

MEMORANDUM

DATE: August 9, 2019

TO: City of Spokane

FROM: Spenser Haynie
TENW

SUBJECT: Traffic Impact Assessment
Chick-fil-A – Spokane, WA
TENW Project No. 5913

This memorandum documents the preliminary traffic information for the proposed Chick-fil-A Restaurant project in Spokane, WA. The study includes a project description, trip generation estimate, trip distribution, and level of service evaluation at the adjacent US 2 / E Hoerner Ave intersection.

Project Description

The Chick-fil-A project is located at 9304 N Newport Highway in Spokane, WA as shown in the **Attachment A** vicinity map. The proposed project includes a 4,833 square foot Chick-fil-A fast-food restaurant with a drive-through window. Vehicle access to/from the project would be provided by two full access driveways on E Hoerner Ave. The existing site includes 4,432 SF used automobile sales which would be removed with the proposed project. A preliminary site plan concept is shown in **Attachment B**.

Trip Generation

Trip generation for the proposed and existing uses were determined using methodology included in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 10th Edition for Land Use Code (LUC) 943 (Fast-Food Restaurant with Drive-Through Window) and LUC 841 (Automobile Sales (Used)). Adjustments to the trip generation estimates were made to account for pass-by trips which are made by vehicles that are already on adjacent streets and make intermediate stops at the site en-route to a primary destination (e.g. on the way home from work). The resulting net new weekday daily, AM, and PM peak hour trips are summarized in **Table 1**. Detailed trip generation calculations are included in **Attachment C**.

Table 1
Chick-fil-A Spokane – Trip Generation Summary

Time Period	Net New Trips Generated		
	In	Out	Total
Weekday Daily	509	509	1,018
Weekday AM Peak Hour	44	46	90
Weekday PM Peak Hour	33	29	62

As shown in **Table 1**, the proposed Chick-fil-A Spokane development is estimated to generate 1,018 net new weekday daily trips with 90 net new trips occurring during the weekday AM peak hour and 62 net new trips occurring during the weekday PM peak hour.

Trip Distribution

The estimated distribution of new trips generated by the proposed Chick-fil-A Restaurant was based on anticipated travel patterns in the area. The estimated distribution of project generated traffic is shown graphically in **Attachment D**.

Traffic Volumes

Existing weekday AM and PM peak hour traffic volumes at the adjacent US 2 / E Hoerner Ave intersection were based on counts collected in July 2019.

Future year 2020 Without Project (No Action) peak hour traffic volume forecasts at the adjacent US 2 / E Hoerner Ave study intersection were estimated using a 2 percent annual growth rate applied to the existing 2019 peak hour traffic counts. Adding the proposed Chick-fil-A Spokane trips to the adjacent study intersection to the future 2020 Without Project traffic volumes results in the future 2020 With Project AM and PM peak hour traffic volumes. The future 2020 Without Project, project trip assignment, and future 2020 With Project peak hour traffic volumes are shown in **Attachment E**.

Level of Service Analysis

Weekday AM and PM peak hour level of service (LOS) analyses were conducted at the adjacent US 2 / E Hoerner Ave intersection using the methodologies and procedures outlined in the latest edition of the *Highway Capacity Manual* (6th Edition) for future Without Project and With Project conditions. LOS serves as an indicated of the quality of traffic flow and degree of congestion at an intersection or roadway segment. It is a measure of vehicle operating speed, travel time, and driving comfort. The LOS methodology is described in **Attachment F**. The Synchro version 10 software package was used to determine LOS. **Table 2** summarizes the weekday AM and PM peak hour LOS analyses at the adjacent US 2 / E Hoerner Ave intersection. The LOS worksheets are included in **Attachment F**.

Table 2
Year 2020 Peak Hour Level of Service Summary

Study Intersection	2020 Without Project			2020 With Project		
	LOS ¹	Delay (sec) ²	95 th % Queue (ft)	LOS ¹	Delay (sec) ²	95 th % Queue (ft)
AM PEAK HOUR						
<u>Two-Way Stop Controlled:</u>						
1. US 2 / E Hoerner Ave						
Westbound Left	C	15.5	< 25'	C	20.8	25'
Westbound Right	A	9.6	< 25'	A	9.9	< 25'
Southbound Left	A	8.1	< 25'	A	8.4	< 25'
PM PEAK HOUR						
<u>Two-Way Stop Controlled:</u>						
1. US 2 / E Hoerner Ave						
Westbound Left	D	25.8	< 25'	D	34.8	25'
Westbound Right	B	13.1	< 25'	B	13.8	25'
Southbound Left	B	10.8	< 25'	B	11.3	25'

