Kimley»Horn

MEMORANDUM

To: Kenneth Davis, P.E.
Vice President
Peloton Land Solutions, Inc.

From: Jeffrey Whitacre, P.E., AICP, PTP
Kimley-Horn and Associates, Inc.
TBPE Firm Number F-928

Date: February 19, 2019

Re: River Park Traffic Engineering Study
Fort Worth, Texas

PURPOSE

This memorandum serves as the traffic engineering study (TES) for the proposed River Park multifamily development located on the northwest corner of Bryant Irvin Road & River Park Drive in Fort Worth, Texas. The purpose of this study is to determine the safety, mobility, and operational impacts that the proposed development will have on the roadway system. The study will include:

- Existing Traffic Volumes;
- Anticipated Trip Generation;
- Projected Site Traffic Distribution and Assignment;
- Projected Build Out Traffic Volumes;
- Level of Service Evaluation;
- Auxiliary Lane Analysis;
- Sight Distance Analysis; and
- Access Spacing Analysis.

PROPOSED DEVELOPMENT

The proposed 6.52-acre site is currently zoned as a Zone “G”, Intensive Commercial, land use. The developer is submitting for a zoning request for Zone “UR,” Urban Residential, and is now proposing a multifamily residential development. A concept plan has been included in the **Appendix**.

The proposed River Park multifamily development is anticipated to have 270 dwelling units on site. The site is anticipated to be served by two (2) locations. One site access location is proposed along River Park Drive and is anticipated to be a full access drive. The other site access location is proposed along Bryant Irvin Road and is anticipated to be a right-in, right-out (RIRO) access drive.

EXISTING (2018) CONDITIONS

Both Bryant Irvin Road and River Park Drive are four-lane divided sections at their intersection. To the west, River Park Drive narrows to a four-lane undivided section.

The speed limit along Bryant Irving Road and River Park Drive is posted at 35 mph within the study area.

A peak hour turning movement count was collected at Bryant Irvin Road & River Park Drive on February 7, 2019. Based on this count, the AM peak hour occurs from 7:30 AM to 8:30 AM and the PM peak hour occurs from 5:00 PM to 6:00 PM.

The existing traffic volumes within the study area are presented in **Exhibit 1.** Raw traffic counts are provided in the **Appendix**.

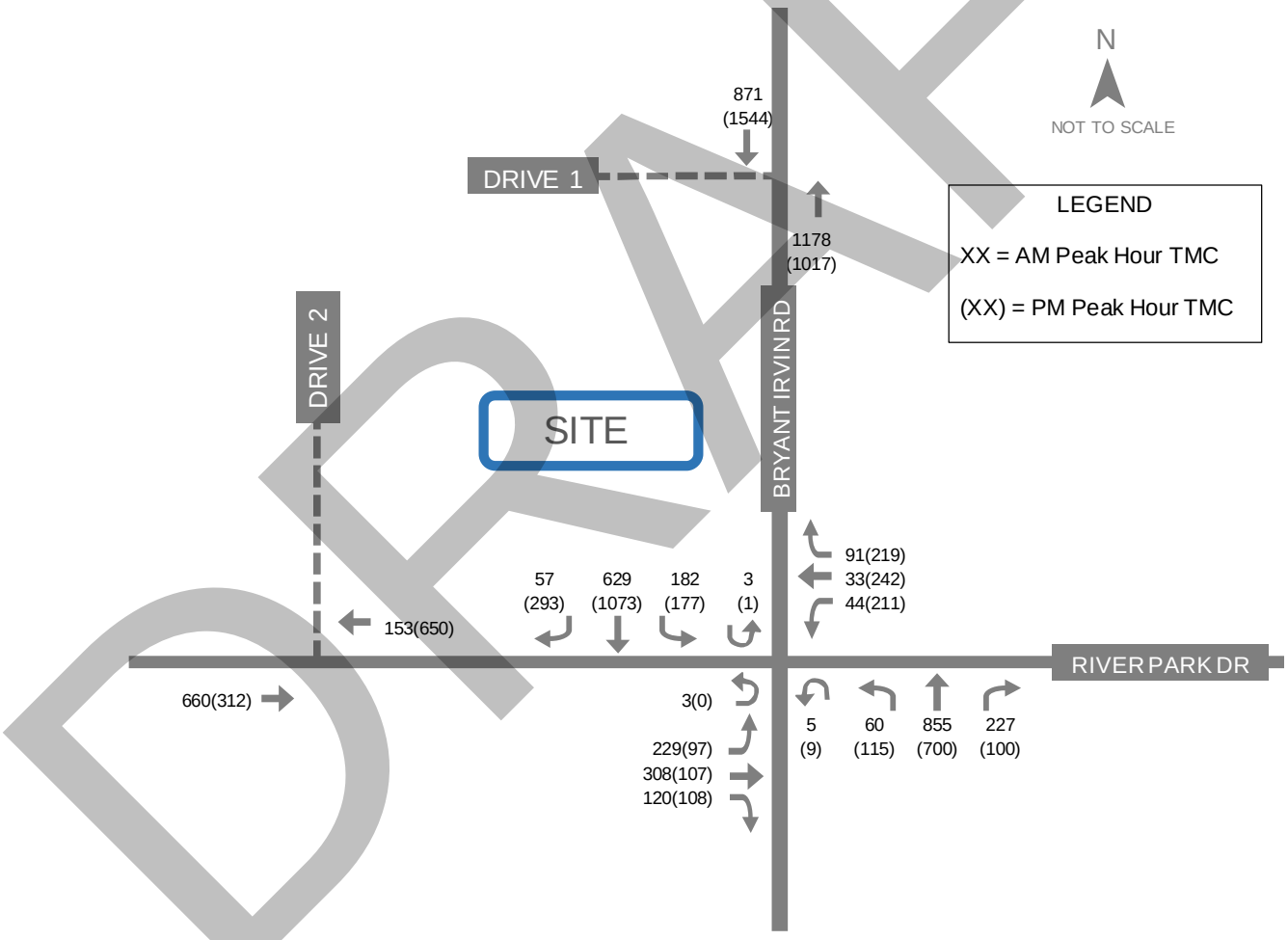

Exhibit 1: Existing Traffic Volumes

A tube count was collected for the southbound right-turn movement off of Bryant Irvin Road onto River Park Drive to collect the 85th percentile speed at which drivers are making this movement. Based on the data, the 85th percentile speed at which drivers are making this movement is 22 mph.

Additionally, any vegetation impeding the sight distance for the southbound right-turn movement off of Bryant Irvin Road and onto River Park Drive is recommended to be cleared.

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DEVELOPMENT OF BACKGROUND TRAFFIC

Based on counts provided by the Texas Department of Transportation (TxDOT) *Statewide Planning Map,* average daily traffic (ADT) counts from 2012 - 2017 along SH 183, west of Bryant Irvin Road, show a 1.8% average growth rate over the six (6) years of data. For this reason, a 2.0% compounding growth rate was assumed for two (2) years to account for background growth through the anticipated Build Out year, 2021.

Table 1 presents the historical count data along SH 183, west of Bryant Irvin Road, from 2012 - 2017.

Table 1: Historical Count Data

Year	SH 183, West of Bryant Irvin Rd	Annual Growth Rate
2012	40,000	-
2013	41,963	4.9%
2014	42,721	1.8%
2015	37,725	-11.7%
2016	37,995	0.7%
2017	43,000	13.2%
Average Growth Rate		**1.8%**

TRIP GENERATION

The River Park multifamily development is anticipated to have 270 mid-rise multifamily dwelling units on site. To estimate the trips generated by the development, trip generation rates from the 10th edition of the *ITE Trip Generation Manual* were used. **Table 2** shows the trip generation rates for the proposed land use.

Table 2: Trip Generation Rates

Land Use Description	Variable	Daily		AM Peak Hour		PM Peak Hour	
		Equation	Split	Equation	Split	Equation	Split
Multifamily Housing (Mid-Rise) (ITE #221)	Dwelling Units	5.44 * (X)	50% In 50% Out	0.36 * (X)	26% In 74% Out	0.44 * (X)	61% In 39% Out

X = Dwelling Units

Table 3 summarizes the total number of trips that are expected to be generated for the River Park multifamily development with an intensity of 270 dwelling units. The number of trips generated represents the number of vehicles entering and exiting the proposed development, to and from the adjacent street system.

Table 2: Trip Generation Analysis

Land Uses	Amount	Units	ITE Code	Daily One-Way Trips	AM Peak Hour One-Way Trips			PM Peak Hour One-Way Trips		
					IN	OUT	TOTAL	IN	OUT	TOTAL
Multifamily Housing (Mid-Rise)	270	Dwelling Units	221	1,469	25	72	97	73	46	119

TRIP DISTRIBUTION AND TRAFFIC ASSIGNMENT

The site is proposed with two (2) access connections; One (1) RIRO drive along Bryant Irvin Road and one (1) full access drive along River Park Drive.

