



LEE ENGINEERING

memorandum

TO: Mary K. Hamann, PE
Engineer
Public Works, City of New Braunfels

FROM: James A. Robertson, PhD, PE, PTOE, RSP
Project Manager
Lee Engineering

RE: Multiway Stop Control Warrant Study Results Summary
Oak Run Parkway and Westpointe Drive, New Braunfels, Texas

DATE: February 22, 2019

Lee Engineering has completed a multiway stop control warrant analysis for the intersection of Oak Run Parkway and Westpointe Drive in New Braunfels, Texas. The study was completed for the Task Order #12 – All-way Stop Control Analysis. At this time, Oak Run Parkway and Westpointe Drive operates as a one-way stop control intersection, with a stop sign on the northbound approach of Westpointe Drive.

The multiway stop control warrant analysis was conducted using 24-hour approach volumes collected on Thursday, January 31, 2019.

Based on the existing traffic volumes and this multiway stop control warrant analysis, all-way stop warrants are not satisfied for the intersection of Oak Run Parkway and Westpointe Drive. Additionally, the intersection of Oak Run Parkway and Westpointe Drive does not meet any additional criteria for the potential installation of a multiway stop. A summary of the results is shown in the table below:

Warrant	Warrant Met?	Notes
A – Interim measure until signal installation	NO	Traffic signal is not planned
B – Crash Warrant	NO	Crash history does not meet warrants
C & D – Minimum Traffic Volumes	NO	Average volumes do not exceed requirements

A multiway stop is NOT recommended at this intersection at this time.

Please see the attached study for further detail. If you have any questions regarding this study, please contact me at (210) 561-5411. We appreciate the opportunity to provide these services.

All-Way Stop Control Warrant Analysis Task Order #12 – All-way Stop Control Analysis

Oak Run Parkway and Westpointe Drive City of New Braunfels, Texas

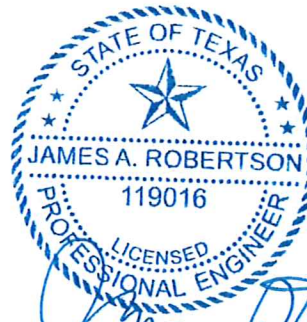
Prepared for:
City of New Braunfels
Public Works
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New Braunfels, Texas 78130

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2/22/19

February 2019

SA133.12

INTRODUCTION

The City of New Braunfels has requested that an analysis be conducted to determine if multiway stop control is warranted at the intersection of Oak Run Parkway and Westpointe Drive. This report summarizes the results of the multiway stop control warrant analysis conducted for this intersection.

The analysis was performed using existing turning movement volumes collected over a 24-hour period on Thursday, January 31, 2019, which are summarized in **Table 1**, with the raw data presented in the Appendix.

The analysis is based on the multiway stop control warrants contained in Chapter 2B, “Regulatory Signs”, of the *2011 Texas Manual on Uniform Traffic Control Devices (Texas MUTCD)*. Three warranting criteria are included in the *Texas MUTCD* for multiway stop sign installation. These warrants are:

- A. Installing multiway stop control as an interim measure while arrangements are being made for a traffic signal installation;
- B. A crash warrant; and
- C & D. Minimum traffic volumes.

Oak Run Parkway is a four-lane divided roadway with a posted speed limit of 30 miles per hour (mph). At the study intersection, Oak Run Parkway is an eastbound-westbound roadway with two through lanes in each direction and a left turn lane on the eastbound approach of Westpointe Drive. Westpointe Drive is a two-lane undivided roadway with a posted speed limit of 30 mph. At the study intersection, Westpointe Drive is a northbound-southbound roadway with one lane in each direction. The intersection of these two streets consists of three approaches, the eastbound and westbound approaches of Oak Run Parkway, and the northbound approach of Westpointe Drive. Currently, the intersection is stop-controlled on the Westpointe Drive approach. Based on the traffic volumes at this intersection, Oak Run Parkway is considered the *Major Roadway* for this analysis with multi-lane approaches (two lanes in each direction). Westpointe Drive will be considered a *Minor Roadway* with a single lane approach. An aerial photograph of the intersection is provided in **Figure 1**.

Table 1: Volume Summary

Hour Begin	Oak Run Parkway			Westpointe Drive		
	EB Volume	WB Volume	Total Volume	NB Volume	SB Volume	Total Volume
0:00	7	19	26	2	---	2
1:00	4	8	12	0	---	0
2:00	1	6	7	1	---	1
3:00	1	6	7	6	---	6
4:00	8	5	13	9	---	9
5:00	26	12	38	30	---	30
6:00	101	70	171	80	---	80
7:00	226	248	474	111	---	111
8:00	219	231	450	93	---	93
9:00	140	146	286	67	---	67
10:00	133	169	302	62	---	62
11:00	156	200	356	62	---	62
12:00	181	206	387	82	---	82
13:00	144	225	369	75	---	75
14:00	163	242	405	73	---	73
15:00	204	264	468	60	---	60
16:00	217	348	565	78	---	78
17:00	225	388	613	84	---	84
18:00	134	250	384	73	---	73
19:00	68	189	257	32	---	32
20:00	47	128	175	15	---	15
21:00	26	82	108	18	---	18
22:00	12	55	67	6	---	6
23:00	2	32	34	5	---	5
TOTAL	2,445	3,529	5,974	1,124	0	1,124

*Highlighted cells indicate the highest 8 hours of major street traffic volumes entering the intersection.

Figure 1: Oak Run Parkway at Westpointe Drive



MULTIWAY STOP CONTROL WARRANT ANALYSIS

Warrant A

The first warrant allows for multiway stop control as an interim measure to control traffic while arrangements are being made for a traffic signal installation, if the traffic signal is warranted and urgently needed. Since a traffic signal has not been warranted at the intersection and it does not appear that the current volumes would meet one of the first two signal warrants for the intersection, Warrant A is NOT met for the intersection of Oak Run Parkway and Westpointe Drive.

Warrant B

Warrant B is satisfied when five or more reported crashes, of the type susceptible to correction by a multiway stop control installation, have occurred within a 12-month period. Crash data for the study intersection was obtained from the TxDOT Crash Records Information System (C.R.I.S) for the most recent 36-month period. Based on the crash records provided by the City of New Braunfels, 3 crash occurred within the most recent 36-month period, with a only 1 correctible crash occurring within a 12-month period. Therefore, Warrant B is NOT met for the intersection of Oak Run Parkway and Westpointe Drive.

