

# FM 1097 at Buffalo Springs Drive

## *Traffic Signal Warrant Analysis*

*June 2021*



Prepared for:  
***City of Montgomery***

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Prepared by:



*Texas Board of Professional Engineers Registration No. F-439*  
6330 West Loop South, Suite 150 Bellaire, Texas 77401 (713) 777-5337

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# FM 1097 at Buffalo Springs Drive

## ***Traffic Signal Warrant Analysis*** ***June 2021***

Interim Review:

This Document is released for Review Only under the authority of Mary Beth Hairrell, P.E., Texas No. 140234 on June 30, 2021.

Prepared for:

***City of Montgomery***

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Prepared by:



Texas Board of Professional Engineers Registration No. F-439  
6330 West Loop South, Suite 150 Bellaire, Texas 77401 (713) 777-5337

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## Executive Summary

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City of Montgomery subcontracted Jones | Carter (JC) to prepare Traffic Signal Warrant Studies at FM 1097 at Buffalo Springs Drive. This study analyzes the intersection of FM 1097 at Buffalo Springs Drive and includes traffic data collection, site inspection, existing conditions, and applicable traffic signal warrants. The study intersection is located in the City of Montgomery, Texas.

A site inspection was conducted to document the existing conditions of the study intersection and surrounding area. The study intersection is two-way stop controlled; Buffalo Springs Drive/Summit Park Drive is stop controlled and FM 1097 is free flow. There is no illumination present at the study intersection. There are no pedestrian ramps or sidewalks at the study intersection.

A 13-hour Turning Movement Counts (TMC) were collected by CJ Hensch & Associates, Inc. on Tuesday, June 15, 2021 at the study intersection between the hours of 6:00 AM – 7:00 PM. The peak hours were reached between 8:00-9:00 AM and 4:30-5:30 PM.

The 2nd Revision (adopted 2014) to the 2011 Texas Manual on Uniform Traffic Control Devices (TMUTCD) defines warrants for the installation of a traffic signal. A Traffic Signal Warrant Analysis (TSWA) was performed at the intersection of FM 1097 at Buffalo Springs Drive for 2021 Existing Conditions. Warrant 1 – Eight Hour, Warrant 2 – Four Hour, Warrant 3 – Peak Hour and Warrant 7 – Crash Experience were evaluated. The study results in the following conclusions and recommendations:

### Conclusions and Recommendations

In accordance with the TMUTCD, Warrant 1- Eight-Hour Vehicular Volume, Warrant 2- Four-Hour Vehicular Volume, and Warrant 3 - Peak Hour were met using the data collected for the study intersection; therefore, a traffic signal is recommended.

It is recommended that the eastbound approach on FM 1097 be restriped to provide a left turn lane with the traffic signal installation.

The traffic volumes were collected in summer where counts tend to be lower when school is not in session. The existing traffic on the roadway met the need for a signal by meeting all three warrants. The traffic in the area is expected to grow as several planned developments in the area continue to develop in future years.

**Table of Contents**

Executive Summary..... i  
Introduction ..... 1  
Existing Conditions..... 2  
Traffic Data Collection..... 7  
Traffic Signal Warrant Analysis Results..... 8  
Conclusions and Recommendations..... 9

**List of Tables**

Table 1 – Traffic Volume Summary..... 7  
Table 2 – Summary of Traffic Signal Warrant Analysis ..... 8

**List of Figures**

Figure 1 – Intersection Aerial Photograph..... 1  
Figure 2 –FM 1097 at Buffalo Springs Drive Area Location Map ..... 2  
Figure 3 –FM 1097 at Buffalo Springs Drive Existing Conditions Diagram ..... 4  
Figure 4 – FM 1097 at Buffalo Springs Drive Eastbound Approach ..... 5  
Figure 5 – FM 1097 at Buffalo Springs Drive Westbound Approach ..... 5  
Figure 6 – FM 1097 at Buffalo Springs Drive Northbound Approach ..... 6  
Figure 7 – FM 1097 at Buffalo Springs Drive Southbound Approach ..... 6