The distribution favors the access along Bryant Irvin Road as residents who are attempting to access floors 2 – 4 are anticipated to use this access due to the parking garage design. **Exhibit 2** presents the inbound and outbound directional distribution percentages during the AM and PM peak hours for the development.

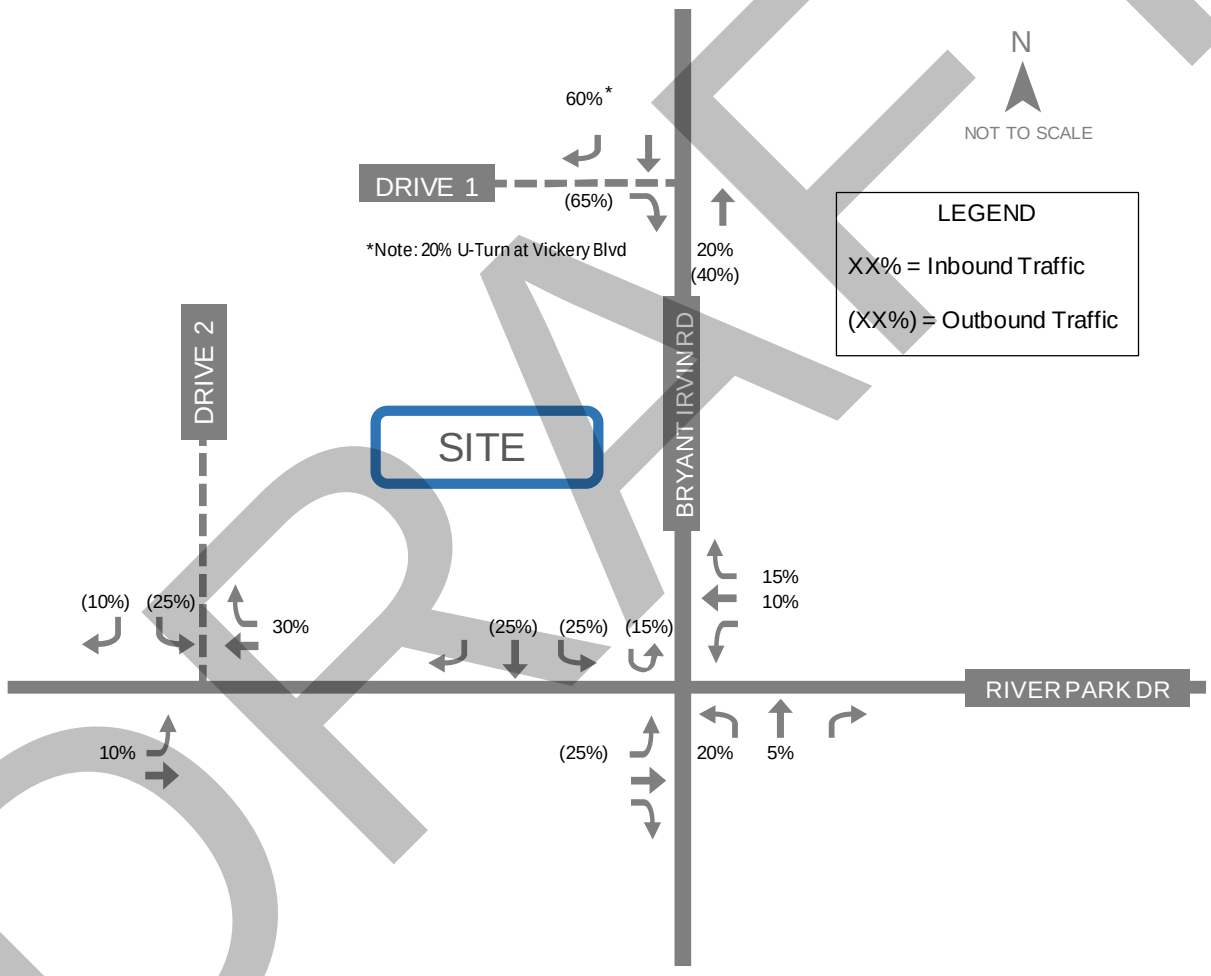


Exhibit 2: Trip Distribution

Exhibit 3 presents the associated site trip assignment during the AM and PM peak hours. The trip assignment is found by applying the anticipated trip generation to the projected trip distribution.

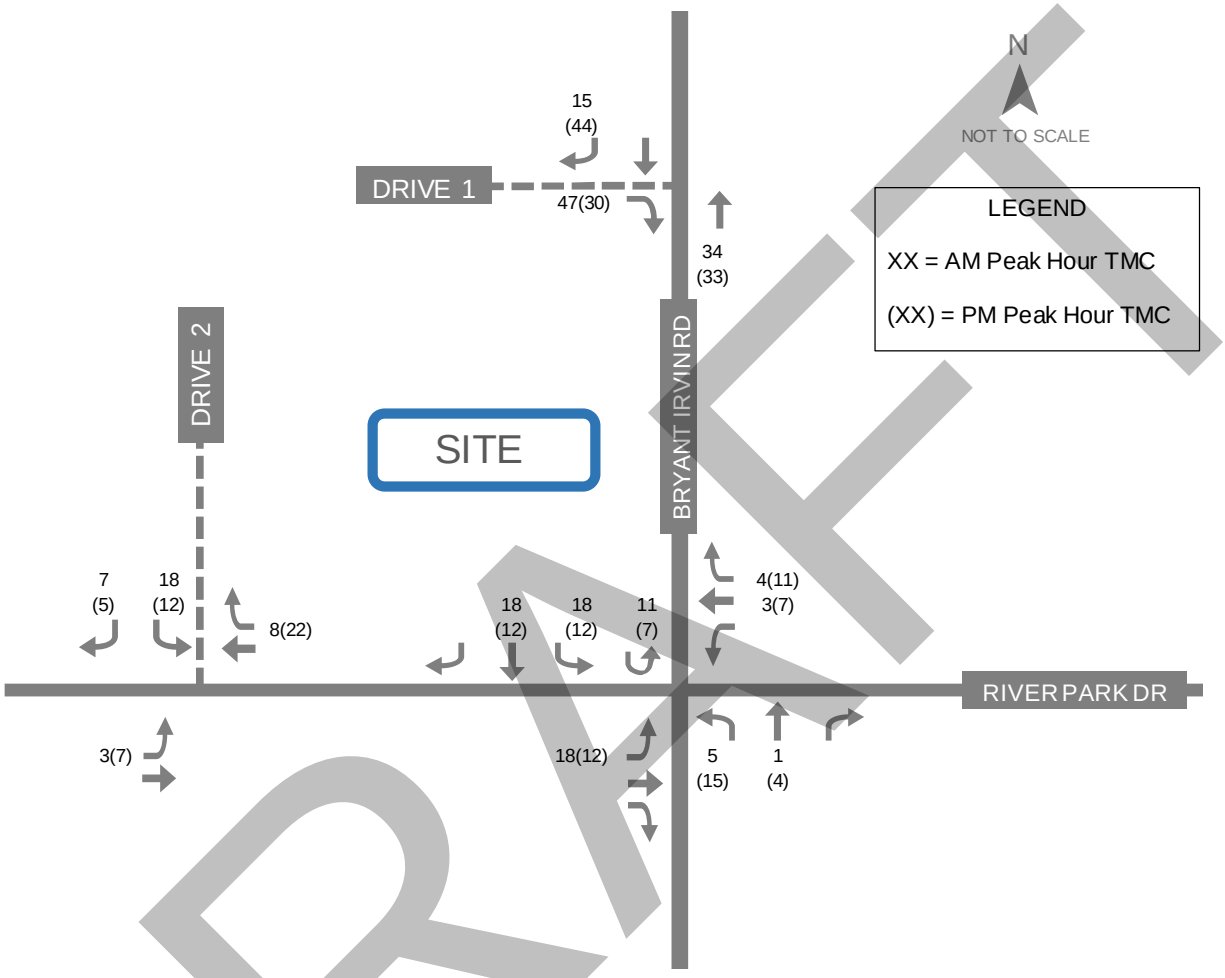


Exhibit 3: Trip Assignment

BUILD OUT CONDITIONS

The anticipated traffic volumes at Build Out of the River Park multifamily residential development are presented in **Exhibit 4**. These traffic volumes account for two years of background growth, along with the proposed development's site traffic.