Warrants C & D

Warrants C & D are based on minimum traffic volumes and delays. Both warrants must be met in order to justify an all-way stop.

Warrant C. The total vehicular volume entering the intersection from the major street approaches (total of both approaches) must average at least 300 vehicles per hour (vph) for any eight (8) hours of an average day, and

Warrant D. The combined vehicular, pedestrian, and bicycle volume from the minor street must average at least 200 units per hour for the same eight (8) hours, with an average delay to minor street vehicular traffic of at least 30 seconds per vehicle during the maximum hour.

These criteria may be reduced to 70 percent of the above requirements when the 85th percentile speed exceeds 40 mph on the major street. Since the 85th percentile speed on the major street (Oak Run Parkway) is less than 40 mph (30 mph), the reduced warranting threshold was not used for this warrant. The hourly traffic volumes were summarized in Table 1 and included in the Appendix.

The eight (8) hourly periods with the highest number of vehicles entering the intersection were identified and noted in Table 1. The average major street vehicular volume entering each intersection was calculated and compared to the criteria contained in Warrant C. **Table 2** summarizes the peak hour and average total vehicular volume entering the intersection from the major street and compares these values to the criteria in Warrant C.

Table 2: Major Street (Oak Run Parkway) Traffic Volumes

Intersection	Volumes (vph)			
	Peak Hour	8 Hour Average	Warrant C	
			Requirement	Met?
Oak Run Parkway and Westpointe Drive	5:00 p.m.	460	300	YES

Based on the collected data, the average eight (8) hour major street vehicular volume entering this intersection (460 vph) does meet the minimum volume criteria (300 vph) identified in Warrant C.

The average minor street entering volumes were also determined for the same eight (8) hours and compared to the criteria contained in Warrant D. **Table 3** summarizes the average hourly volume entering the intersection from the minor street and compares the values to the criteria in Warrant D.

Table 3: Minor Street (Westpointe Drive) Traffic Volumes

Intersection	Volumes (vph)			
	Peak Hour	8 Hour Average	Warrant D	
			Requirement	Met?
Oak Run Parkway and Westpointe Drive	7:00 a.m.	82	200	No

Based on the results shown in Table 3, the average eight (8) hour minor street volume entering the intersection (82 vph) does not satisfy the minimum volume criteria (200 vph) identified in Warrant D. Because Warrant D did not meet the minimum volume criteria, further evaluation of average minor street delay was not performed.

Given the existing traffic volumes at the study intersection, Warrants C & D are NOT satisfied for the intersection of Oak Run Parkway and Westpointe Drive.

Optional Considerations for Multiway Stop Control Studies

In addition to the warrants above, the *Texas MUTCD* (Sec. 2B.07) allows for other criteria to be considered for the potential installation of a multiway stop. This includes the need to control left-turning conflicts, control vehicle and pedestrian conflicts near locations that generate high pedestrian volumes, provide safe turning movements where sight visibility is an issue, improve traffic operational characteristics of the intersection, or identify priority at “an intersection of two residential neighborhood collector (through) streets of similar design and operating characteristics where multiway stop control would improve traffic operational characteristics of the intersection.”

Oak Run Parkway and Westpointe Drive are similar in that they both operate as collector streets. Neither street has houses fronting it; however, Westpointe Drive is stop-controlled and functions

minor collector street. Oak Run Parkway functions as a major collector street and connects two highways, carrying higher volumes than Westpointe Drive.

Sight Distance

As part of this study, sight distance on the minor street (Westpointe Drive) approach to the intersection was assessed. On the stop-controlled approaches, the motorist should be able to see if and when adequate gaps exist to perform their desired maneuver.

The sight distance required for the stop-controlled approaches was estimated using the procedures developed by the American Association of State Highway and Transportation Officials (AASHTO) and published in the 2011 edition of *A Policy on Geometric Design of Highways and Streets*, as provided on the City of New Braunfels field assessment form. **Table 4** presents the required and available sight distance for vehicles turning onto Oak Run Parkway at Westpointe Drive.

Table 4: Sight Distance Evaluation

Major Roadway	Oak Run Parkway
Posted Speed Limit	30 mph
Minor Roadway	Westpointe Drive
Approach	Northbound
Required Intersection Sight Distance to the Left (Right turn from stop)	290 feet
Required Intersection Sight Distance to the Right (Left turn or through from stop)	335 feet
Available Sight Distance to the Left	300 feet
Available Sight Distance to the Right	425 feet
Sight Distance Available > Required	
To the Left	Yes
To the Right	Yes

As shown in Table 4 and based on a comparison of the field investigation results, the required sight distance is currently available for the northbound approach of Westpointe Drive at Oak Run Parkway.

CONCLUSION

Based on the existing traffic volumes and this multiway stop control warrant analysis, warrants are not satisfied for the intersection of Oak Run Parkway and Westpointe Drive. A summary of the multiway stop-control warrants is provided in **Table 5**.

Table 5: Warrant Summary – Oak Run Parkway and Westpointe Drive

Warrant	Warrant Met?	Notes
A – Interim measure until signal installation	NO	Traffic signal is not planned
B – Crash Warrant	NO	Crash history does not meet warrants
C & D – Minimum Traffic Volumes	NO	Average volumes do not exceed requirements

Additionally, the intersection of Oak Run Parkway and Westpointe Drive does not meet any additional criteria for the potential installation of a multiway stop. Based on the existing volumes, lack of reported accidents, and the *Texas MUTCD* allowances for other criteria, **a multiway stop is NOT recommended at this intersection at this time.**

If you have any comments or questions regarding this study, please feel free to contact us at your convenience.

