	605	27	59	437	27
Future Volume (veh/h)	82	49	84	20	39	49	28	605	27	59	437	27
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	89	53	91	22	42	53	30	658	29	64	475	29
Adj No. of Lanes	0	1	0	0	1	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	202	94	121	181	278	317	575	1127	958	449	1127	958
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.61	0.61	0.61	0.61	0.61	0.61
Sat Flow, veh/h	474	470	605	382	1387	1583	891	1863	1583	752	1863	1583
Grp Volume(v), veh/h	233	0	0	64	0	53	30	658	29	64	475	29
Grp Sat Flow(s),veh/h/ln	1548	0	0	1769	0	1583	891	1863	1583	752	1863	1583
Q Serve(g_s), s	4.8	0.0	0.0	0.0	0.0	1.3	0.9	10.0	0.3	2.6	6.3	0.3
Cycle Q Clear(g_c), s	6.5	0.0	0.0	1.3	0.0	1.3	7.1	10.0	0.3	12.6	6.3	0.3
Prop In Lane	0.38		0.39	0.34		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	418	0	0	459	0	317	575	1127	958	449	1127	958
V/C Ratio(X)	0.56	0.00	0.00	0.14	0.00	0.17	0.05	0.58	0.03	0.14	0.42	0.03
Avail Cap(c_a), veh/h	702	0	0	759	0	616	575	1127	958	449	1127	958
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.3	0.0	0.0	15.3	0.0	15.3	6.7	5.6	3.7	9.4	4.8	3.7
Incr Delay (d2), s/veh	1.2	0.0	0.0	0.1	0.0	0.2	0.2	2.2	0.1	0.7	1.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.0	0.0	0.7	0.0	0.6	0.2	5.6	0.2	0.6	3.5	0.2
LnGrp Delay(d),s/veh	18.5	0.0	0.0	15.5	0.0	15.6	6.9	7.8	3.7	10.1	6.0	3.7
LnGrp LOS	B			B		B	A	A	A	B	A	A
Approach Vol, veh/h		233			117			717			568	
Approach Delay, s/veh		18.5			15.5			7.6			6.3	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		32.5		13.8		32.5		13.8
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		28.0		18.0		28.0		18.0
Max Q Clear Time (g_c+I1), s		12.0		8.5		14.6		3.3
Green Ext Time (p_c), s		4.4		0.9		3.0		0.4

Intersection Summary		
HCM 2010 Ctrl Delay		9.3
HCM 2010 LOS		A

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	109	23	18	158	12	17
Future Vol, veh/h	109	23	18	158	12	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	27	-	-	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	118	25	20	172	13	18

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	143	0	330	118
Stage 1	-	-	-	-	118	-
Stage 2	-	-	-	-	212	-
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	-	-	1440	-	665	934
Stage 1	-	-	-	-	907	-
Stage 2	-	-	-	-	823	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1440	-	655	934
Mov Cap-2 Maneuver	-	-	-	-	655	-
Stage 1	-	-	-	-	907	-
Stage 2	-	-	-	-	811	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	794	-	-	1440	-
HCM Lane V/C Ratio	0.04	-	-	0.014	-
HCM Control Delay (s)	9.7	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-