1. LOS = Level of Service

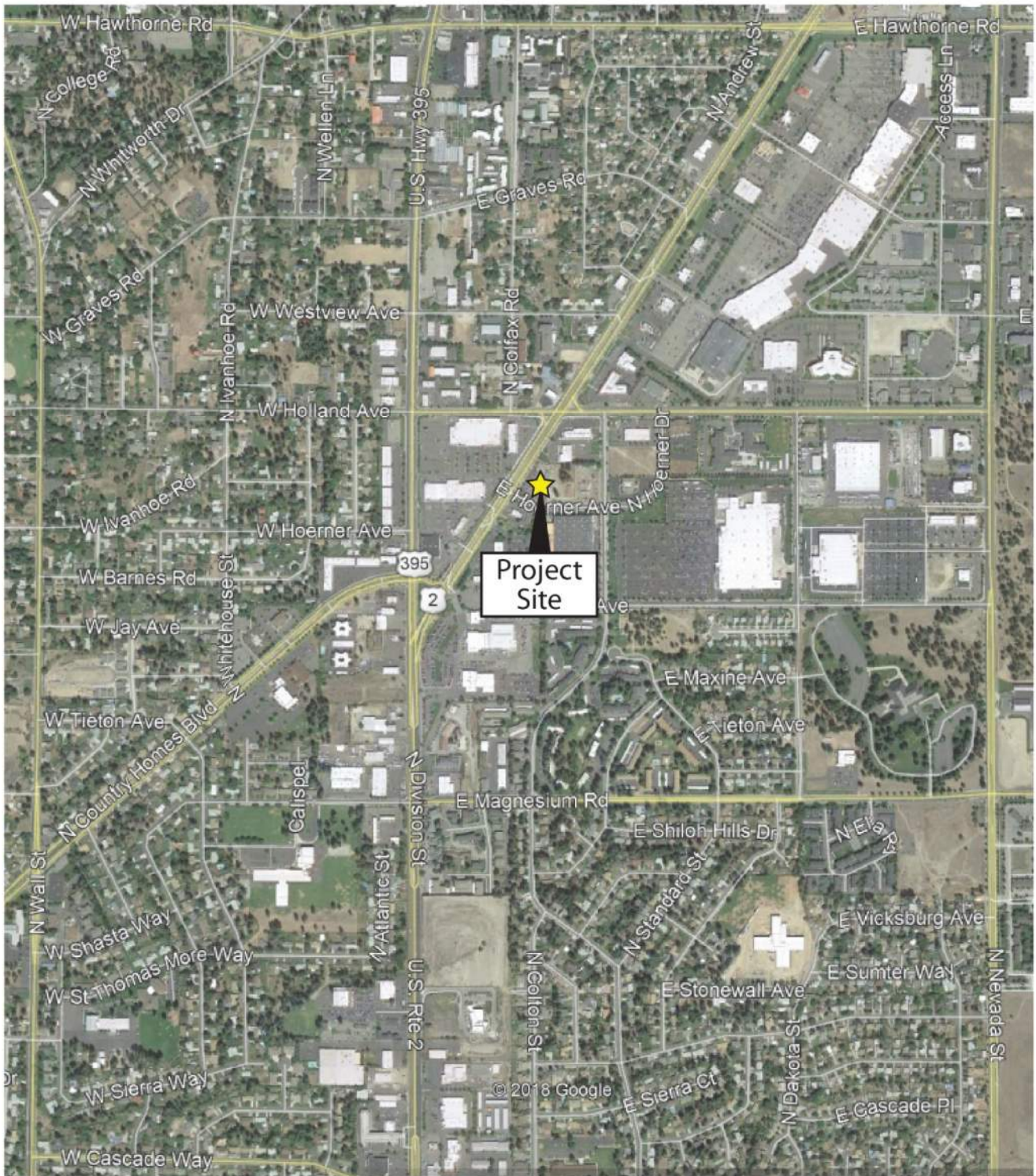
2. Delay refers to average control delay expressed in seconds per vehicle.