APPENDIX

Oak Run @ Westpointe - TMC

Thu Jan 31, 2019

Full Length (12 AM-12 AM (+1))

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 616231, Location: 29.713044, -98.166212, Site Code: 1



Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave.,
Pasadena, TX, 77503, US

Leg Direction	Neighborhood Entr / Ext Southbound						Oak Run Pkwy Westbound						Westpointe Dr Northbound						Oak Run Pkwy Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2019-01-31 12:00AM	0	0	0	0	0	0	0	2	2	0	4	0	1	0	0	0	1	0	0	1	0	0	1	0	6
12:15AM	0	0	0	0	0	0	0	5	3	0	8	0	1	0	0	0	1	0	0	3	0	0	3	0	12
12:30AM	0	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	0	1	0	0	1	0	3
12:45AM	0	0	0	0	0	0	0	3	2	0	5	0	0	0	0	0	0	0	0	2	0	0	2	0	7
Hourly Total	0	0	0	0	0	0	0	11	8	0	19	0	2	0	0	0	2	0	0	7	0	0	7	0	28
1:00AM	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
1:15AM	0	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	0	3	0	0	3	0	5
1:30AM	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	2
1:45AM	0	0	0	0	0	0	0	3	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Hourly Total	0	0	0	0	0	0	0	5	3	0	8	0	0	0	0	0	0	0	0	4	0	0	4	0	12
2:00AM	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
2:15AM	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2:30AM	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	1	0	0	1	0	3
2:45AM	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	2
Hourly Total	0	0	0	0	0	0	0	3	3	0	6	0	1	0	0	0	1	0	0	1	0	0	1	0	8
3:00AM	0	0	0	0	0	0	0	1	0	0	1	0	1	0	1	0	2	0	0	0	0	0	0	0	3
3:15AM	0	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
3:30AM	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	2
3:45AM	0	0	0	0	0	0	0	1	1	0	2	0	3	0	0	0	3	0	0	1	0	0	1	0	6
Hourly Total	0	0	0	0	0	0	0	3	3	0	6	0	4	0	2	0	6	0	0	1	0	0	1	0	13
4:00AM	0	0	0	0	0	0	0	0	3	0	3	0	3	0	0	0	3	0	0	1	0	0	1	0	7
4:15AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	2	0	0	2	0	3
4:30AM	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	0	3	0	0	3	0	6
4:45AM	0	0	0	0	0	0	0	1	1	0	2	0	2	0	0	0	2	0	0	2	0	0	2	0	6
Hourly Total	0	0	0	0	0	0	0	1	4	0	5	0	8	0	1	0	9	0	0	8	0	0	8	0	22
5:00AM	0	0	0	0	0	0	0	3	0	0	3	0	4	0	2	0	6	0	0	5	0	0	5	0	14
5:15AM	0	0	0	0	0	0	0	1	2	0	3	0	8	0	0	0	8	0	0	2	0	0	2	0	13
5:30AM	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	6	0	0	7	0	0	7	0	13
5:45AM	0	0	0	0	0	0	0	4	2	0	6	0	8	0	2	0	10	0	0	12	0	0	12	0	28
Hourly Total	0	0	0	0	0	0	0	8	4	0	12	0	26	0	4	0	30	0	0	26	0	0	26	0	68
6:00AM	0	0	0	0	0	0	0	4	4	0	8	0	14	0	2	0	16	0	0	27	0	0	27	0	51
6:15AM	0	0	0	0	0	2	0	8	4	1	13	0	12	0	4	1	17	3	1	24	0	0	25	0	55
6:30AM	0	0	0	0	0	0	0	10	5	0	15	0	20	0	5	0	25	0	2	17	0	0	19	0	59
6:45AM	0	0	0	0	0	0	0	24	10	0	34	0	14	0	8	0	22	0	3	27	0	0	30	0	86
Hourly Total	0	0	0	0	0	2	0	46	23	1	70	0	60	0	19	1	80	3	6	95	0	0	101	0	251
7:00AM	0	0	0	0	0	0	0	39	4	0	43	0	12	0	9	0	21	3	2	39	0	0	41	0	105
7:15AM	0	0	0	0	0	0	0	45	4	0	49	0	21	0	12	0	33	0	2	52	0	0	54	0	136
7:30AM	0	0	0	0	0	0	0	55	11	0	66	0	23	0	3	0	26	0	5	60	0	0	65	0	157
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Hourly Total	0	0	0	0	0	0	0	219	29	0	248	0	83	0	28	0	111	3	9	217	0	0	226	0	585
8:00AM	0	0	0	0	0	0	0	59	14	0	73	0	16	0	5	0	21	0	2	64	0	0	66	0	160
8:15AM	0	0	0	0	0	1	0	40	14	0	54	0	19	0	5	0	24	0	3	55	0	0	58	0	136
8:30AM	0	0	0	0	0	0	0	41	20	0	61	0	13	0	9	0	22	0	1	54	0	0	55	0	138
8:45AM	0	0	0	0	0	0	0	26	17	0	43	0	17	0	9	0	26	0	0	40	0	0	40	0	109
Hourly Total	0	0	0	0	0	1	0	166	65	0	231	0	65	0	28	0	93	0	6	213	0	0	219	0	543
9:00AM	0	0	0	0	0	0	0	27	8	1	36	0	11	0	3	0	14	0	0	23	0	0	23	1	73
9:15AM	0	0	0	0	0	0	0	25	6	0	31	0	19	0	2	0	21	0	4	39	0	1	44	0	96
9:30AM	0	0	0	0	0	0	0	20	12	0	32	0	10	0	4	0	14	1	0	37	0	0	37	0	83
9:45AM	0	0	0	0	0	0	0	30	17	0	47	0	14	0	4	0	18	0	6	30	0	0	36	0	101
Hourly Total	0	0	0	0	0	0	0	102	43	1	146	0	54	0	13	0	67	1	10	129	0	1	140	1	353
10:00AM	0	0	0	0	0	1	0	39	11	0	50	0	10	0	3	0	13	1	0	18	0	0	18	4	81
10:15AM	0	0	0	0	0	0	0	24	14	0	38	0	14	0	4	0	18	0	1	32	0	0	33	0	89
10:30AM	0	0	0	0	0	0	0	29	12	0	41	0	11	0	2	0	13	0	3	32	0	0	35	0	89
10:45AM	0	0	0	0	0	0	0	28	12	0	40	0	13	0	5	0	18	0	3	43	0	1	47	0	105
Hourly Total	0	0	0	0	0	1	0	120	49	0	169	0	48	0	14	0	62	1	7	125	0	1	133	4	364
11:00AM	0	0	0	0	0	0	0	25	14	1	40	0	12	0	0	0	12	0	4	41	0	0	45	0	97
11:15AM	0	0	0	0	0	0	0	38	20	0	58	0	11	0	3	0	14	0	2	34	0	0	36	0	108
11:30AM	0	0	0	0	0	0	0	35	18	0	53	0	19	0	3	0	22	0	5	30	0	0	35	0	110
11:45AM	0	0	0	0	0	0	0	33	16	0	49	0	13	0	1	0	14	0	2	38	0	0	40	0	103
Hourly Total	0	0	0	0	0	0	0	131	68	1	200	0	55	0	7	0	62	0	13	143	0	0	156	0	418
12:00PM	0	0	0	0	0	0	0	28	21	0	49	0	17	0	3	0	20	0	4	49	0	0	53	0	122
12:15PM	0	0	0	0	0	0	0	33	21	0	54	0	18	0	1	0	19	0	4	34	0	0	38	0	111
12:30PM	0	0	0	0	0	0	0	26	18	0	44	0	18	0	1	0	19	1	3	40	0	0	43	2	106