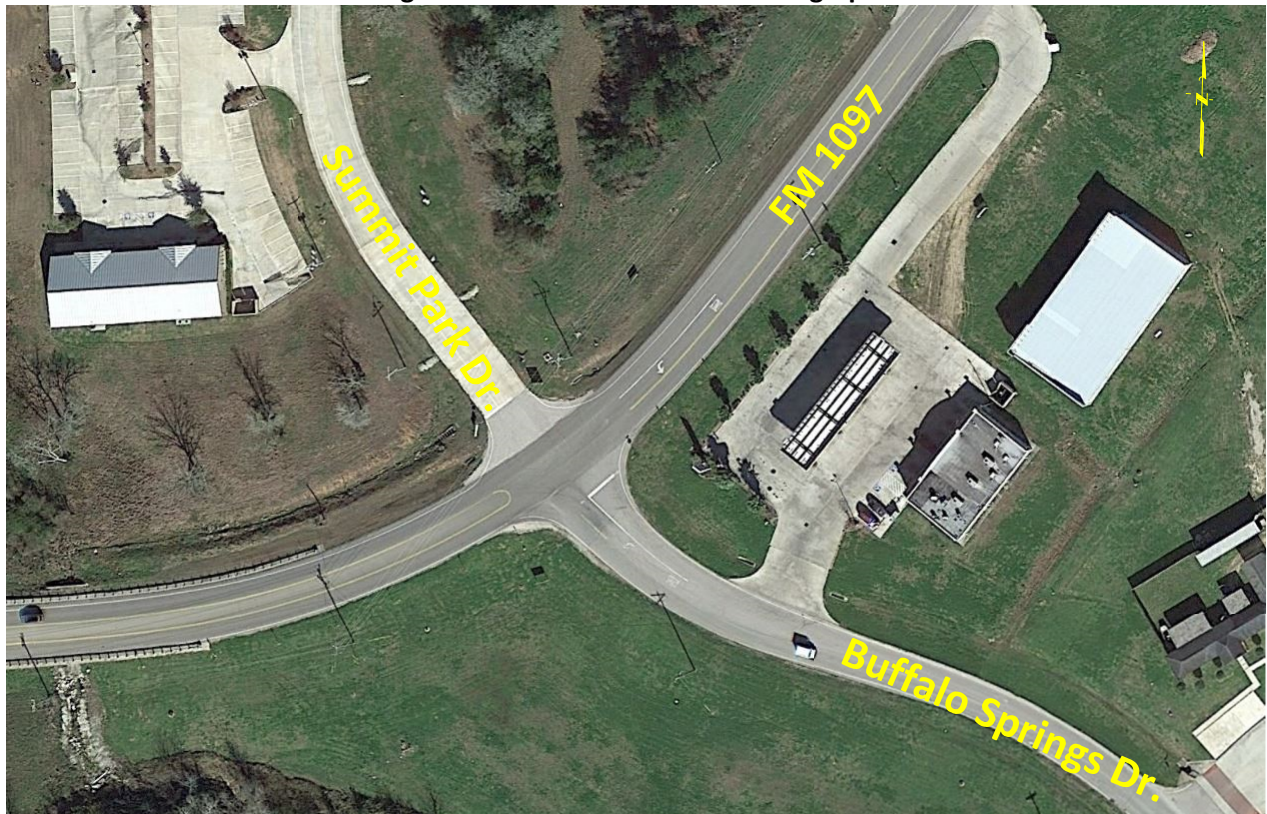
## Introduction

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The purpose of this Traffic Signal Warrant Analysis is to evaluate safety and operations at the intersection of FM 1097 and Buffalo Springs Drive in Montgomery County, Texas. The project is located in the City of Montgomery.

This study analyzes the intersection of FM 1097 at Buffalo Springs Drive and includes traffic data collection, site inspection, existing conditions, and applicable traffic signal warrants. An aerial photo of the study intersection is provided in **Figure 1**.