As shown in **Table 2**, all controlled movements at the adjacent US 2 / E Hoerner Ave intersection are anticipated to operate at acceptable levels (LOS D or better) with minimal queuing in 2020 Without or With the proposed Chick-fil-A project.

Please contact Spenser Haynie at 206-390-7253 or spenser@tenw.com if you have any questions with the information included in this memorandum.

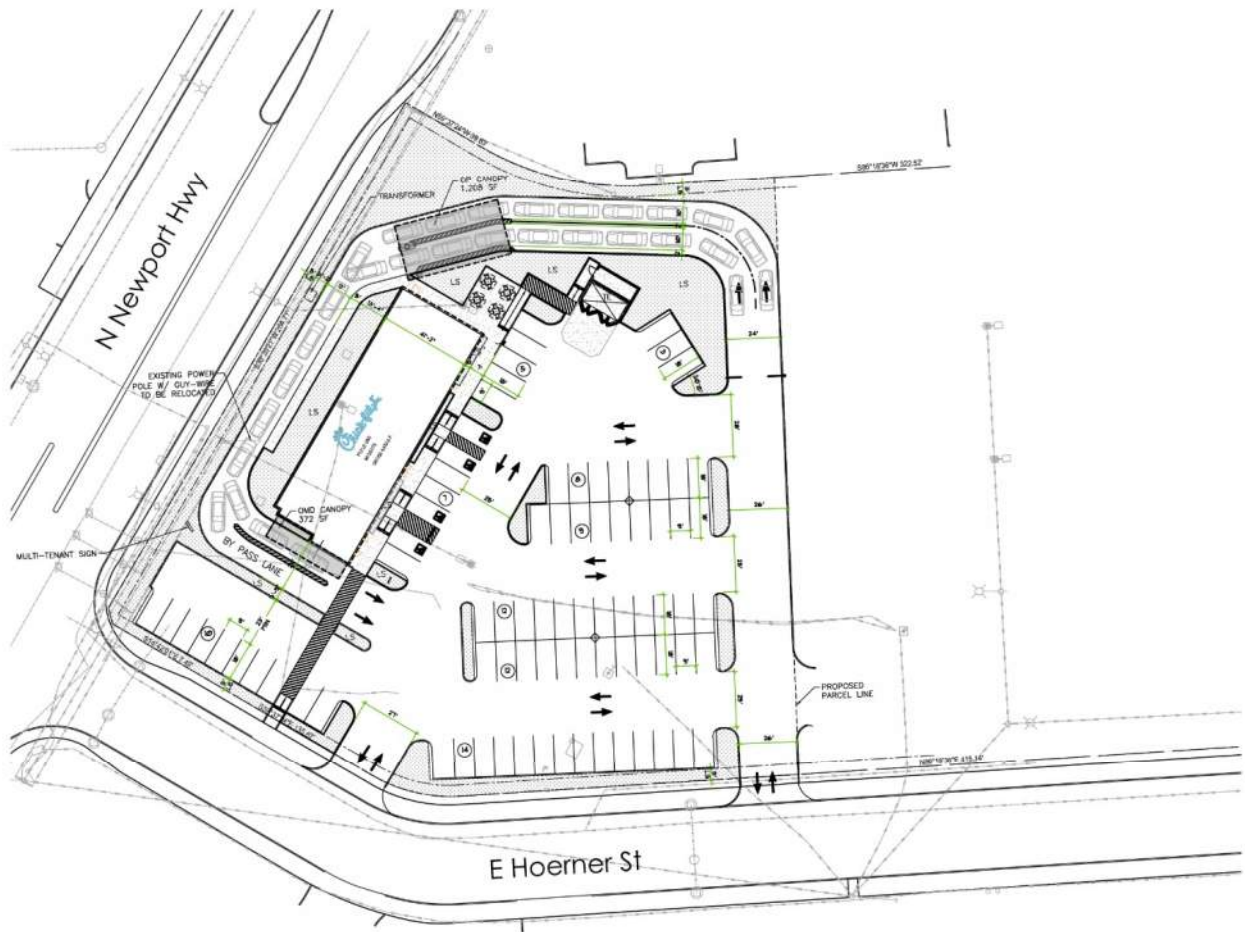
cc: Don Ikeler, Chick-fil-A Corporation
Jeff Schramm – Planning Manager, TENW