Leg Direction	Neighborhood Entr / Ext Southbound							Oak Run Pkwy Westbound							Westpointe Dr Northbound							Oak Run Pkwy Eastbound							
Time	R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		Int
12:45PM	0	0	0	0	0	0	0	0	41	18	0	59	0	0	19	0	5	0	24	0	0	3	44	0	0	47	0	0	130
Hourly Total	0	0	0	0	0	0	0	0	128	78	0	206	0	0	72	0	10	0	82	1	0	14	167	0	0	181	2	0	469
1:00PM	0	0	0	0	0	0	2	0	35	15	0	50	0	0	14	0	2	0	16	0	0	4	30	0	0	34	1	0	100
1:15PM	0	0	0	0	0	0	0	0	36	23	0	59	0	0	10	0	2	0	12	0	0	1	32	0	0	33	0	0	104
1:30PM	0	0	0	0	0	0	0	0	35	17	1	53	0	0	17	0	6	0	23	1	0	4	39	0	0	43	1	0	119
1:45PM	0	0	0	0	0	0	0	0	37	26	0	63	0	0	19	0	5	0	24	0	0	3	31	0	0	34	0	0	121
Hourly Total	0	0	0	0	0	0	2	0	143	81	1	225	0	0	60	0	15	0	75	1	0	12	132	0	0	144	2	0	444
2:00PM	0	0	0	0	0	0	2	0	46	14	0	60	0	0	16	0	4	0	20	0	0	1	23	0	0	24	0	0	104
2:15PM	0	0	0	0	0	0	0	0	40	33	0	73	0	0	16	0	5	0	21	0	0	3	46	0	0	49	0	0	143
2:30PM	0	0	0	0	0	0	0	0	36	10	0	46	0	0	16	0	2	0	18	0	0	2	32	0	0	34	0	0	98
2:45PM	0	0	0	0	0	0	0	0	50	13	0	63	0	0	10	0	3	1	14	0	0	7	49	0	0	56	0	0	133
Hourly Total	0	0	0	0	0	0	2	0	172	70	0	242	0	0	58	0	14	1	73	0	0	13	150	0	0	163	0	0	478
3:00PM	0	0	0	0	0	0	0	0	41	18	0	59	0	0	12	0	2	0	14	6	0	4	42	0	0	46	0	0	119
3:15PM	0	0	0	0	0	0	0	0	54	16	0	70	0	0	14	0	3	0	17	0	0	5	34	0	0	39	0	0	126
3:30PM	0	0	0	0	0	0	0	0	51	18	0	69	0	0	18	0	2	0	20	0	0	4	41	0	0	45	0	0	134
3:45PM	0	0	0	0	0	0	0	0	49	17	0	66	0	0	9	0	0	0	9	0	0	7	67	0	0	74	0	0	149
Hourly Total	0	0	0	0	0	0	0	0	195	69	0	264	0	0	53	0	7	0	60	6	0	20	184	0	0	204	0	0	528
4:00PM	0	0	0	0	0	0	1	0	50	26	0	76	0	0	21	0	2	0	23	0	0	4	52	0	0	56	0	0	155
4:15PM	0	0	0	0	0	0	0	0	60	33	0	93	0	0	18	0	2	0	20	0	0	4	47	0	0	51	0	0	164
4:30PM	0	0	0	0	0	0	0	0	65	27	0	92	0	0	16	0	5	0	21	0	0	5	50	0	0	55	0	0	168
4:45PM	0	0	0	0	0	0	0	0	50	36	1	87	0	0	10	0	4	0	14	0	0	5	50	0	0	55	0	0	156
Hourly Total	0	0	0	0	0	0	1	0	225	122	1	348	0	0	65	0	13	0	78	0	0	18	199	0	0	217	0	0	643
5:00PM	0	0	0	0	0	0	0	0	68	39	0	107	0	0	15	0	4	0	19	0	0	9	67	0	0	76	0	0	202
5:15PM	0	0	0	0	0	0	0	0	65	42	0	107	0	0	15	0	5	0	20	0	0	5	53	0	0	58	0	0	185
5:30PM	0	0	0	0	0	0	2	0	66	38	0	104	0	0	15	0	2	0	17	0	0	5	42	0	0	47	0	0	168
5:45PM	0	0	0	0	0	0	0	0	43	26	1	70	0	0	26	0	2	0	28	1	0	8	36	0	0	44	0	0	142
Hourly Total	0	0	0	0	0	0	2	0	242	145	1	388	0	0	71	0	13	0	84	1	0	27	198	0	0	225	0	0	697
6:00PM	0	0	0	0	0	0	2	0	44	28	0	72	0	0	17	0	3	0	20	0	0	3	34	0	0	37	0	0	129
6:15PM	0	0	0	0	0	0	0	0	44	26	0	70	0	0	20	0	4	0	24	0	0	6	37	0	0	43	0	0	137
6:30PM	0	0	0	0	0	0	0	0	38	22	0	60	0	0	13	0	5	0	18	0	0	3	30	0	0	33	0	0	111
6:45PM	0	0	0	0	0	0	0	0	32	16	0	48	0	0	7	0	4	0	11	1	0	2	19	0	0	21	1	0	80
Hourly Total	0	0	0	0	0	0	2	0	158	92	0	250	0	0	57	0	16	0	73	1	0	14	120	0	0	134	1	0	457
7:00PM	0	0	0	0	0	0	0	1	25	28	0	54	0	0	9	0	0	0	9	0	0	3	17	0	0	20	0	0	83
7:15PM	0	0	0	0	0	0	0	0	22	20	0	42	0	0	7	0	1	0	8	0	0	3	15	0	0	18	0	0	68
7:30PM	0	0	0	0	0	0	0	0	26	16	0	42	0	0	4	0	1	0	5	0	0	2	13	0	0	15	0	0	62
7:45PM	0	0	0	0	0	0	0	0	28	22	1	51	0	0	6	0	4	0	10	0	0	2	13	0	0	15	0	0	76
Hourly Total	0	0	0	0	0	0	0	1	101	86	1	189	0	0	26	0	6	0	32	0	0	10	58	0	0	68	0	0	289
8:00PM	0	0	0	0	0	0	0	0	19	15	0	34	0	0	1	0	3	0	4	0	0	3	12	0	0	15	0	0	53
8:15PM	0	0	0	0	0	0	0	0	22	14	0	36	0	0	3	0	0	0	3	0	0	1	13	0	0	14	0	0	53
8:30PM	0	0	0	0	0	0	0	0	18	11	0	29	0	0	4	0	0	0	4	0	0	1	7	0	0	8	0	0	41
8:45PM	0	0	0	0	0	0	0	0	12	17	0	29	0	0	3	0	1	0	4	0	0	2	8	0	0	10	0	0	43
Hourly Total	0	0	0	0	0	0	0	0	71	57	0	128	0	0	11	0	4	0	15	0	0	7	40	0	0	47	0	0	190
9:00PM	0	0	0	0	0	0	0	0	7	13	0	20	0	0	2	0	1	0	3	1	0	1	4	0	0	5	0	0	28
9:15PM	0	0	0	0	0	0	0	0	17	7	0	24	0	0	3	0	0	0	3	1	0	1	6	0	0	7	0	0	34
9:30PM	0	0	0	0	0	0	0	0	7	12	0	19	0	0	7	0	1	0	8	0	0	1	5	0	0	6	0	0	33
9:45PM	0	0	0	0	0	0	0	0	7	12	0	19	0	0	4	0	0	0	4	0	0	1	7	0	0	8	0	0	31
Hourly Total	0	0	0	0	0	0	0	0	38	44	0	82	0	0	16	0	2	0	18	2	0	4	22	0	0	26	0	0	126
10:00PM	0	0	0	0	0	0	0	0	10	13	0	23	0	0	2	0	2	0	4	0	0	0	2	0	0	2	0	0	29
10:15PM	0	0	0	0	0	0	0	0	7	8	0	15	0	0	0	0	0	0	0										