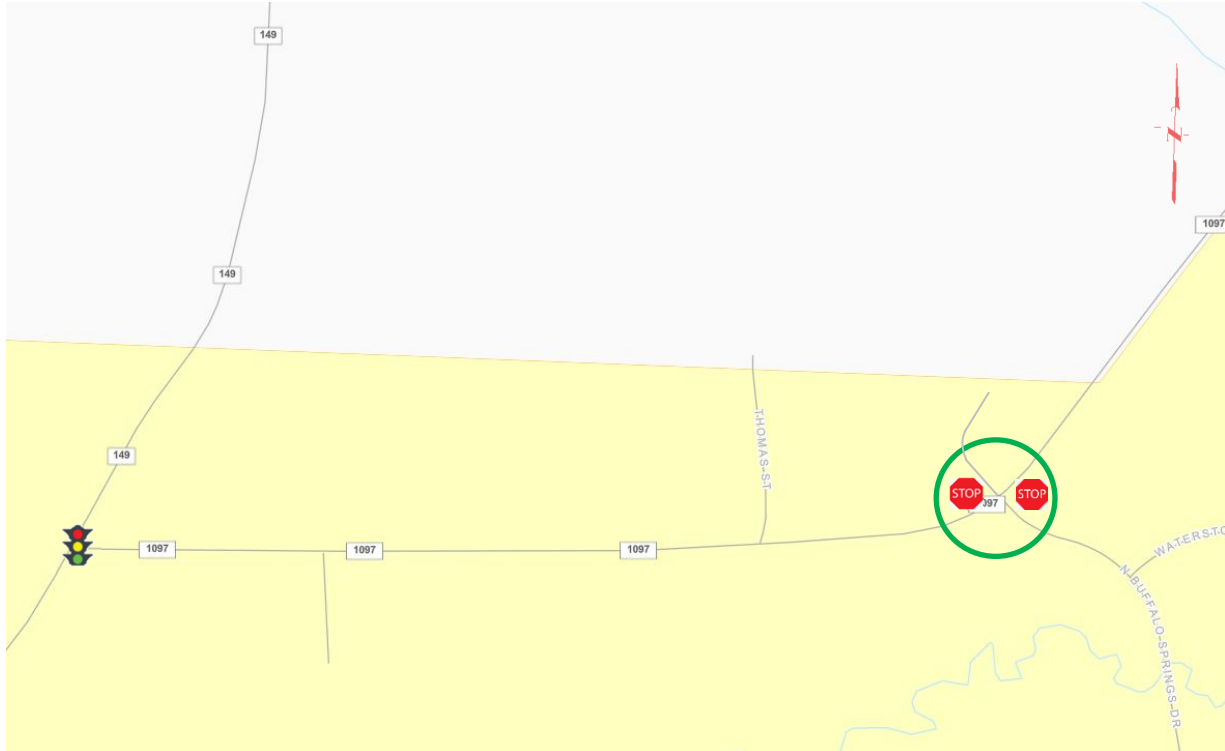
**Figure 1 – Intersection Aerial Photograph**



## Existing Conditions

The intersection is located in the City of Montgomery. FM 1097 at Buffalo Springs Drive is an existing two-way stop controlled intersection. The nearest signalized intersection is FM 1097 at FM 149 located approximately 0.6 miles to the west. The area location map is shown in **Figure 2**.

**Figure 2 –FM 1097 at Buffalo Springs Drive Area Location Map**



### Roadways

FM 1097 is a two-lane asphalt roadway that generally runs east-west. At the study intersection, there is 37 feet of pavement which includes two 10-foot wide travel lanes, a 10-foot wide left turn lane, a 5-foot shoulder on the north side and a 2-foot shoulder on the south side. It is a major thoroughfare with a posted speed limit of 55 mph and open ditch drainage.

Buffalo Springs Drive is a two-lane asphalt roadway that generally runs north-south. At the study intersection, there is 38 feet of pavement which includes two 12-foot wide travel lanes, a 12-foot wide left turn lane, and two 1-foot shoulders. It is assumed to be a local road with a posted speed limit of 30 mph and open ditch drainage.

Summit Park Drive is a two-lane concrete roadway that generally runs north-south. At the southbound approach to the study intersection, there is 38 feet of pavement which includes two 12-foot wide travel lanes, a 12-foot wide left turn lane, and two 1-foot shoulders. It is assumed to be a local road with a posted speed limit of 30 mph and open ditch drainage.

### Land Use

There are five companies located to the north of the intersection. The businesses include Montgomery Summit Business Park, CubeSmart Self Storage, Magnum Air Inc., Nazca Tech and Consulting, and Spring Fitness Montgomery.

The area to the south of the intersection, along Buffalo Springs Drive, is predominately residential. A gas station is located at the south-east corner of FM 1097 at Buffalo Springs Drive.

The area to the east, along FM 1097, is residential and is made up of vacant, wooded land.