Attachments



Attachment A: Project Site Vicinity





Attachment B: Preliminary Site Plan



ATTACHMENT C

Trip Generation Calculations

Chick-fil-A Spokane Trip Generation Summary

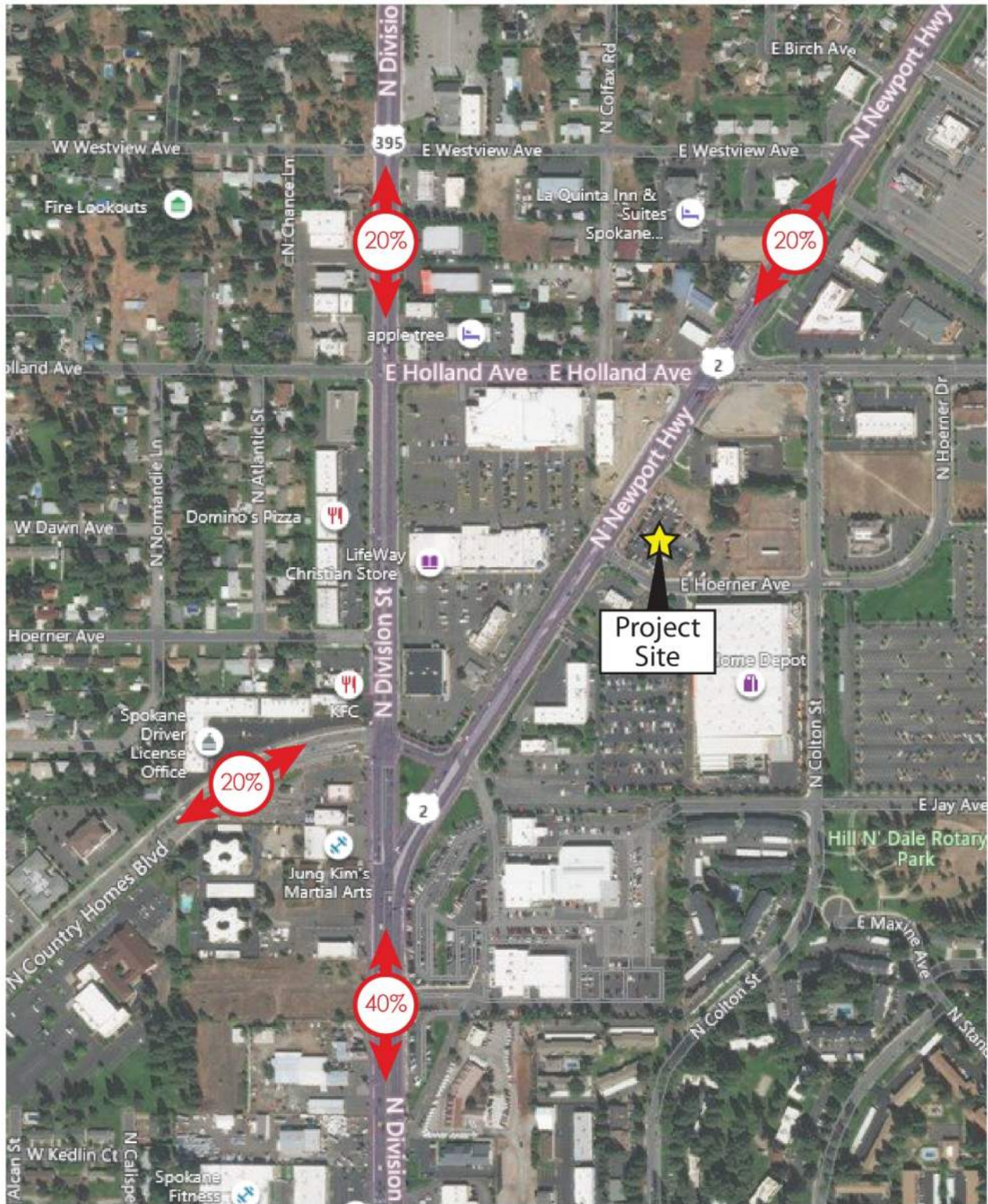
Land Use	Area	Units ¹	ITE LUC ²	Directional Distribution		Trip Rate	Trips Generated		
				In	Out		In	Out	Total
Weekday Daily									
<u>Proposed Use:</u>									
Fast-Food Rest. with Drive-Thru	4,833	GFA	934	50%	50%	470.95	1,138	1,138	2,276
<i>Pass-By Trips</i> ³	50%						-569	-569	-1,138
						Net Proposed Trips =	569	569	1,138
<u>Less Existing Use:</u>									
Automobile Sales (Used)	4,432	GFA	841	50%	50%	27.06	-60	-60	-120
Net New Weekday Daily Trips =							509	509	1,018
Weekday AM Peak Hour									
<u>Proposed Use:</u>									
Fast-Food Rest. with Drive-Thru	4,833	GFA	934	51%	49%	40.19	99	95	194
<i>Pass-By Trips</i> ³	49%						-48	-47	-95
						Net Proposed Trips =	51	48	99
<u>Less Existing Use:</u>									
Automobile Sales (Used)	4,432	GFA	841	76%	24%	2.13	-7	-2	-9
Net New Weekday AM Peak Hour Trips =							44	46	90
Weekday PM Peak Hour									
<u>Proposed Use:</u>									
Fast-Food Rest. with Drive-Thru	4,833	GFA	934	52%	48%	32.67	82	76	158
<i>Pass-By Trips</i> ³	50%						-41	-38	-79
						Net Proposed Trips =	41	38	79
<u>Less Existing Use:</u>									
Automobile Sales (Used)	4,432	GFA	841	47%	53%	3.75	-8	-9	-17
Net New Weekday PM Peak Hour Trips =							33	29	62