Leg Direction	Neighborhood Entr / Ext Southbound						Oak Run Pkwy Westbound						Westpointe Dr Northbound						Oak Run Pkwy Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
% Bicycles on Road	0%	0%	0%	0%	-	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	-	13	-	-	-	-	-	0	-	-	-	-	-	20	-	-	-	-	-	10	-
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	0%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Oak Run @ Westpointe - TMC

Thu Jan 31, 2019

Full Length (12 AM-12 AM (+1))

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 616231, Location: 29.713044, -98.166212, Site Code: 1

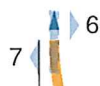


Provided by: C. J. Hensch & Associates Inc.

5215 Sycamore Ave.,
Pasadena, TX, 77503, US

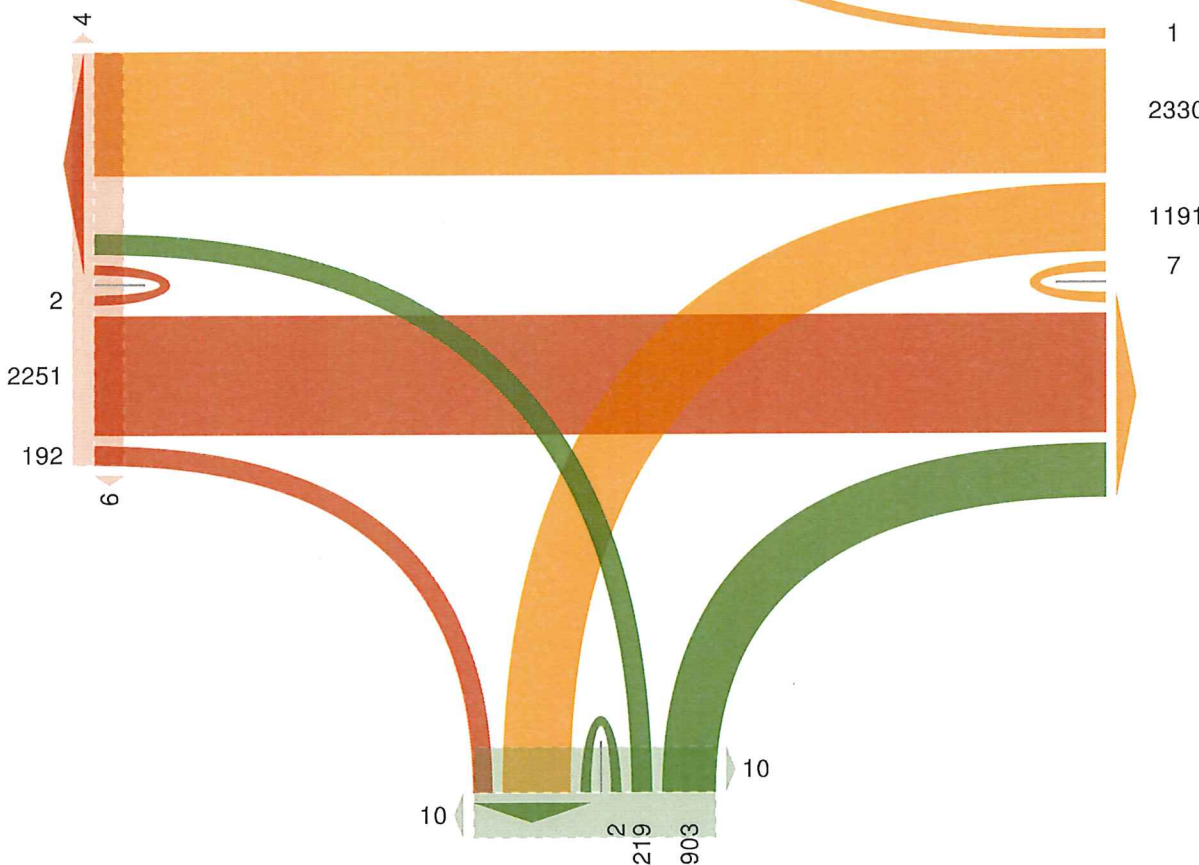
[N] Neighborhood Entr / Ext

Total: 1
In: 0 Out: 1



[W] Oak Run Pkwy

Total: 4996
In: 2445 Out: 2551



Total: 6690
In: 3529 Out: 3161

[E] Oak Run Pkwy

Out: 1385 In: 1124
Total: 2509

[S] Westpointe Dr

Oak Run @ Westpointe - TMC

Thu Jan 31, 2019

AM Peak (Jan 31 2019 7:15AM - 8:15 AM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 616231, Location: 29.713044, -98.166212, Site Code: 1



Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave.,
Pasadena, TX, 77503, US

Leg Direction	Neighborhood Entr / Ext Southbound						Oak Run Pkwy Westbound						Westpointe Dr Northbound						Oak Run Pkwy Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2019-01-31 7:15AM	0	0	0	0	0	0	0	45	4	0	49	0	21	0	12	0	33	0	2	52	0	0	54	0	136
7:30AM	0	0	0	0	0	0	0	55	11	0	66	0	23	0	3	0	26	0	5	60	0	0	65	0	157
7:45AM	0	0	0	0	0	0	0	80	10	0	90	0	27	0	4	0	31	0	0	66	0	0	66	0	187
8:00AM	0	0	0	0	0	0	0	59	14	0	73	0	16	0	5	0	21	0	2	64	0	0	66	0	160
Total	0	0	0	0	0	0	0	239	39	0	278	0	87	0	24	0	111	0	9	242	0	0	251	0	640
% Approach	0%	0%	0%	0%	-	-	0%	86.0%	14.0%	0%	-	-	78.4%	0%	21.6%	0%	-	-	3.6%	96.4%	0%	0%	-	-	-
% Total	0%	0%	0%	0%	0%	-	0%	37.3%	6.1%	0%	43.4%	-	13.6%	0%	3.8%	0%	17.3%	-	1.4%	37.8%	0%	0%	39.2%	-	-
PHF	-	-	-	-	-	-	-	0.747	0.696	-	0.772	-	0.806	-	0.500	-	0.841	-	0.450	0.917	-	-	0.951	-	0.856
Motorcycles	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0
% Motorcycles	0%	0%	0%	0%	-	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Lights	0	0	0	0	0	-	0	238	33	0	271	-	79	0	24	0	103	-	9	242	0	0	251	-	625
% Lights	0%	0%	0%	0%	-	-	0%	99.6%	84.6%	0%	97.5%	-	90.8%	0%	100%	0%	92.8%	-	100%	100%	0%	0%	100%	-	97.7%
Single-Unit Trucks	0	0	0	0	0	-	0	0	2	0	2	-	1	0	0	0	1	-	0	0	0	0	0	-	3
% Single-Unit Trucks	0%	0%	0%	0%	-	-	0%	0%	5.1%	0%	0.7%	-	1.1%	0%	0%	0%	0.9%	-	0%	0%	0%	0%	0%	-	0.5%
Articulated Trucks	0	0	0	0	0	-	0	0	4	0	4	-	7	0	0	0	7	-	0	0	0	0	0	-	11
% Articulated Trucks	0%	0%	0%	0%	-	-	0%	0%	10.3%	0%	1.4%	-	8.0%	0%	0%	0%	6.3%	-	0%	0%	0%	0%	0%	-	1.7%
Buses	0	0	0	0	0	-	0	1	0	0	1	-	0	0	0	0	0	-	0	0	0	0	0	-	1
% Buses	0%	0%	0%	0%	-	-	0%	0.4%	0%	0%	0.4%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0.2%
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	0%	-	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Oak Run @ Westpointe - TMC

Thu Jan 31, 2019

AM Peak (Jan 31 2019 7:15AM - 8:15 AM)

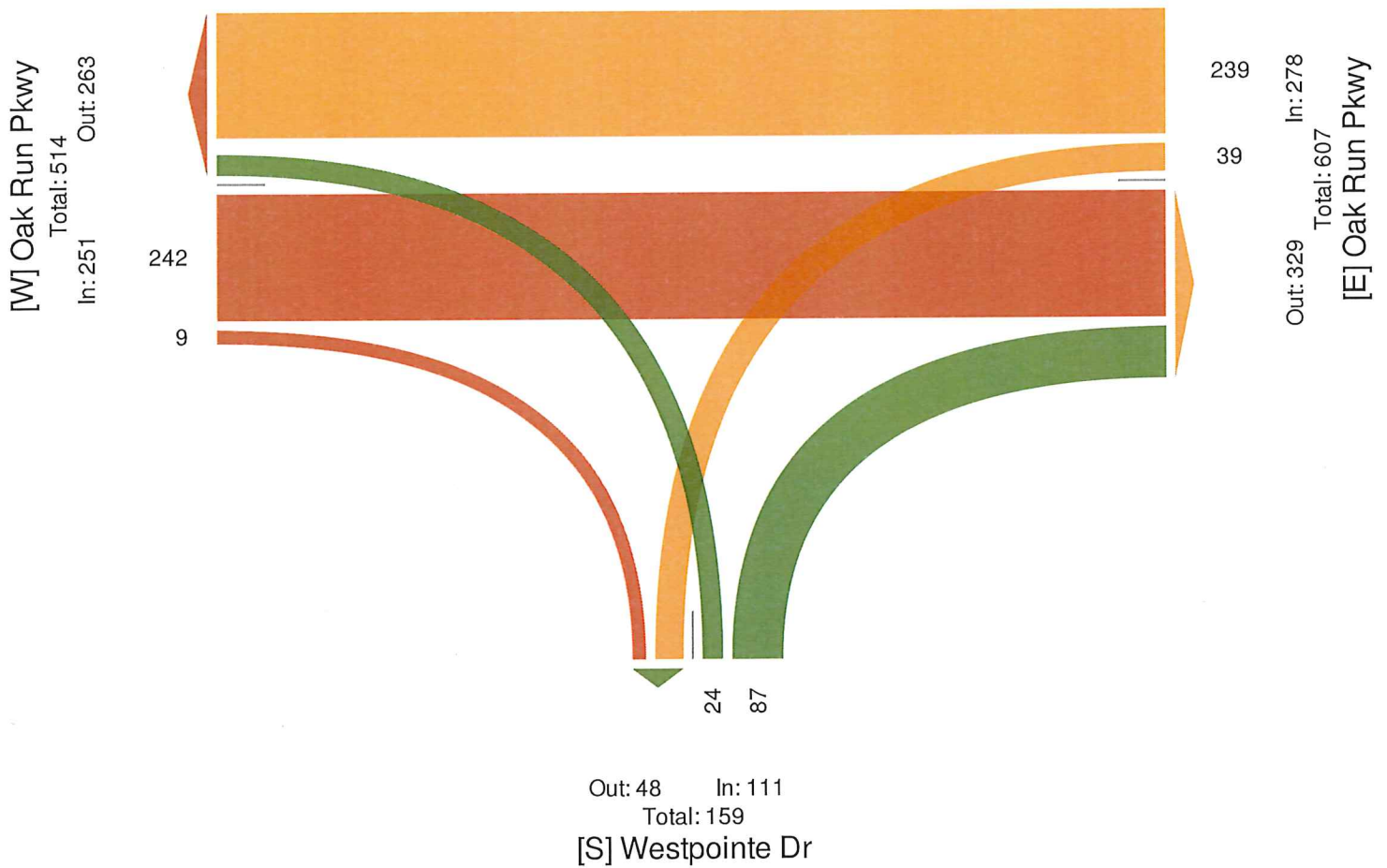
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 616231, Location: 29.713044, -98.166212, Site Code: 1