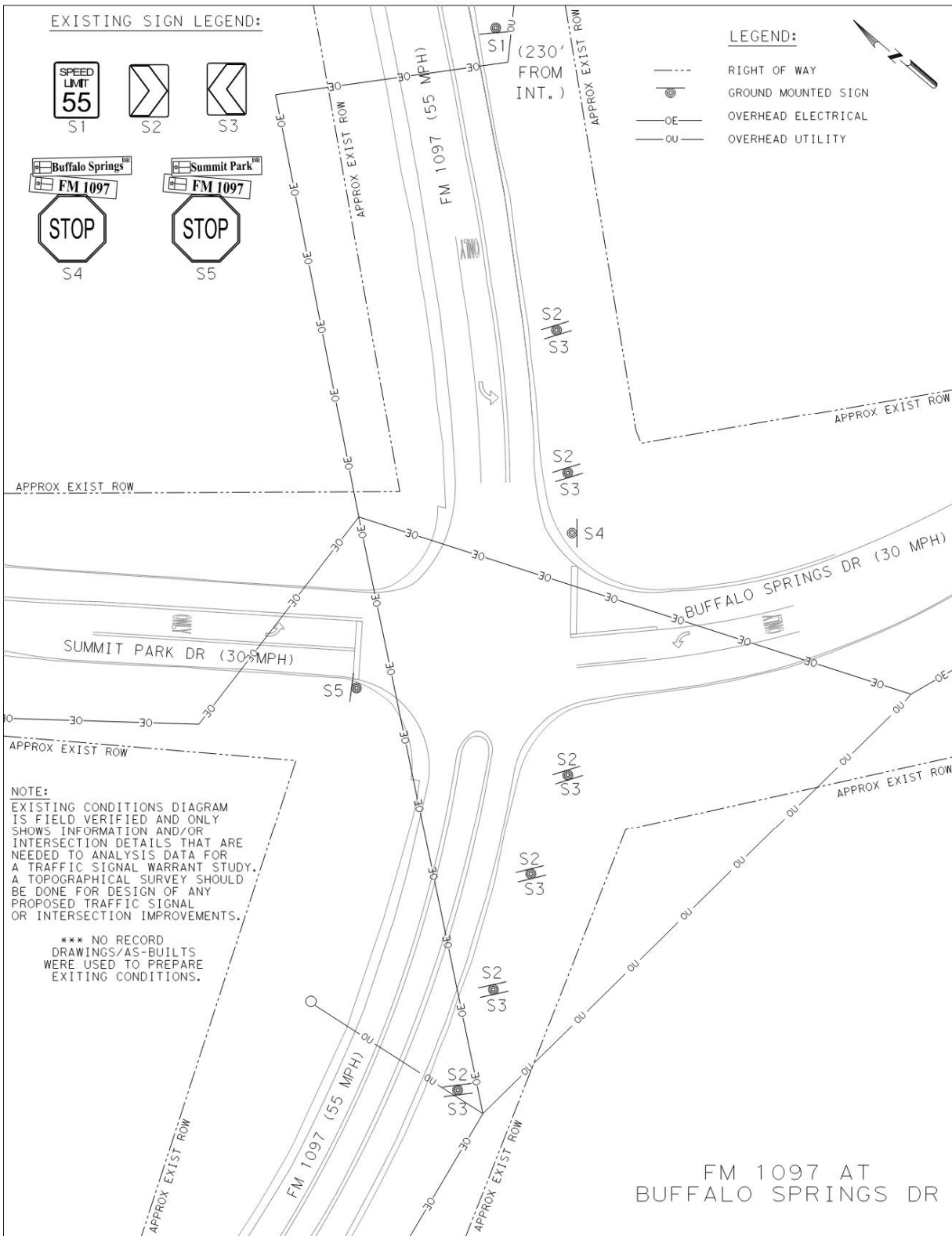
The area to the west is made up of vacant, wooded land.

### Intersection Conditions

A site inspection was conducted to document the existing conditions of the study intersection and surrounding area. The 4-leg study intersection is two-way stop controlled and there is no illumination at the intersection. There are no pedestrian ramps nor sidewalks at the study intersection.

An existing condition diagram is provided in **Figure 3**. Intersection approach photos are provided in **Figure 4** through **Figure 8**.

Figure 3 – FM 1097 at Buffalo Springs Drive Existing Conditions Diagram





**Figure 4 – FM 1097 at Buffalo Springs Drive Eastbound Approach**



**Figure 5 – FM 1097 at Buffalo Springs Drive Westbound Approach**



**Figure 6 – FM 1097 at Buffalo Springs Drive Northbound Approach**



**Figure 7 – FM 1097 at Buffalo Springs Drive Southbound Approach**



## Traffic Data Collection

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A 13-hour Turning Movement Count (TMC) was collected by CJ Hensch & Associates, Inc. on Wednesday, June 15, 2021 at the study intersection. The peak hours were reached between 8:00-9:00 AM and 4:30-5:30 PM.

A summary of the traffic data is provided in **Table 1** and the raw traffic count data can be found in the **Appendix**.

**Table 1 – Traffic Volume Summary**

Time Period	Traffic Volumes (vph)					Total Volume	Rank
	Major Street			Minor Street			
	FM 1097			Buffalo Springs Dr			
	WB	EB	Both Approaches	High Vol. App.			
7:00-8:00 AM	429	167	596	117		713	8
8:00-9:00 AM	432	198	630	171		801	5
9:30-10:30 AM	376	166	542	201		743	7
10:45-11:45 AM	384	183	567	222		789	6
12:00-1:00 PM	409	188	597	282		879	4
3:00-4:00 PM	382	236	618	295		913	3
4:30-5:30 PM	460	277	737	298		1035	1
5:30-6:30 PM	430	227	657	283		940	2

## Traffic Signal Warrant Analysis Results

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A Traffic Signal Warrant Analysis (TSWA) was performed at the intersection of FM 1097 at Buffalo Springs Drive for the 2021 Existing Conditions. The TSWA was performed in accordance with the 2<sup>nd</sup> Revision (adopted 2014) to the 2011 TMUTCD utilizing the TxDOT Form TFF-TSCA. A summary of the results is shown in **Table 2** and the complete analysis can be found in the **Appendix**.