Notes:

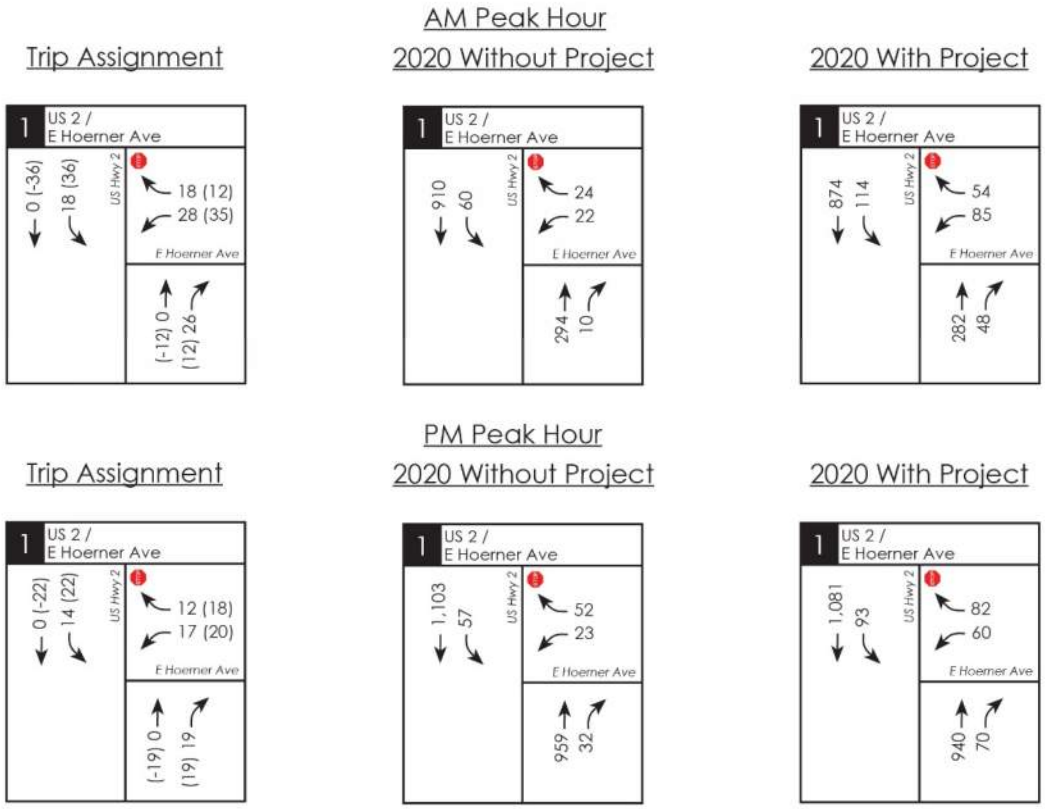
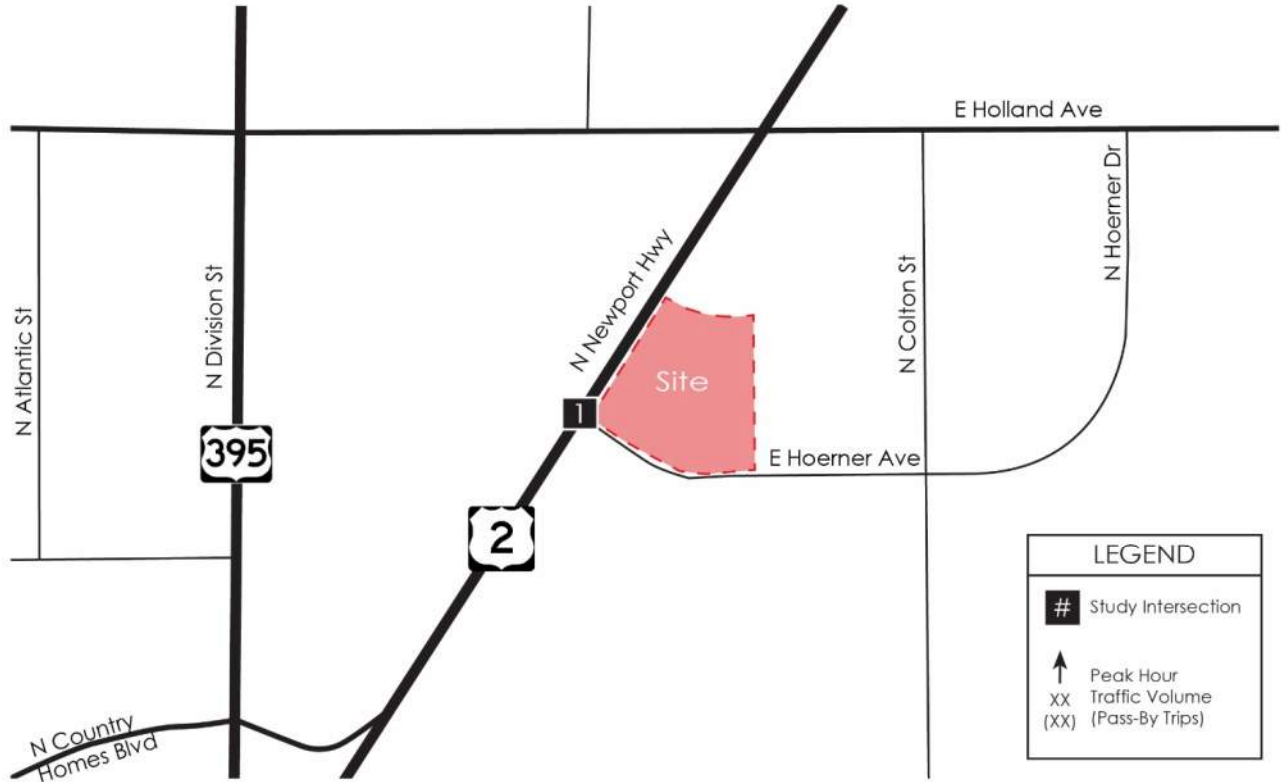
¹ GFA = Gross Floor Area.

² Institute of Transportation Engineers, Trip Generation Manual, 10th edition Land Use Code.

³ Pass-by percentage based on studies documented in the ITE Trip Generation Handbook, 3rd Edition.



Attachment D: Project Trip Distribution



Attachement E: Weekday Peak Hour Traffic Volumes



ATTACHMENT F

LOS Methodology and Calculations

Level of Service Methodology

Level of service calculations for intersections were based on methodology and procedures outlined in the 2016 *Highway Capacity Manual*, 6th edition (HCM 6), Transportation Research Board using *Synchro 10* traffic analysis software.

LOS generally refers to the degree of congestion on a roadway or intersection. It is a measure of vehicle operating speed, travel time, travel delays, and driving comfort. A letter scale from A to F generally describes intersection LOS. At signalized intersections, LOS A represents free-flow conditions (motorists experience little or no delays), and LOS F represents forced-flow conditions where motorists experience an average delay in excess of 80 seconds per vehicle.

The LOS reported for signalized intersections represents the average control delay (sec/veh) and can be reported for the overall intersection, for each approach, and for each lane group (additional v/c ratio criteria apply to lane group LOS only).