CJ Hensch &
Associates, Inc.

Provided by: C. J. Hensch &
Associates Inc.
5215 Sycamore Ave.,
Pasadena, TX, 77503, US



Oak Run @ Westpointe - TMC

Thu Jan 31, 2019

Midday Peak (Jan 31 2019 12PM - 1 PM)

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 616231, Location: 29.713044, -98.166212, Site Code: 1



Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave.,
Pasadena, TX, 77503, US

Leg Direction	Neighborhood Entr / Ext Southbound						Oak Run Pkwy Westbound						Westpointe Dr Northbound						Oak Run Pkwy Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2019-01-31 12:00PM	0	0	0	0	0	0	0	28	21	0	49	0	17	0	3	0	20	0	4	49	0	0	53	0	122
12:15PM	0	0	0	0	0	0	0	33	21	0	54	0	18	0	1	0	19	0	4	34	0	0	38	0	111
12:30PM	0	0	0	0	0	0	0	26	18	0	44	0	18	0	1	0	19	1	3	40	0	0	43	2	106
12:45PM	0	0	0	0	0	0	0	41	18	0	59	0	19	0	5	0	24	0	3	44	0	0	47	0	130
Total	0	0	0	0	0	0	0	128	78	0	206	0	72	0	10	0	82	1	14	167	0	0	181	2	469
% Approach	0%	0%	0%	0%	-	-	0%	62.1%	37.9%	0%	-	-	87.8%	0%	12.2%	0%	-	-	7.7%	92.3%	0%	0%	-	-	-
% Total	0%	0%	0%	0%	0%	-	0%	27.3%	16.6%	0%	43.9%	-	15.4%	0%	2.1%	0%	17.5%	-	3.0%	35.6%	0%	0%	38.6%	-	-
PHF	-	-	-	-	-	-	-	0.780	0.929	-	0.873	-	0.947	-	0.500	-	0.854	-	0.875	0.852	-	-	0.854	-	0.902
Motorcycles	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
% Motorcycles	0%	0%	0%	0%	-	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Lights	0	0	0	0	0	0	0	125	67	0	192	-	63	0	10	0	73	-	14	163	0	0	177	-	442
% Lights	0%	0%	0%	0%	-	-	0%	97.7%	85.9%	0%	93.2%	-	87.5%	0%	100%	0%	89.0%	-	100%	97.6%	0%	0%	97.8%	-	94.2%
Single-Unit Trucks	0	0	0	0	0	0	0	1	5	0	6	-	4	0	0	0	4	-	0	4	0	0	4	-	14
% Single-Unit Trucks	0%	0%	0%	0%	-	-	0%	0.8%	6.4%	0%	2.9%	-	5.6%	0%	0%	0%	4.9%	-	0%	2.4%	0%	0%	2.2%	-	3.0%
Articulated Trucks	0	0	0	0	0	0	0	2	6	0	8	-	5	0	0	0	5	-	0	0	0	0	0	-	13
% Articulated Trucks	0%	0%	0%	0%	-	-	0%	1.6%	7.7%	0%	3.9%	-	6.9%	0%	0%	0%	6.1%	-	0%	0%	0%	0%	0%	-	2.8%
Buses	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0
% Buses	0%	0%	0%	0%	-	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	0%	-	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-100%	-	-	-	-	-	-100%	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Oak Run @ Westpointe - TMC

Thu Jan 31, 2019

Midday Peak (Jan 31 2019 12PM - 1 PM)