**Table 2 – Summary of Traffic Signal Warrant Analysis**

Traffic Signal Warrant	Warrant Met
Warrant 1, Eight-Hour Vehicular Volume	Met
Warrant 2, Four-Hour Vehicular Volume	Met
Warrant 3, Peak Hour	Met
Warrant 4, Pedestrian Volume	Not Applicable
Warrant 5, School Crossing	Not Applicable
Warrant 6, Coordinated Signal System	Not Applicable
Warrant 7, Crash Experience	Not Met
Warrant 8, Roadway Network	Not Applicable
Warrant 9, Intersection Near a Grade Crossing	Not Applicable

Crash records were downloaded through TxDOT’s Crash Records Information System (CRIS) for 2015 through 2020. There were 6 reported crashes at the intersection during the years analyzed.

When analyzing 2021 Existing Conditions, Warrant 1-Eight-Hour Vehicular Volume, Warrant 2- Four-Hour Vehicular Volume and Warrant 3 - Peak Hour were met for the intersection.

## Conclusions and Recommendations

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Jones Carter determined the following conclusions and recommendations for the intersection of FM 1097 at Buffalo Springs Drive based on the analysis of the traffic data collection, site inspection, existing conditions, crash data, and applicable traffic signal warrants:

### Conclusions and Recommendations

In accordance with the TMUTCD, Warrant 1-Eight-Hour Vehicular Volume, Warrant 2- Four-Hour Vehicular Volume and Warrant 3 - Peak Hour were met using the data collected for the study intersection; therefore, a traffic signal is recommended at the intersection of FM 1097 at Buffalo Springs Drive.

It is recommended that the eastbound approach on FM 1097 be restriped to provide a left turn lane with the traffic signal installation.

The traffic volumes were collected in summer where counts tend to be lower when school is not in session. The existing traffic on the roadway met the need for a signal by meeting all three warrants. The traffic in the area is expected to grow as several planned developments in the area continue to develop in future years.

# Appendix

## Contents

Appendix A Traffic Counts

Appendix B Crash Data

Appendix C Traffic Signal Warrant Analysis – 2021 Existing Conditions

# **Appendix A**

## **Traffic Counts**





Leg Direction	Buffalo Springs Dr Southbound					FM 1097 Westbound					Buffalo Springs Dr Northbound					FM 1097 Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
4:45PM	1	1	0	0	2	0	51	50	0	101	62	1	10	0	73	12	51	0	0	63	239
Hourly Total	3	2	0	0	5	1	185	225	0	411	243	3	28	0	274	30	219	3	0	252	942
5:00PM	3	0	0	0	3	0	68	63	0	131	70	0	5	0	75	9	53	0	0	62	271
5:15PM	2	0	0	0	2	1	59	63	0	123	67	1	5	0	73	4	76	1	0	81	279
5:30PM	1	0	1	0	2	0	67	60	0	127	68	0	7	0	75	7	35	1	0	43	247
5:45PM	1	0	0	0	1	0	49	52	0	101	52	0	11	0	63	6	43	0	0	49	214
Hourly Total	7	0	1	0	8	1	243	238	0	482	257	1	28	0	286	26	207	2	0	235	1011
6:00PM	1	0	0	0	1	0	49	61	0	110	59	1	7	0	67	3	62	0	0	65	243
6:15PM	1	1	0	0	2	0	41	51	0	92	67	1	10	0	78	5	64	1	0	70	242
6:30PM	0	1	0	0	1	0	26	28	0	54	62	0	8	0	70	7	51	0	0	58	183
6:45PM	1	0	0	0	1	0	34	29	0	63	42	0	6	0	48	5	36	0	0	41	153
Hourly Total	3	2	0	0	5	0	150	169	0	319	230	2	31	0	263	20	213	1	0	234	821
<b>Total</b>	27	35	4	0	66	9	2427	2566	0	5002	2567	36	318	0	2921	319	2185	24	0	2528	10517
<b>% Approach</b>	40.9%	53.0%	6.1%	0%	-	0.2%	48.5%	51.3%	0%	-	87.9%	1.2%	10.9%	0%	-	12.6%	86.4%	0.9%	0%	-	-
<b>% Total</b>	0.3%	0.3%	0%	0%	0.6%	0.1%	23.1%	24.4%	0%	47.6%	24.4%	0.3%	3.0%	0%	27.8%	3.0%	20.8%	0.2%	0%	24.0%	-
<b>Lights</b>	26	33	3	0	62	8	2262	2483	0	4753	2469	35	307	0	2811	311	2038	23	0	2372	9998
<b>% Lights</b>	96.3%	94.3%	75.0%	0%	93.9%	88.9%	93.2%	96.8%	0%	95.0%	96.2%	97.2%	96.5%	0%	96.2%	97.5%	93.3%	95.8%	0%	93.8%	95.1%
<b>Single-Unit Trucks</b>	0	2	1	0	3	1	116	73	0	190	85	0	9	0	94	8	103	1	0	112	399
<b>% Single-Unit Trucks</b>	0%	5.7%	25.0%	0%	4.5%	11.1%	4.8%	2.8%	0%	3.8%	3.3%	0%	2.8%	0%	3.2%	2.5%	4.7%	4.2%	0%	4.4%	3.8%
<b>Articulated Trucks</b>	1	0	0	0	1	0	46	10	0	56	12	1	1	0	14	0	43	0	0	43	114
<b>% Articulated Trucks</b>	3.7%	0%	0%	0%	1.5%	0%	1.9%	0.4%	0%	1.1%	0.5%	2.8%	0.3%	0%	0.5%	0%	2.0%	0%	0%	1.7%	1.1%
<b>Buses</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>% Buses</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
<b>Bicycles on Road</b>	0	0	0	0	0	0	3	0	0	3	1	0	1	0	2	0	1	0	0	1	6
<b>% Bicycles on Road</b>	0%	0%	0%	0%	0%	0%	0.1%	0%	0%	0.1%	0%	0%	0.3%	0%	0.1%	0%	0%	0%	0%	0%	0.1%