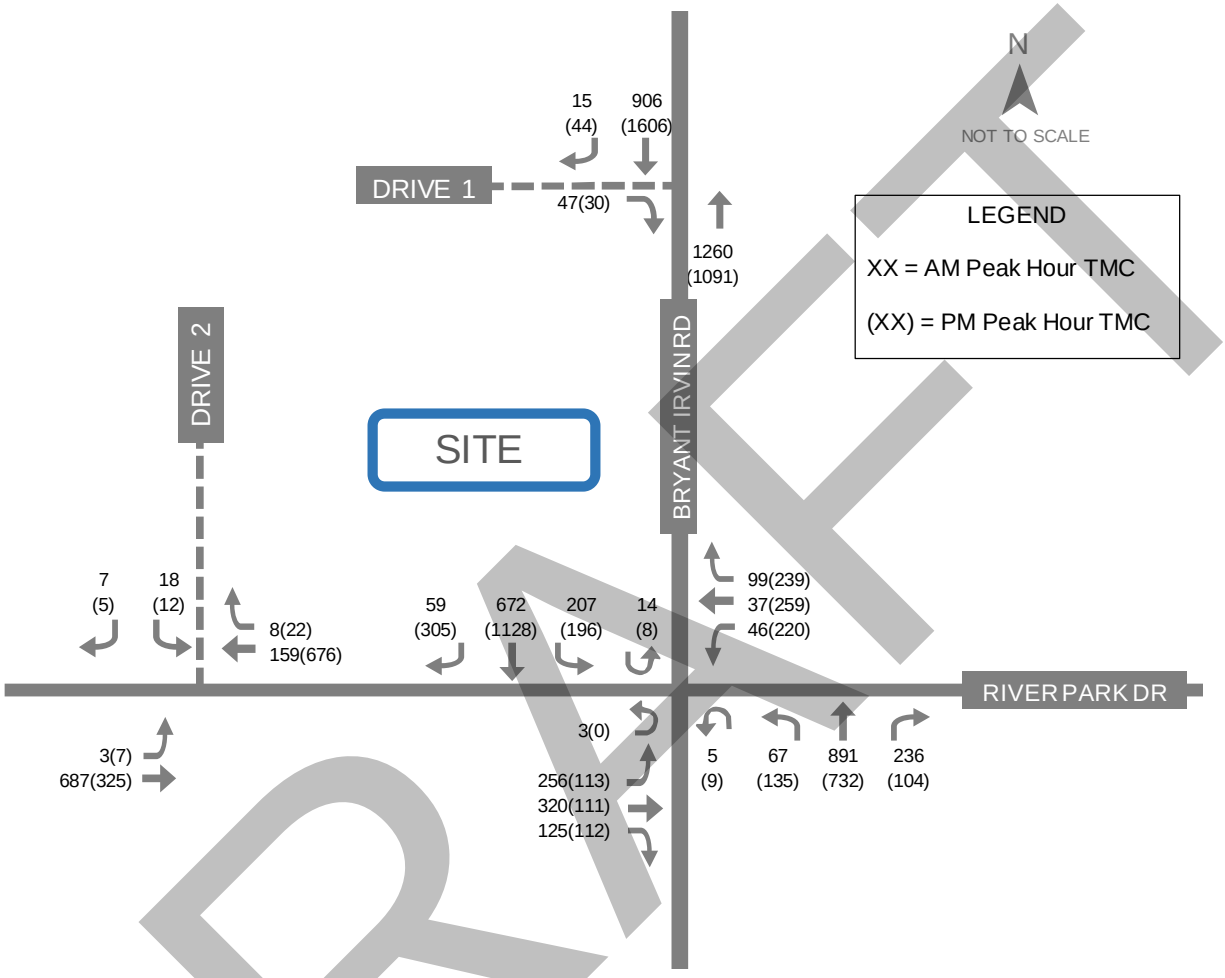


Exhibit 4: Build Out Volumes

Auxiliary Lane Analysis

Right-Turn Deceleration Lane

The City of Fort Worth's *Access Management Policy* sets forth criteria for the need of right-turn deceleration lanes. Criteria for the consideration of a right-turn deceleration lane is based on the major road volume and right-turn volume at Build Out. These criteria were used to determine if a southbound right-turn lane is warranted at the RIRO drive along the Bryant Irvin Road drive (Drive 1) and a westbound right-turn lane is warranted at the full access drive along River Park Drive (Drive 2).

Per the analysis conducted using Build Out volumes and Figure 4-1 of the *Access Management Policy*, it was determined that a right-turn deceleration lane is warranted for the southbound right-turn movements into Drive 1 during the PM peak hour.

The southbound right-turn lane is recommended to be designed for 35 mph while assuming a 20-mph speed reduction which can be accommodated for in a 150-foot right-turn lane (50-foot taper and 100-foot storage).

Level of Service Evaluations

An intersection level of service (LOS) analysis was performed using *Synchro 10™* software for the Bryant Irvin Road & River Park Drive intersection and each proposed access drive. This analysis was completed considering the Existing volumes and volumes projected at Build Out of the development and anticipated stop control at the proposed access drives. **Table 4** summarizes the findings of the analysis.

Table 4: Intersection LOS Analysis

INTERSECTION	MOVEMENT	Existing (2019)				Build Out (2021)			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		DELAY (Sec/Veh)	LOS	DELAY (Sec/Veh)	LOS	DELAY (Sec/Veh)	LOS	DELAY (Sec/Veh)	LOS
UNSIGNALIZED INTERSECTIONS									
Bryant Irvin Rd & Drive 1	EBR	N/A				12.6	B	18.8	C
River Park Dr & Drive 2	SBL					12.1	B	17.3	C
SIGNALIZED INTERSECTIONS									
Bryant Irvin Rd & River Park Dr	EB	49.9	D	74.6	E	49.4	D	37.2	D
	WB	39.4	D	63.4	E	39.3	D	33.5	C
	NB	26.3	C	20.0	B	38.1	D	25.0	C
	SB	17.7	B	21.7	C	19.1	B	29.8	C
	Overall	*29.9*	*C*	*34.1*	*C*	*34.9*	*C*	*29.9*	*C*

Based on the analysis, the Bryant Irvin Road & River Park Drive intersection is operating at an overall acceptable LOS during the AM and PM peak hours. During the PM peak hour, the minor street approaches (River Park Drive and Edwards Ranch Road) are operating at LOS E. It is anticipated that minor signal timing adjustments can bring the intersection's approaches back to acceptable levels, with the addition of the River Park multifamily developments site traffic.

Minor signal timing adjustments were made for the Bryant Irvin Road & River Park Drive intersection during the Build Out analysis. At Build Out, all study area intersections and approaches are anticipated to operate at acceptable LOS.

Synchro reports are provided in the **Appendix**.

Sight Distance Analysis

Based on field observations at the proposed access drives, the sight distance at the RIRO drive is recommended to be confirmed prior construction of the drive. Guidelines provided in AASHTO's *A Policy on Geometric Design of Highways and Streets* were used to determine adequacy of sight distance for the proposed access drives.

For roads like Bryant Irvin Road and River Park Drive with speed limits of 35 mph, the following sight distances should be provided:

- Left-turn from Stop (Case B1) = 390 feet
- Right-turn from Stop (Case B2) = 335 feet

It is recommended that all driveways be designed to provide adequate sight distance (i.e. clear sight with no obstructing object, signs, landscaping, etc.). A photolog of the proposed site access locations are provided in the **Appendix**.

Access Spacing Analysis

The site is anticipated to be served by two (2) locations. One site access location is proposed along River Park Drive and is anticipated to be a full access drive. The other site access location is proposed along Bryant Irvin Road and is anticipated to be a RIRO access drive. To evaluate access spacing, criteria from the City of Fort Worth's *Access Management Policy* were applied to the site access locations.

According to the City of Fort Worth's *Master Thoroughfare Plan*, River Park Drive is classified as a Neighborhood Collector and Bryant Irvin Road is classified as a Commercial Connector. **Table 5** provides the minimum spacing requirements for each roadway.

Table 5: Access Spacing

Street	Street Type	Spacing	
		Driveway to Driveway	Intersection to Driveway
River Park Dr	Neighborhood Connector	200 ft	250 ft
Bryant Irving Rd	Commercial Connector	250 ft	250 ft

All proposed access drive locations are anticipated to meet access spacing requirements with the following exception:

- Drive 2 along River Park Drive is anticipated to be approximately 135 feet east of the existing drive providing access to the Barden House development to the west. This does not meet the City's requirements for access spacing by 65 feet. It is recommended that a 65-foot variance be requested.

Recommendation for Channelized SBR

Based on the collected data, it was found that drivers are making the southbound right-turn movement off of Bryant Irvin Road onto River Park Drive at 22 mph. In order to provide for reduced speeds on this movement a raised cross walk is recommended.

Additionally, stopping sight distance and intersection sight distance were considered between the southbound right-turn at Bryant Irvin Road & River Park Drive and the anticipate location of a southbound left-turn at River Park Drive & Drive 2. The anticipated spacing between each of these movements is about 280 feet.

To be conservative, a speed of 25 mph was assumed when considering sight distance between the two movements. Based on guidelines provided by AASHTO, the intersection sight distance and stopping sight distance are recommended to be 280 feet and 155 feet, respectively. Based on the currently planned location of Drive 2, it is anticipated that adequate sight distance will be provided.