The LOS reported at stop-controlled intersections is based on the average control delay and can be reported for each controlled minor approach, controlled minor lane group, and controlled major-street movement (and for the overall intersection at all-way stop controlled intersections. Additional v/c ratio criteria apply to lane group or movement LOS only).

Table F1 outlines the current HCM 6 LOS criteria for signalized and stop-controlled intersections based on these methodologies.

Table F1
LOS Criteria for Signalized and Stop Controlled Intersections¹

SIGNALIZED INTERSECTIONS			STOP-CONTROLLED INTERSECTIONS		
Control Delay (sec/veh)	LOS by Volume-to Capacity (V/C) Ratio ²		Control Delay (sec/veh)	LOS by Volume-to Capacity (V/C) Ratio ³	
	≤ 1.0	> 1.0		≤ 1.0	> 1.0
≤ 10	A	F	≤ 10	A	F
> 10 to ≤ 20	B	F	> 10 to ≤ 15	B	F
> 20 to ≤ 35	C	F	> 15 to ≤ 25	C	F
> 35 to ≤ 55	D	F	> 25 to ≤ 35	D	F
> 55 to ≤ 80	E	F	> 35 to ≤ 50	E	F
> 80	F	F	> 50	F	F

¹ Source: Highway Capacity Manual, 6th Edition, Transportation Research Board, 2016.

² For approach-based and intersection-wide assessments at signals, LOS is defined solely by control delay.

³ For two-way stop-controlled intersections, the LOS criteria apply to each lane on a given approach and to each approach on the minor street. LOS is not calculated for major-street approaches or for the intersection as a whole at two-way stop controlled intersections. For approach-based and intersection-wide assessments at all-way stop controlled intersections, LOS is solely defined by control delay.

Lanes, Volumes, Timings
 1: N Newport Hwy & E Hoerner St

08/01/2019



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	22	24	294	10	60	910
Future Volume (vph)	22	24	294	10	60	910
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	225	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25				25	
Link Speed (mph)	25		55			55
Link Distance (ft)	534		999			1650
Travel Time (s)	14.6		12.4			20.5
Confl. Peds. (#/hr)	3	7		3	7	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	8%	5%	20%	3%	2%
Shared Lane Traffic (%)						
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other

Control Type: Unsignalized

HCM 6th TWSC
1: N Newport Hwy & E Hoerner St

08/01/2019

Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↕		↘	↕
Traffic Vol, veh/h	22	24	294	10	60	910
Future Vol, veh/h	22	24	294	10	60	910
Conflicting Peds, #/hr	3	7	0	3	7	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	225	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	8	5	20	3	2
Mvmt Flow	23	26	313	11	64	968

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	941	176	0	0	331
Stage 1	326	-	-	-	-
Stage 2	615	-	-	-	-
Critical Hdwy	6.8	7.06	-	-	4.16
Critical Hdwy Stg 1	5.8	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-
Follow-up Hdwy	3.5	3.38	-	-	2.23
Pot Cap-1 Maneuver	265	818	-	-	1218
Stage 1	710	-	-	-	-
Stage 2	507	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	249	807	-	-	1210
Mov Cap-2 Maneuver	367	-	-	-	-
Stage 1	705	-	-	-	-
Stage 2	479	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.4	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	367	807	1210
HCM Lane V/C Ratio	-	-	0.064	0.032	0.053
HCM Control Delay (s)	-	-	15.5	9.6	8.1
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	0.2

Lanes, Volumes, Timings
 1: N Newport Hwy & E Hoerner St

08/01/2019



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	23	52	959	32	57	1103
Future Volume (vph)	23	52	959	32	57	1103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	225	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25				25	
Link Speed (mph)	25		55			55
Link Distance (ft)	534		999			1650
Travel Time (s)	14.6		12.4			20.5
Confl. Peds. (#/hr)	4	4		4	4	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Shared Lane Traffic (%)						
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other

Control Type: Unsignalized

HCM 6th TWSC
 1: N Newport Hwy & E Hoerner St

08/01/2019

Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↗	↕		↙	↕
Traffic Vol, veh/h	23	52	959	32	57	1103
Future Vol, veh/h	23	52	959	32	57	1103
Conflicting Peds, #/hr	4	4	0	4	4	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	225	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	1	0	0	1
Mvmt Flow	24	54	999	33	59	1149