\*L: Left, R: Right, T: Thru, U: U-Turn

**FM 1097 at Buffalo Springs Drive - TMC**

Tue Jun 15, 2021

Full Length (6 AM-7 PM)

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

All Movements

ID: 846402, Location: 30.404539, -95.688535

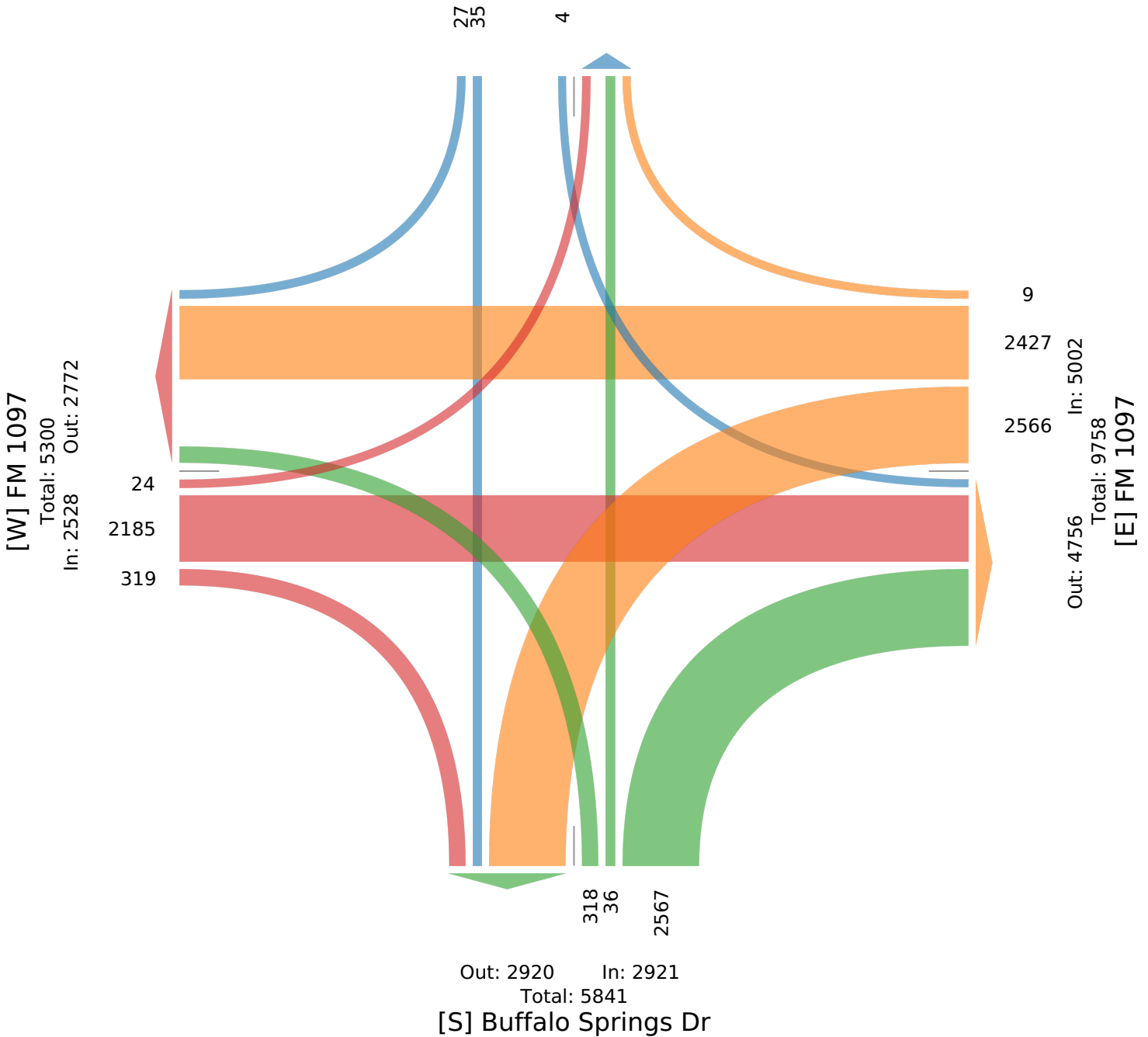


Provided by: C. J. Hensch & Associates Inc.  
5215 Sycamore Ave., Pasadena, TX, 77503, US

**[N] Buffalo Springs Dr**

Total: 135

In: 66 Out: 69



**FM 1097 at Buffalo Springs Drive - TMC**

Tue Jun 15, 2021

AM Peak (8 AM - 9 AM)

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

All Movements

ID: 846402, Location: 30.404539, -95.688535



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

Leg Direction	Buffalo Springs Dr Southbound					FM 1097 Westbound					Buffalo Springs Dr Northbound					FM 1097 Eastbound					Int
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2021-06-15 8:00AM	0	0	0	0	0	1	61	63	0	125	41	1	10	0	52	9	35	1	0	45	222
8:15AM	0	1	1	0	2	1	50	61	0	112	32	0	7	0	39	5	44	0	0	49	202
8:30AM	0	1	0	0	1	0	46	44	0	90	27	2	9	0	38	9	43	2	0	54	183
8:45AM	2	1	0	0	3	0	43	62	0	105	36	3	4	0	43	11	38	1	0	50	201
<b>Total</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>6</b>	<b>2</b>	<b>200</b>	<b>230</b>	<b>0</b>	<b>432</b>	<b>136</b>	<b>6</b>	<b>30</b>	<b>0</b>	<b>172</b>	<b>34</b>	<b>160</b>	<b>4</b>	<b>0</b>	<b>198</b>	<b>808</b>