CONCLUSION AND RECOMMENDATIONS

Based on the review of the River Park multifamily residential development, the following conclusions and recommendations are provided:

- At Build Out, acceptable LOS is anticipated to be achieved with minor signal timing edits to Bryant Irvin Road and River Park Drive;
- At the RIRO drive along Bryant Irving Road, a southbound right-turn lane is warranted during the PM peak hour;
    - Recommended design length of 150 feet (50-foot taper and 100 feet of storage)
- Sight distance at the RIRO drive is recommended to be confirmed prior construction of the drive;
    - Sight distance of 335 feet is recommended.
- Consideration of a raised crosswalk along the southbound right-turn movement off of Bryant Irvin Road and onto River Park Drive;
- Any vegetation impeding the sight distance for the southbound right-turn movement off of Bryant Irvin Road and onto River Park Drive is recommended to be cleared; and
- A 65-foot variance is recommended to be requested at Drive 2 with the existing drive to the west.

If you have any questions, please contact me at jeff.whitacre@kimley-horn.com or by phone at 817-339-2254.

Appendix

Conceptual Site Plan

Raw Traffic Counts

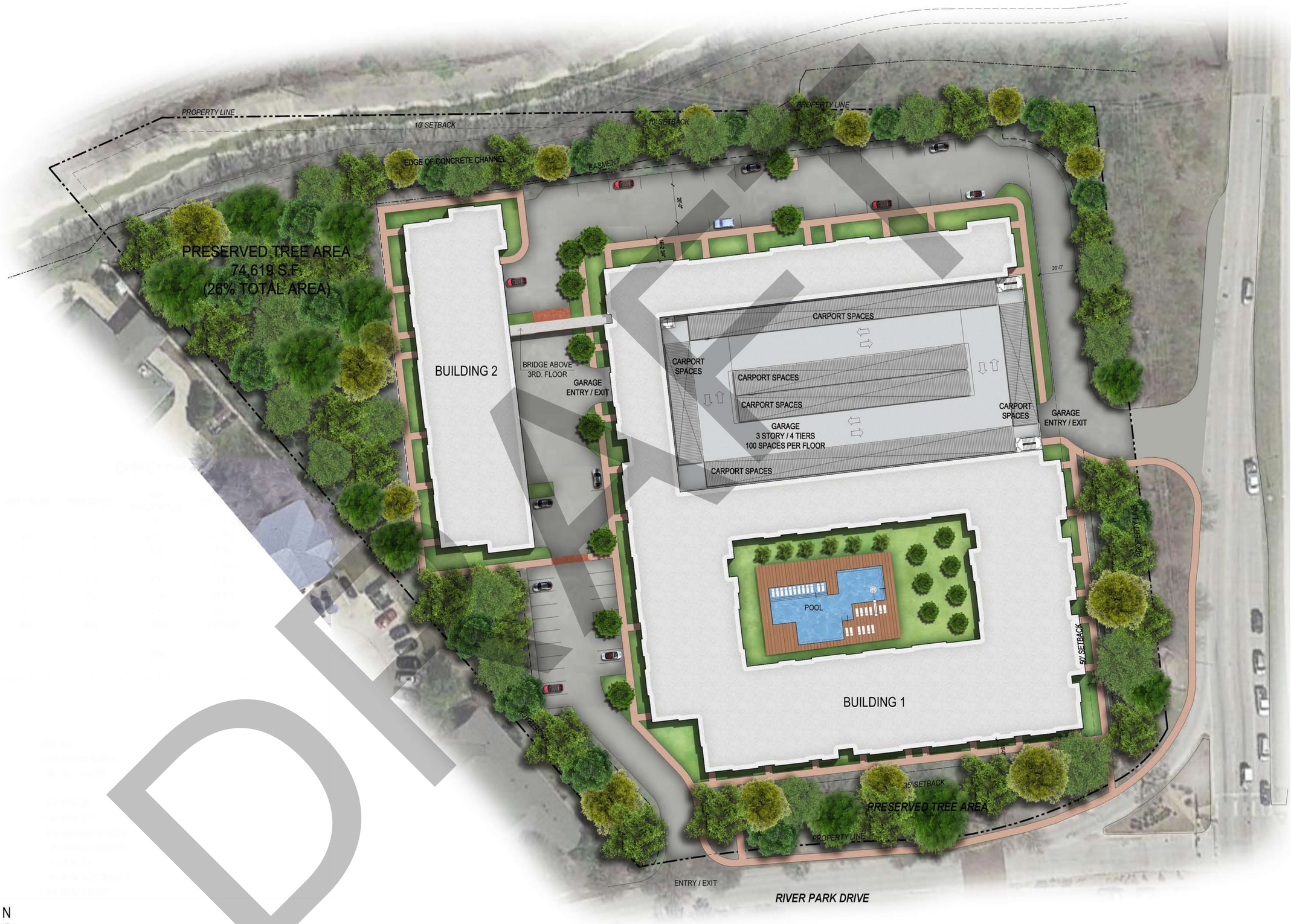
Build Out Analysis Reports

Photolog

Kimley»Horn

Conceptual Site Plan

kimley-horn.com | 801 Cherry Street, Unit 11 Suite 1300, Fort Worth, TX 76102 | 817-335-6511



SCALE: 1" = 30' - 0" (24"x36" SHEET)

0' 30' 60' 120'

N

A201

HUMPHREYS & PARTNERS ARCHITECTS, L.P.
5339 Alpha Rd., Suite 300, Dallas, TX 75240 | 972.701.9636 | www.humphreys.com

EMBREY

ARCHITECTURAL SITEPLAN
SCHEME 16
December 20, 2018

River Park
TARRANT COUNTRY, TX
HPA# 18153

Kimley»Horn

Raw Traffic Counts

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: BRYANT IRVIN RD @ RIVER PARK DR
Site Code:
Start Date: 02/07/2019