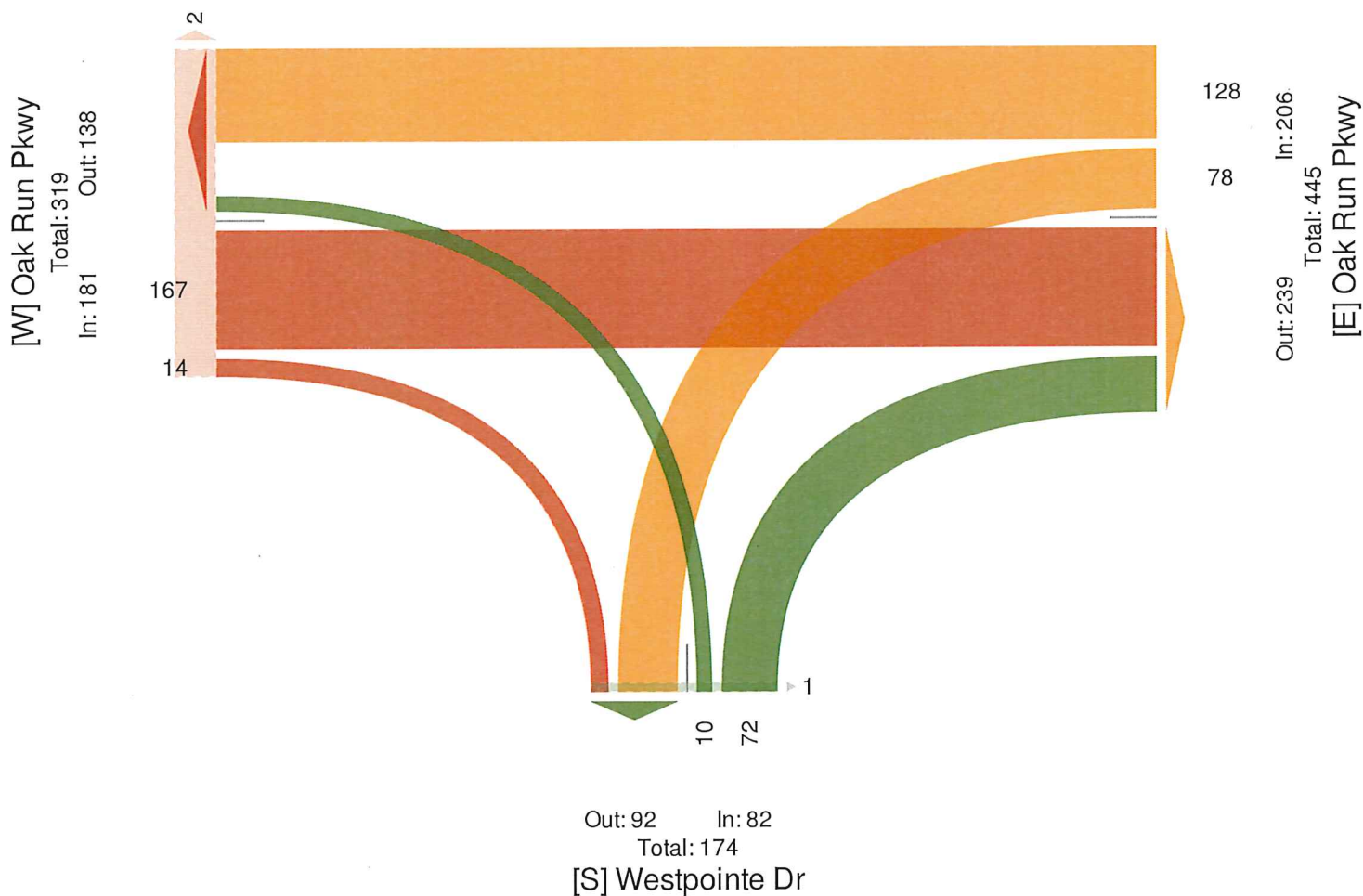
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 616231, Location: 29.713044, -98.166212, Site Code: 1



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5215 Sycamore Ave.,
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Oak Run @ Westpointe - TMC

Thu Jan 31, 2019

PM Peak (Jan 31 2019 4:30PM - 5:30 PM) - Overall Peak Hour

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 616231, Location: 29.713044, -98.166212, Site Code: 1



Provided by: C. J. Hensch & Associates Inc.
5215 Sycamore Ave.,
Pasadena, TX, 77503, US

Leg Direction	Neighborhood Entr / Ext Southbound						Oak Run Pkwy Westbound						Westpointe Dr Northbound						Oak Run Pkwy Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2019-01-31 4:30PM	0	0	0	0	0	0	0	65	27	0	92	0	16	0	5	0	21	0	5	50	0	0	55	0	168
4:45PM	0	0	0	0	0	0	0	50	36	1	87	0	10	0	4	0	14	0	5	50	0	0	55	0	156
5:00PM	0	0	0	0	0	0	0	68	39	0	107	0	15	0	4	0	19	0	9	67	0	0	76	0	202
5:15PM	0	0	0	0	0	0	0	65	42	0	107	0	15	0	5	0	20	0	5	53	0	0	58	0	185
Total	0	0	0	0	0	0	0	248	144	1	393	0	56	0	18	0	74	0	24	220	0	0	244	0	711
% Approach	0%	0%	0%	0%	-	-	0%	63.1%	36.6%	0.3%	-	-	75.7%	0%	24.3%	0%	-	-	9.8%	90.2%	0%	0%	-	-	-
% Total	0%	0%	0%	0%	0%	-	0%	34.9%	20.3%	0.1%	55.3%	-	7.9%	0%	2.5%	0%	10.4%	-	3.4%	30.9%	0%	0%	34.3%	-	-
PHF	-	-	-	-	-	-	-	0.912	0.857	0.250	0.918	-	0.875	-	0.900	-	0.881	-	0.667	0.821	-	-	0.803	-	0.880
Motorcycles	0	0	0	0	0	-	0	1	0	0	1	-	0	0	0	0	0	-	0	0	0	0	0	-	1
% Motorcycles	0%	0%	0%	0%	-	-	0%	0.4%	0%	0%	0.3%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0.1%
Lights	0	0	0	0	0	-	0	246	143	1	390	-	55	0	18	0	73	-	24	214	0	0	238	-	701
% Lights	0%	0%	0%	0%	-	-	0%	99.2%	99.3%	100%	99.2%	-	98.2%	0%	100%	0%	98.6%	-	100%	97.3%	0%	0%	97.5%	-	98.6%
Single-Unit Trucks	0	0	0	0	0	-	0	0	1	0	1	-	0	0	0	0	0	-	0	4	0	0	4	-	5
% Single-Unit Trucks	0%	0%	0%	0%	-	-	0%	0%	0.7%	0%	0.3%	-	0%	0%	0%	0%	0%	-	0%	1.8%	0%	0%	1.6%	-	0.7%
Articulated Trucks	0	0	0	0	0	-	0	0	0	0	0	-	1	0	0	0	1	-	0	1	0	0	1	-	2
% Articulated Trucks	0%	0%	0%	0%	-	-	0%	0%	0%	0%	0%	-	1.8%	0%	0%	0%	1.4%	-	0%	0.5%	0%	0%	0.4%	-	0.3%
Buses	0	0	0	0	0	-	0	1	0	0	1	-	0	0	0	0	0	-	0	1	0	0	1	-	2
% Buses	0%	0%	0%	0%	-	-	0%	0.4%	0%	0%	0.3%	-	0%	0%	0%	0%	0%	-	0%	0.5%	0%	0%	0.4%	-	0.3%
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	0%	-	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Oak Run @ Westpointe - TMC

Thu Jan 31, 2019

PM Peak (Jan 31 2019 4:30PM - 5:30 PM) - Overall Peak Hour

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 616231, Location: 29.713044, -98.166212, Site Code: 1

CJ Hensch &
Associates, Inc.

Provided by: C. J. Hensch &
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