<b>% Approach</b>	33.3%	50.0%	16.7%	0%	-	0.5%	46.3%	53.2%	0%	-	79.1%	3.5%	17.4%	0%	-	17.2%	80.8%	2.0%	0%	-	-
<b>% Total</b>	0.2%	0.4%	0.1%	0%	0.7%	0.2%	24.8%	28.5%	0%	53.5%	16.8%	0.7%	3.7%	0%	21.3%	4.2%	19.8%	0.5%	0%	24.5%	-
<b>PHF</b>	0.250	0.750	0.250	-	0.500	0.500	0.820	0.913	-	0.864	0.823	0.500	0.750	-	0.822	0.773	0.909	0.500	-	0.917	0.909
<b>Lights</b>	2	3	1	0	6	2	175	222	0	399	126	6	29	0	161	34	142	4	0	180	746
<b>% Lights</b>	100%	100%	100%	0%	100%	100%	87.5%	96.5%	0%	92.4%	92.6%	100%	96.7%	0%	93.6%	100%	88.8%	100%	0%	90.9%	92.3%
<b>Single-Unit Trucks</b>	0	0	0	0	0	0	14	8	0	22	7	0	1	0	8	0	11	0	0	11	41
<b>% Single-Unit Trucks</b>	0%	0%	0%	0%	0%	0%	7.0%	3.5%	0%	5.1%	5.1%	0%	3.3%	0%	4.7%	0%	6.9%	0%	0%	5.6%	5.1%
<b>Articulated Trucks</b>	0	0	0	0	0	0	11	0	0	11	2	0	0	0	2	0	7	0	0	7	20
<b>% Articulated Trucks</b>	0%	0%	0%	0%	0%	0%	5.5%	0%	0%	2.5%	1.5%	0%	0%	0%	1.2%	0%	4.4%	0%	0%	3.5%	2.5%
<b>Buses</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>% Buses</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
<b>Bicycles on Road</b>	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
<b>% Bicycles on Road</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.7%	0%	0%	0%	0.6%	0%	0%	0%	0%	0%	0.1%

\*L: Left, R: Right, T: Thru, U: U-Turn

**FM 1097 at Buffalo Springs Drive - TMC**

Tue Jun 15, 2021

AM Peak (8 AM - 9 AM)