Turning Movement Data

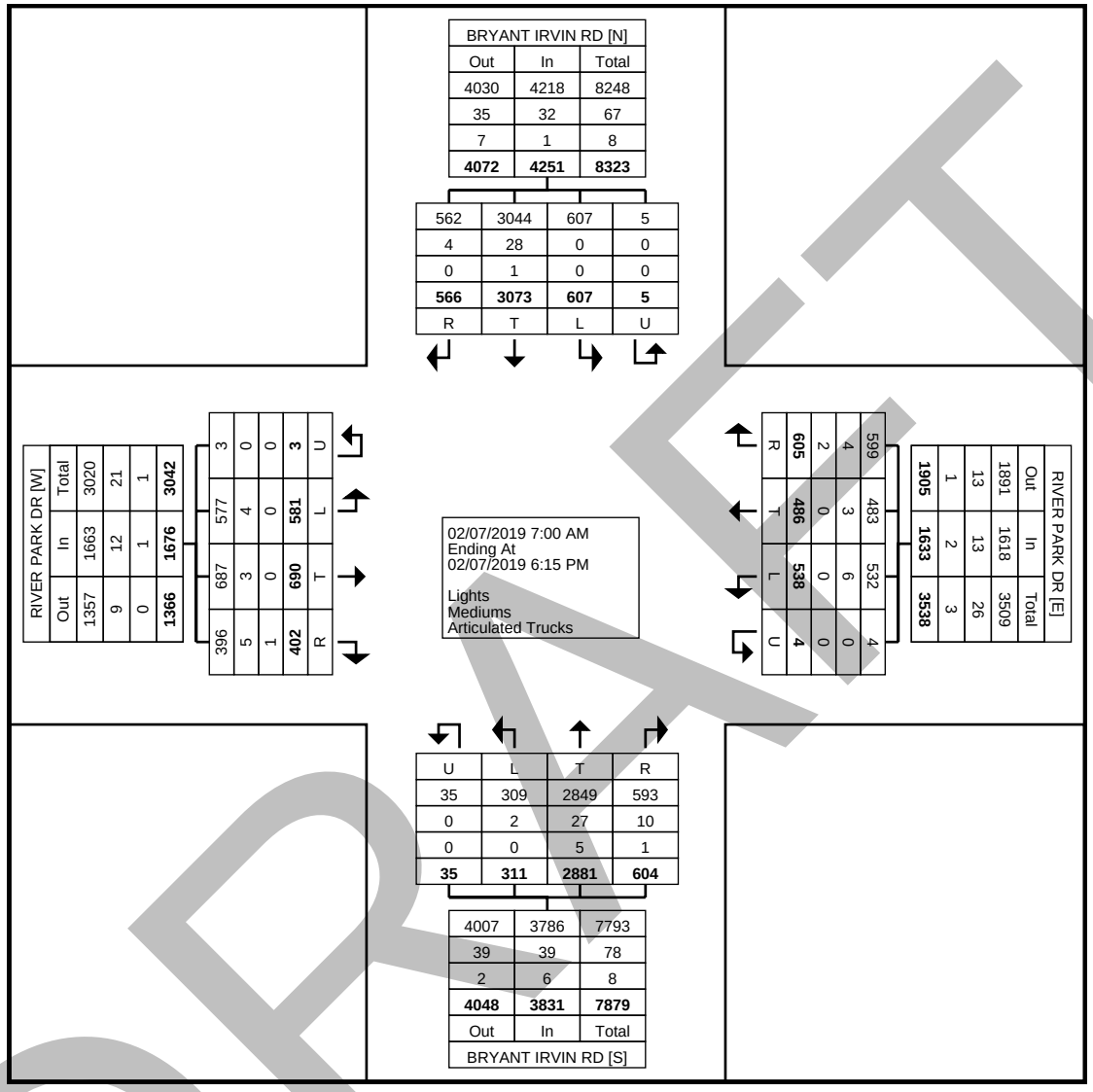
Start Time	BRYANT IRVIN RD Southbound					RIVER PARK DR Westbound					BRYANT IRVIN RD Northbound					RIVER PARK DR Eastbound					
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
7:00 AM	28	66	9	0	103	9	4	19	0	32	5	125	34	1	165	47	35	9	0	91	391
7:15 AM	22	104	13	0	139	11	7	19	0	37	5	197	42	0	244	60	52	22	0	134	554
7:30 AM	31	168	14	1	214	8	7	24	0	39	9	239	49	1	298	69	58	32	0	159	710
7:45 AM	59	191	10	2	262	11	6	16	0	33	18	226	63	1	308	75	110	35	0	220	823
Hourly Total	140	529	46	3	718	39	24	78	0	141	37	787	188	3	1015	251	255	98	0	604	2478
8:00 AM	49	123	16	0	188	16	14	21	0	51	21	190	62	1	274	43	79	32	3	157	670
8:15 AM	43	147	17	0	207	9	6	30	0	45	12	200	53	2	267	42	61	21	0	124	643
8:30 AM	43	122	11	0	176	16	13	25	2	56	7	160	37	0	204	36	54	21	0	111	547
8:45 AM	23	140	11	0	174	13	13	27	0	53	9	170	42	2	223	45	51	26	0	122	572
Hourly Total	158	532	55	0	745	54	46	103	2	205	49	720	194	5	968	166	245	100	3	514	2432
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	2
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	2
4:00 PM	28	229	36	0	293	62	36	75	1	174	24	188	24	6	242	11	17	22	0	50	759
4:15 PM	32	226	45	0	303	53	40	43	0	136	26	159	37	4	226	14	22	21	0	57	722
4:30 PM	36	256	42	0	334	56	37	39	1	133	22	168	35	4	229	22	18	27	0	67	763
4:45 PM	36	228	48	1	313	63	61	48	0	172	38	159	24	4	225	20	26	24	0	70	780
Hourly Total	132	939	171	1	1243	234	174	205	2	615	110	674	120	18	922	67	83	94	0	244	3024
5:00 PM	43	262	84	0	389	79	88	72	0	239	24	174	30	4	232	23	21	19	0	63	923
5:15 PM	44	326	74	1	445	30	65	55	0	150	29	202	22	1	254	20	26	26	0	72	921
5:30 PM	44	237	72	0	353	56	50	45	0	151	30	159	15	2	206	24	29	34	0	87	797
5:45 PM	46	248	63	0	357	46	39	47	0	132	32	165	33	2	232	30	31	29	0	90	811
Hourly Total	177	1073	293	1	1544	211	242	219	0	672	115	700	100	9	924	97	107	108	0	312	3452
6:00 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	3
Grand Total	607	3073	566	5	4251	538	486	605	4	1633	311	2881	604	35	3831	581	690	402	3	1676	11391
Approach %	14.3	72.3	13.3	0.1	-	32.9	29.8	37.0	0.2	-	8.1	75.2	15.8	0.9	-	34.7	41.2	24.0	0.2	-	-
Total %	5.3	27.0	5.0	0.0	37.3	4.7	4.3	5.3	0.0	14.3	2.7	25.3	5.3	0.3	33.6	5.1	6.1	3.5	0.0	14.7	-
Lights	607	3044	562	5	4218	532	483	599	4	1618	309	2849	593	35	3786	577	687	396	3	1663	11285
% Lights	100.0	99.1	99.3	100.0	99.2	98.9	99.4	99.0	100.0	99.1	99.4	98.9	98.2	100.0	98.8	99.3	99.6	98.5	100.0	99.2	99.1
Mediums	0	28	4	0	32	6	3	4	0	13	2	27	10	0	39	4	3	5	0	12	96
% Mediums	0.0	0.9	0.7	0.0	0.8	1.1	0.6	0.7	0.0	0.8	0.6	0.9	1.7	0.0	1.0	0.7	0.4	1.2	0.0	0.7	0.8
Articulated Trucks	0	1	0	0	1	0	0	2	0	2	0	5	1	0	6	0	0	1	0	1	10
% Articulated Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.1	0.0	0.2	0.2	0.0	0.2	0.0	0.0	0.2	0.0	0.1	0.1

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: BRYANT IRVIN RD @ RIVER PARK DR
Site Code:
Start Date: 02/07/2019
Page No: 2



Turning Movement Data Plot

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: BRYANT IRVIN RD @ RIVER PARK DR
Site Code:
Start Date: 02/07/2019

Turning Movement Peak Hour Data (7:30 AM)

Start Time	BRYANT IRVIN RD Southbound					RIVER PARK DR Westbound					BRYANT IRVIN RD Northbound					RIVER PARK DR Eastbound					
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
7:30 AM	31	168	14	1	214	8	7	24	0	39	9	239	49	1	298	69	58	32	0	159	710
7:45 AM	59	191	10	2	262	11	6	16	0	33	18	226	63	1	308	75	110	35	0	220	823
8:00 AM	49	123	16	0	188	16	14	21	0	51	21	190	62	1	274	43	79	32	3	157	670
8:15 AM	43	147	17	0	207	9	6	30	0	45	12	200	53	2	267	42	61	21	0	124	643
Total	182	629	57	3	871	44	33	91	0	168	60	855	227	5	1147	229	308	120	3	660	2846
Approach %	20.9	72.2	6.5	0.3	-	26.2	19.6	54.2	0.0	-	5.2	74.5	19.8	0.4	-	34.7	46.7	18.2	0.5	-	-
Total %	6.4	22.1	2.0	0.1	30.6	1.5	1.2	3.2	0.0	5.9	2.1	30.0	8.0	0.2	40.3	8.0	10.8	4.2	0.1	23.2	-
PHF	0.771	0.823	0.838	0.375	0.831	0.688	0.589	0.758	0.000	0.824	0.714	0.894	0.901	0.625	0.931	0.763	0.700	0.857	0.250	0.750	0.865
Lights	182	623	57	3	865	44	33	87	0	164	59	843	225	5	1132	228	306	117	3	654	2815
% Lights	100.0	99.0	100.0	100.0	99.3	100.0	100.0	95.6	-	97.6	98.3	98.6	99.1	100.0	98.7	99.6	99.4	97.5	100.0	99.1	98.9
Mediums	0	6	0	0	6	0	0	2	0	2	1	11	2	0	14	1	2	2	0	5	27
% Mediums	0.0	1.0	0.0	0.0	0.7	0.0	0.0	2.2	-	1.2	1.7	1.3	0.9	0.0	1.2	0.4	0.6	1.7	0.0	0.8	0.9
Articulated Trucks	0	0	0	0	0	0	0	2	0	2	0	1	0	0	1	0	0	1	0	1	4
% Articulated Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	-	1.2	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.8	0.0	0.2	0.1