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1717	524	0	0	1036	0
Stage 1	1020	-	-	-	-	-
Stage 2	697	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	83	503	-	-	679	-
Stage 1	313	-	-	-	-	-
Stage 2	461	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	75	499	-	-	676	-
Mov Cap-2 Maneuver	197	-	-	-	-	-
Stage 1	312	-	-	-	-	-
Stage 2	420	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	197	499	676
HCM Lane V/C Ratio	-	-	0.122	0.109	0.088
HCM Control Delay (s)	-	-	25.8	13.1	10.8
HCM Lane LOS	-	-	D	B	B
HCM 95th %tile Q(veh)	-	-	0.4	0.4	0.3

Lanes, Volumes, Timings
 1: N Newport Hwy & E Hoerner St

08/09/2019



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	85	54	282	48	114	874
Future Volume (vph)	85	54	282	48	114	874
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	225	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25				25	
Link Speed (mph)	25		55			55
Link Distance (ft)	534		999			1650
Travel Time (s)	14.6		12.4			20.5
Confl. Peds. (#/hr)	3	7		3	7	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	8%	5%	20%	3%	2%
Shared Lane Traffic (%)						
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other

Control Type: Unsignalized

HCM 6th TWSC
 1: N Newport Hwy & E Hoerner St

08/09/2019

Intersection						
Int Delay, s/veh	2.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↗	↕↔		↙	↕↕
Traffic Vol, veh/h	85	54	282	48	114	874
Future Vol, veh/h	85	54	282	48	114	874
Conflicting Peds, #/hr	3	7	0	3	7	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	225	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	8	5	20	3	2
Mvmt Flow	90	57	300	51	121	930

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1043	190	0	0	358
Stage 1	333	-	-	-	-
Stage 2	710	-	-	-	-
Critical Hdwy	6.8	7.06	-	-	4.16
Critical Hdwy Stg 1	5.8	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-
Follow-up Hdwy	3.5	3.38	-	-	2.23
Pot Cap-1 Maneuver	228	801	-	-	1190
Stage 1	704	-	-	-	-
Stage 2	454	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	203	790	-	-	1182
Mov Cap-2 Maneuver	317	-	-	-	-
Stage 1	699	-	-	-	-
Stage 2	406	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.6	0	1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	317	790	1182
HCM Lane V/C Ratio	-	-	0.285	0.073	0.103
HCM Control Delay (s)	-	-	20.8	9.9	8.4
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.2	0.2	0.3

Lanes, Volumes, Timings
 1: N Newport Hwy & E Hoerner St

08/09/2019



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	60	82	940	70	93	1081
Future Volume (vph)	60	82	940	70	93	1081
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	225	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25				25	
Link Speed (mph)	25		55			55
Link Distance (ft)	534		999			1650
Travel Time (s)	14.6		12.4			20.5
Confl. Peds. (#/hr)	4	4		4	4	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Shared Lane Traffic (%)						
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other

Control Type: Unsignalized

HCM 6th TWSC
 1: N Newport Hwy & E Hoerner St

08/09/2019

Intersection

Int Delay, s/veh 1.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↕		↘	↕
Traffic Vol, veh/h	60	82	940	70	93	1081
Future Vol, veh/h	60	82	940	70	93	1081
Conflicting Peds, #/hr	4	4	0	4	4	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	225	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	1	0	0	1
Mvmt Flow	63	85	979	73	97	1126

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1781	534	0 0 1056 0
Stage 1	1020	-	- - - -
Stage 2	761	-	- - - -
Critical Hdwy	6.8	6.9	- - 4.1 -
Critical Hdwy Stg 1	5.8	-	- - - -
Critical Hdwy Stg 2	5.8	-	- - - -
Follow-up Hdwy	3.5	3.3	- - 2.2 -
Pot Cap-1 Maneuver	75	496	- - 667 -
Stage 1	313	-	- - - -
Stage 2	427	-	- - - -
Platoon blocked, %			- - - -
Mov Cap-1 Maneuver	64	492	- - 664 -
Mov Cap-2 Maneuver	182	-	- - - -
Stage 1	312	-	- - - -
Stage 2	363	-	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	22.7	0	0.9
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	182 492	664	-
HCM Lane V/C Ratio	-	-	0.343 0.174	0.146	-
HCM Control Delay (s)	-	-	34.8 13.8	11.3	-
HCM Lane LOS	-	-	D B	B	-
HCM 95th %tile Q(veh)	-	-	1.4 0.6	0.5	-