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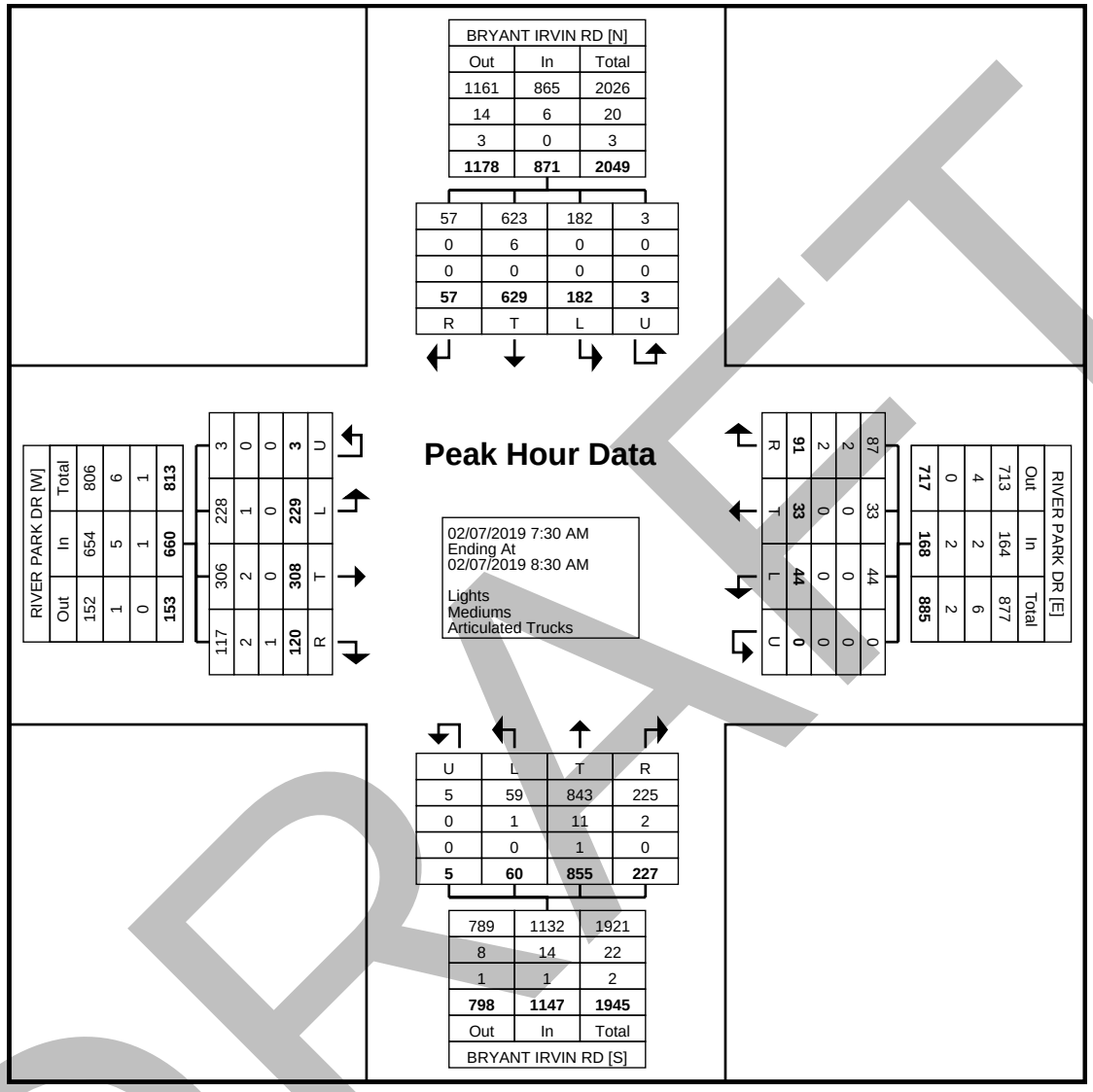


Turning Movement Peak Hour Data Plot (7:30 AM)

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: BRYANT IRVIN RD @ RIVER PARK DR
Site Code:
Start Date: 02/07/2019

Turning Movement Peak Hour Data (5:00 PM)

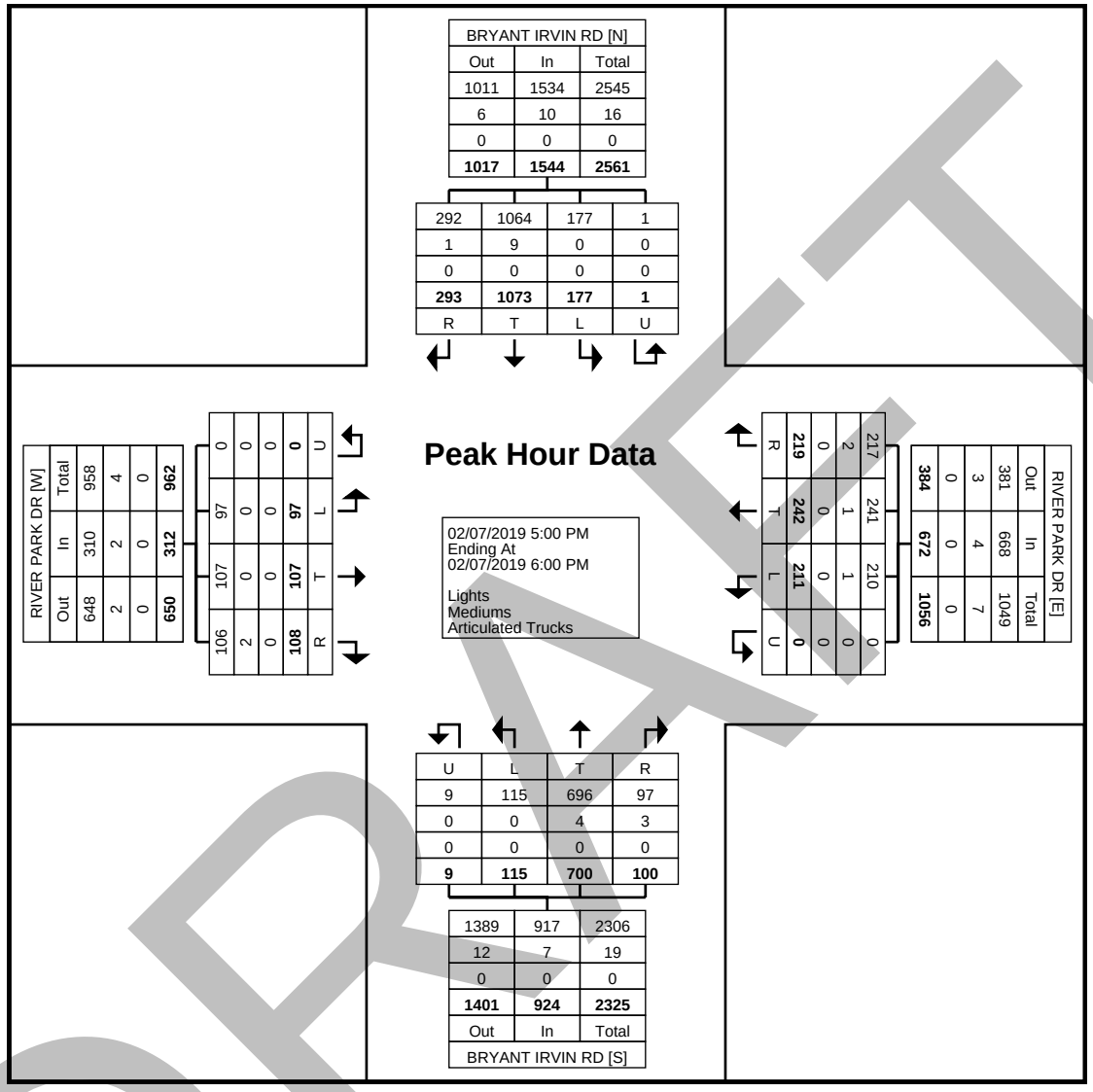
Start Time	BRYANT IRVIN RD Southbound					RIVER PARK DR Westbound					BRYANT IRVIN RD Northbound					RIVER PARK DR Eastbound					
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
5:00 PM	43	262	84	0	389	79	88	72	0	239	24	174	30	4	232	23	21	19	0	63	923
5:15 PM	44	326	74	1	445	30	65	55	0	150	29	202	22	1	254	20	26	26	0	72	921
5:30 PM	44	237	72	0	353	56	50	45	0	151	30	159	15	2	206	24	29	34	0	87	797
5:45 PM	46	248	63	0	357	46	39	47	0	132	32	165	33	2	232	30	31	29	0	90	811
Total	177	1073	293	1	1544	211	242	219	0	672	115	700	100	9	924	97	107	108	0	312	3452
Approach %	11.5	69.5	19.0	0.1	-	31.4	36.0	32.6	0.0	-	12.4	75.8	10.8	1.0	-	31.1	34.3	34.6	0.0	-	-
Total %	5.1	31.1	8.5	0.0	44.7	6.1	7.0	6.3	0.0	19.5	3.3	20.3	2.9	0.3	26.8	2.8	3.1	3.1	0.0	9.0	-
PHF	0.962	0.823	0.872	0.250	0.867	0.668	0.688	0.760	0.000	0.703	0.898	0.866	0.758	0.563	0.909	0.808	0.863	0.794	0.000	0.867	0.935
Lights	177	1064	292	1	1534	210	241	217	0	668	115	696	97	9	917	97	107	106	0	310	3429
% Lights	100.0	99.2	99.7	100.0	99.4	99.5	99.6	99.1	-	99.4	100.0	99.4	97.0	100.0	99.2	100.0	100.0	98.1	-	99.4	99.3
Mediums	0	9	1	0	10	1	1	2	0	4	0	4	3	0	7	0	0	2	0	2	23
% Mediums	0.0	0.8	0.3	0.0	0.6	0.5	0.4	0.9	-	0.6	0.0	0.6	3.0	0.0	0.8	0.0	0.0	1.9	-	0.6	0.7
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: BRYANT IRVIN RD @ RIVER PARK DR
Site Code:
Start Date: 02/07/2019
Page No: 6



Turning Movement Peak Hour Data Plot (5:00 PM)

GRAM Traffic North Texas, Inc.

1120 W. Lovers Lane
Arlington, TX 76013

RIVER PARK DR W OF BRYANT IRVIN RD SB to WB RIGHT TURN LANE - SPEED WITH 4 SEC FILTER

Site Code:

Date Start: 15-Feb-19

SB-WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
02/15/19	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	11	**49**	21	**2**	0	0	0	0	0	0	0	0	0	0	83	22	24
13:00	**18**	43	**29**	2	0	0	0	0	0	0	0	0	0	0	**92**	22	24
14:00	18	49	22	2	0	0	0	0	0	0	0	0	0	0	91	22	24
15:00	12	32	27	0	0	0	0	0	0	0	0	0	0	0	71	23	24
Total	59	173	99	6	0	0	0	0	0	0	0	0	0	0	337		
Percent	17.5%	51.3%	29.4%	1.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak Vol.																	
PM Peak Vol.	13:00 18	12:00 49	13:00 29	12:00 2											13:00 92		
Total	59	173	99	6	0	0	0	0	0	0	0	0	0	0	337		
Percent	17.5%	51.3%	29.4%	1.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

	15th Percentile :	12 MPH
	50th Percentile :	18 MPH
	85th Percentile :	22 MPH
	95th Percentile :	24 MPH
Stats	10 MPH Pace Speed :	16-25 MPH
	Number in Pace :	272
	Percent in Pace :	80.7%
	Number of Vehicles > 55 MPH :	0
	Percent of Vehicles > 55 MPH :	0.0%
	Mean Speed(Average) :	18 MPH

Kimley»Horn

Build Out Analysis Reports

kimley-horn.com | 801 Cherry Street, Unit 11 Suite 1300, Fort Worth, TX 76102 | 817-335-6511

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	3	229	308	120	44	33	91	5	60	855	227	3
Future Volume (vph)	3	229	308	120	44	33	91	5	60	855	227	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	
Lane Util. Factor		1.00	1.00	1.00	1.00	0.95	1.00		1.00	0.95	1.00	
Frt		1.00	1.00	0.85	1.00	1.00	0.85		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		1770	1863	1583	1770	3539	1583		1770	3539	1583	
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00		0.36	1.00	1.00	
Satd. Flow (perm)		1770	1863	1583	1770	3539	1583		666	3539	1583	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	3	263	354	138	51	38	105	6	69	983	261	3
RTOR Reduction (vph)	0	0	0	110	0	0	97	0	0	0	129	0
Lane Group Flow (vph)	0	266	354	28	51	38	8	0	75	983	132	0
Turn Type	Split	Split	NA	Perm	Split	NA	Perm	pm+pt	pm+pt	NA	Perm	pm+pt
Protected Phases	4	4	4		8	8		5	5	2		1
Permitted Phases				4			8	2	2		2	6
Actuated Green, G (s)		18.4	18.4	18.4	7.0	7.0	7.0		39.5	33.3	33.3	
Effective Green, g (s)		18.4	18.4	18.4	7.0	7.0	7.0		39.5	33.3	33.3	
Actuated g/C Ratio		0.20	0.20	0.20	0.08	0.08	0.08		0.44	0.37	0.37	
Clearance Time (s)		4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		361	380	323	137	275	123		368	1309	585	
v/s Ratio Prot		0.15	c0.19		c0.03	0.01			0.01	c0.28		
v/s Ratio Perm				0.02			0.01		0.08		0.08	
v/c Ratio		0.74	0.93	0.09	0.37	0.14	0.07		0.20	0.75	0.23	
Uniform Delay, d1		33.5	35.2	29.0	39.4	38.7	38.5		14.8	24.7	19.5	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2		7.6	29.3	0.1	1.7	0.2	0.2		0.3	4.0	0.9	
Delay (s)		41.2	64.5	29.1	41.1	38.9	38.7		15.1	28.7	20.4	
Level of Service		D	E	C	D	D	D		B	C	C	
Approach Delay (s)			49.9			39.4				26.3		
Approach LOS			D			D				C		

Intersection Summary			
HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	182	629	57
Future Volume (vph)	182	629	57
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583
Flt Permitted	0.12	1.00	1.00
Satd. Flow (perm)	214	3539	1583
Peak-hour factor, PHF	0.87	0.87	0.87
Adj. Flow (vph)	209	723	66
RTOR Reduction (vph)	0	0	36
Lane Group Flow (vph)	212	723	30
Turn Type	pm+pt	NA	Perm
Protected Phases	1	6	
Permitted Phases	6		6
Actuated Green, G (s)	51.1	40.4	40.4
Effective Green, g (s)	51.1	40.4	40.4
Actuated g/C Ratio	0.57	0.45	0.45
Clearance Time (s)	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0
Lane Grp Cap (vph)	351	1588	710
v/s Ratio Prot	c0.09	0.20	
v/s Ratio Perm	0.25		0.02
v/c Ratio	0.60	0.46	0.04
Uniform Delay, d1	14.3	17.2	13.9
Progression Factor	1.00	1.00	1.00
Incremental Delay, d2	2.9	0.9	0.1
Delay (s)	17.2	18.1	14.0
Level of Service	B	B	B
Approach Delay (s)		17.7	
Approach LOS		B	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	97	107	108	211	242	219	9	115	700	100	1	177
Future Volume (vph)	97	107	108	211	242	219	9	115	700	100	1	177
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00		1.00	0.95	1.00		1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00		0.95
Satd. Flow (prot)	1770	1863	1583	1770	3539	1583		1770	3539	1583		1770
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.17	1.00	1.00		0.30
Satd. Flow (perm)	1770	1863	1583	1770	3539	1583		313	3539	1583		556
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	103	114	115	224	257	233	10	122	745	106	1	188
RTOR Reduction (vph)	0	0	104	0	0	194	0	0	0	35	0	0
Lane Group Flow (vph)	103	114	11	224	257	39	0	132	745	71	0	189
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	pm+pt	NA	Perm	pm+pt	pm+pt
Protected Phases	4	4		8	8		5	5	2		1	1
Permitted Phases			4			8	2	2		2	6	6
Actuated Green, G (s)	14.7	14.7	14.7	26.9	26.9	26.9		98.7	88.4	88.4		102.1
Effective Green, g (s)	14.7	14.7	14.7	26.9	26.9	26.9		98.7	88.4	88.4		102.1
Actuated g/C Ratio	0.09	0.09	0.09	0.17	0.17	0.17		0.62	0.55	0.55		0.64
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	162	171	145	297	594	266		286	1955	874		445
v/s Ratio Prot	0.06	c0.06		c0.13	0.07			0.03	0.21			c0.03
v/s Ratio Perm			0.01			0.02		0.25		0.04		0.24
v/c Ratio	0.64	0.67	0.07	0.75	0.43	0.15		0.46	0.38	0.08		0.42
Uniform Delay, d1	70.1	70.3	66.4	63.4	59.7	56.8		16.3	20.3	16.8		13.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Incremental Delay, d2	7.9	9.4	0.2	10.4	0.5	0.3		1.2	0.6	0.2		0.7
Delay (s)	78.0	79.7	66.6	73.8	60.2	57.0		17.5	20.9	17.0		13.7
Level of Service	E	E	E	E	E	E		B	C	B		B
Approach Delay (s)		74.6			63.4				20.0			
Approach LOS		E			E				B			

Intersection Summary			
HCM 2000 Control Delay	34.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1073	293
Future Volume (vph)	1073	293
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	4.5
Lane Util. Factor	0.95	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	3539	1583
Flt Permitted	1.00	1.00
Satd. Flow (perm)	3539	1583
Peak-hour factor, PHF	0.94	0.94
Adj. Flow (vph)	1141	312
RTOR Reduction (vph)	0	66
Lane Group Flow (vph)	1141	246
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Actuated Green, G (s)	90.1	90.1
Effective Green, g (s)	90.1	90.1
Actuated g/C Ratio	0.56	0.56
Clearance Time (s)	4.5	4.5
Vehicle Extension (s)	3.0	3.0
Lane Grp Cap (vph)	1992	891
v/s Ratio Prot	c0.32	
v/s Ratio Perm		0.16
v/c Ratio	0.57	0.28
Uniform Delay, d1	22.5	18.1
Progression Factor	1.00	1.00
Incremental Delay, d2	1.2	0.8
Delay (s)	23.7	18.9
Level of Service	C	B
Approach Delay (s)	21.7	
Approach LOS	C	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	3	256	320	125	46	37	99	5	67	891	236	14
Future Volume (vph)	3	256	320	125	46	37	99	5	67	891	236	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	
Lane Util. Factor		1.00	1.00	1.00	1.00	0.95	1.00		1.00	0.95	1.00	
Frt		1.00	1.00	0.85	1.00	1.00	0.85		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		1770	1863	1583	1770	3539	1583		1770	3539	1583	
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00		0.36	1.00	1.00	
Satd. Flow (perm)		1770	1863	1583	1770	3539	1583		669	3539	1583	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	3	294	368	144	53	43	114	6	77	1024	271	16
RTOR Reduction (vph)	0	0	0	113	0	0	105	0	0	0	137	0
Lane Group Flow (vph)	0	297	368	31	53	43	9	0	83	1024	134	0
Turn Type	Split	Split	NA	Perm	Split	NA	Perm	pm+pt	pm+pt	NA	Perm	pm+pt
Protected Phases	4	4	4		8	8		5	5	2		1
Permitted Phases				4			8	2	2		2	6
Actuated Green, G (s)		19.2	19.2	19.2	7.1	7.1	7.1		34.7	28.3	28.3	
Effective Green, g (s)		19.2	19.2	19.2	7.1	7.1	7.1		34.7	28.3	28.3	
Actuated g/C Ratio		0.21	0.21	0.21	0.08	0.08	0.08		0.39	0.31	0.31	
Clearance Time (s)		4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		377	397	337	139	279	124		336	1112	497	
v/s Ratio Prot		0.17	c0.20		c0.03	0.01			0.02	c0.29		
v/s Ratio Perm				0.02			0.01		0.08		0.08	
v/c Ratio		0.79	0.93	0.09	0.38	0.15	0.07		0.25	0.92	0.27	
Uniform Delay, d1		33.5	34.7	28.4	39.4	38.6	38.4		17.8	29.8	23.1	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2		10.4	27.4	0.1	1.7	0.3	0.2		0.4	13.6	1.3	
Delay (s)		43.9	62.1	28.5	41.1	38.9	38.6		18.2	43.4	24.4	
Level of Service		D	E	C	D	D	D		B	D	C	
Approach Delay (s)			49.4			39.3				38.1		
Approach LOS			D			D				D		

Intersection Summary			
HCM 2000 Control Delay	34.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	207	672	59
Future Volume (vph)	207	672	59
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583
Flt Permitted	0.12	1.00	1.00
Satd. Flow (perm)	227	3539	1583
Peak-hour factor, PHF	0.87	0.87	0.87
Adj. Flow (vph)	238	772	68
RTOR Reduction (vph)	0	0	38
Lane Group Flow (vph)	254	772	30
Turn Type	pm+pt	NA	Perm
Protected Phases	1	6	
Permitted Phases	6		6
Actuated Green, G (s)	50.2	39.3	39.3
Effective Green, g (s)	50.2	39.3	39.3
Actuated g/C Ratio	0.56	0.44	0.44
Clearance Time (s)	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0
Lane Grp Cap (vph)	424	1545	691
v/s Ratio Prot	c0.12	0.22	
v/s Ratio Perm	0.22		0.02
v/c Ratio	0.60	0.50	0.04
Uniform Delay, d1	17.0	18.3	14.6
Progression Factor	1.00	1.00	1.00
Incremental Delay, d2	2.3	1.2	0.1
Delay (s)	19.3	19.4	14.7
Level of Service	B	B	B
Approach Delay (s)		19.1	
Approach LOS		B	

Intersection Summary

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	47	0	1260	906	15
Future Vol, veh/h	0	47	0	1260	906	15
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	-	-	-	150
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	51	0	1370	985	16

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	493	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	522	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	522	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	522	-	-
HCM Lane V/C Ratio	-	0.098	-	-
HCM Control Delay (s)	-	12.6	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.3	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	687	159	8	18	7
Future Vol, veh/h	3	687	159	8	18	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	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	3	747	173	9	20	8

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	182	0	-	0	558	91
Stage 1	-	-	-	-	178	-
Stage 2	-	-	-	-	380	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1391	-	-	-	460	949
Stage 1	-	-	-	-	835	-
Stage 2	-	-	-	-	661	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1391	-	-	-	458	949
Mov Cap-2 Maneuver	-	-	-	-	458	-
Stage 1	-	-	-	-	832	-
Stage 2	-	-	-	-	661	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	12.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1391	-	-	-	536
HCM Lane V/C Ratio	0.002	-	-	-	0.051
HCM Control Delay (s)	7.6	0	-	-	12.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	113	111	112	220	259	239	9	135	732	104	8	196
Future Volume (vph)	113	111	112	220	259	239	9	135	732	104	8	196
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00		1.00	0.95	1.00		1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00		0.95
Satd. Flow (prot)	1770	1863	1583	1770	3539	1583		1770	3539	1583		1770
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.12	1.00	1.00		0.20
Satd. Flow (perm)	1770	1863	1583	1770	3539	1583		231	3539	1583		377
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	120	118	119	234	276	254	10	144	779	111	9	209
RTOR Reduction (vph)	0	0	104	0	0	204	0	0	0	71	0	0
Lane Group Flow (vph)	120	118	15	234	276	50	0	154	779	40	0	218
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	pm+pt	NA	Perm	pm+pt	pm+pt
Protected Phases	4	4		8	8		5	5	2		1	1
Permitted Phases			4			8	2	2		2	6	6
Actuated Green, G (s)	11.6	11.6	11.6	17.6	17.6	17.6		40.4	32.2	32.2		45.2
Effective Green, g (s)	11.6	11.6	11.6	17.6	17.6	17.6		40.4	32.2	32.2		45.2
Actuated g/C Ratio	0.13	0.13	0.13	0.20	0.20	0.20		0.45	0.36	0.36		0.50
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5		4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	228	240	204	346	692	309		243	1266	566		353
v/s Ratio Prot	c0.07	0.06		c0.13	0.08			0.06	0.22			c0.07
v/s Ratio Perm			0.01			0.03		0.23		0.03		0.24
v/c Ratio	0.53	0.49	0.08	0.68	0.40	0.16		0.63	0.62	0.07		0.62
Uniform Delay, d1	36.6	36.5	34.5	33.6	31.6	30.1		18.6	23.8	19.0		14.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Incremental Delay, d2	2.2	1.6	0.2	5.2	0.4	0.2		5.3	2.2	0.2		3.2
Delay (s)	38.8	38.0	34.6	38.7	32.0	30.3		23.9	26.0	19.3		17.8
Level of Service	D	D	C	D	C	C		C	C	B		B
Approach Delay (s)		37.2			33.5				25.0			
Approach LOS		D			C				C			

Intersection Summary			
HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1128	305
Future Volume (vph)	1128	305
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.5	4.5
Lane Util. Factor	0.95	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	3539	1583
Flt Permitted	1.00	1.00
Satd. Flow (perm)	3539	1583
Peak-hour factor, PHF	0.94	0.94
Adj. Flow (vph)	1200	324
RTOR Reduction (vph)	0	127
Lane Group Flow (vph)	1200	197
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Actuated Green, G (s)	34.6	34.6
Effective Green, g (s)	34.6	34.6
Actuated g/C Ratio	0.38	0.38
Clearance Time (s)	4.5	4.5
Vehicle Extension (s)	3.0	3.0
Lane Grp Cap (vph)	1360	608
v/s Ratio Prot	c0.34	
v/s Ratio Perm		0.12
v/c Ratio	0.88	0.32
Uniform Delay, d1	25.8	19.5
Progression Factor	1.00	1.00
Incremental Delay, d2	8.5	1.4
Delay (s)	34.4	20.9
Level of Service	C	C
Approach Delay (s)	29.8	
Approach LOS	C	

Intersection Summary

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	30	0	1091	1606	44
Future Vol, veh/h	0	30	0	1091	1606	44
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	-	-	-	150
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	33	0	1186	1746	48

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	873	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	293	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	293	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	293	-	-
HCM Lane V/C Ratio	-	0.111	-	-
HCM Control Delay (s)	-	18.8	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0.4	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	325	676	22	12	5
Future Vol, veh/h	7	325	676	22	12	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	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	8	353	735	24	13	5

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	759	0	-	0	940	380
Stage 1	-	-	-	-	747	-
Stage 2	-	-	-	-	193	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	848	-	-	-	262	618
Stage 1	-	-	-	-	429	-
Stage 2	-	-	-	-	821	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	848	-	-	-	259	618
Mov Cap-2 Maneuver	-	-	-	-	259	-
Stage 1	-	-	-	-	424	-
Stage 2	-	-	-	-	821	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	17.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	848	-	-	-	312
HCM Lane V/C Ratio	0.009	-	-	-	0.059
HCM Control Delay (s)	9.3	0.1	-	-	17.3
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Kimley»Horn

Photolog

Drive 1 looking North

Drive 2 looking West

Drive 2 looking East