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

All Movements

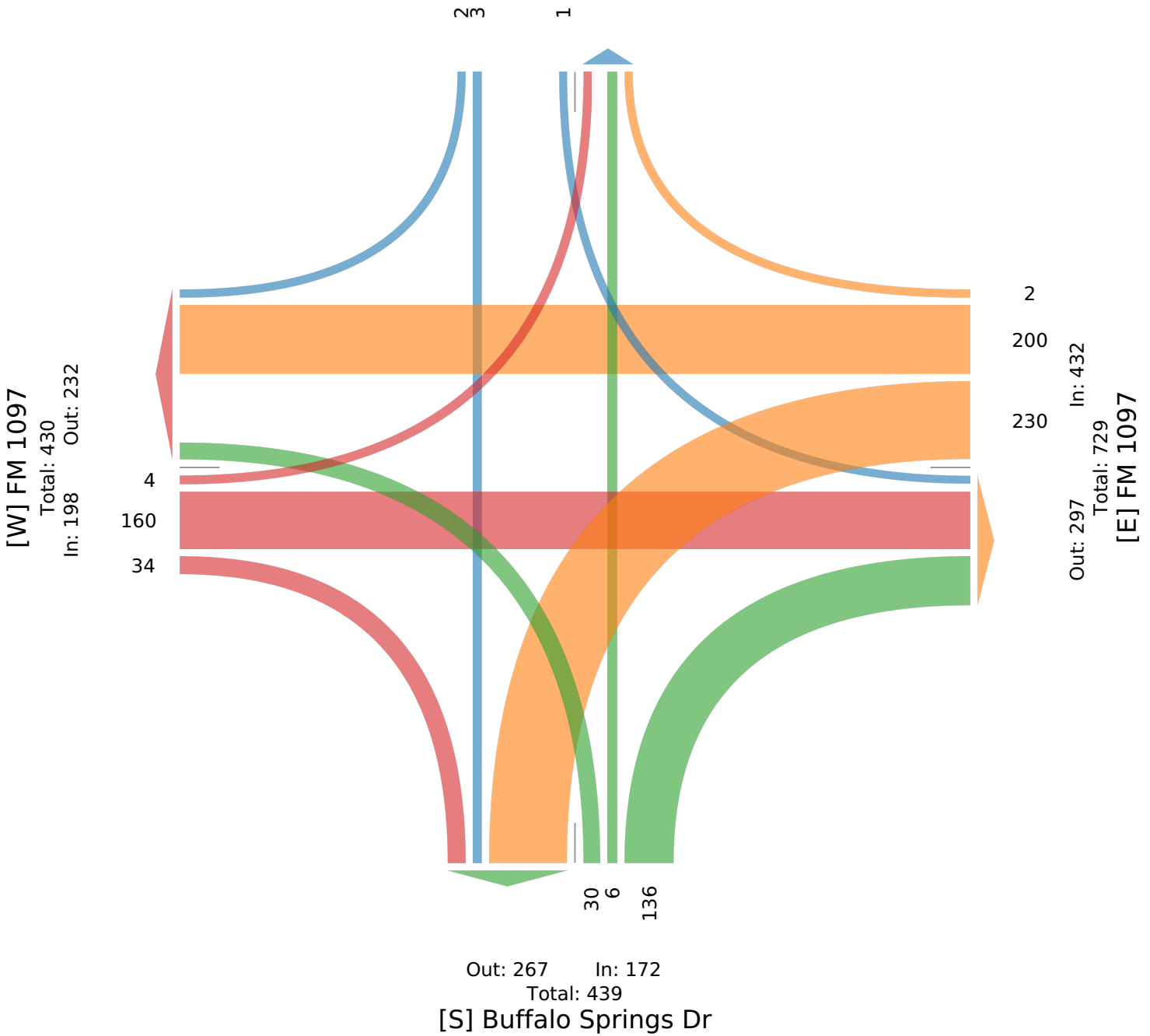
ID: 846402, Location: 30.404539, -95.688535



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

**[N] Buffalo Springs Dr**

Total: 18  
In: 6 Out: 12



**FM 1097 at Buffalo Springs Drive - TMC**

Tue Jun 15, 2021

Midday Peak (12 PM - 1 PM)

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

All Movements

ID: 846402, Location: 30.404539, -95.688535



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

Leg Direction	Buffalo Springs Dr Southbound					FM 1097 Westbound					Buffalo Springs Dr Northbound					FM 1097 Eastbound					Int
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2021-06-15 12:00PM	0	1	0	0	1	0	54	43	0	97	63	0	11	0	74	6	35	1	0	42	214
12:15PM	1	2	0	0	3	0	43	52	0	95	60	3	7	0	70	10	41	0	0	51	219
12:30PM	0	1	0	0	1	0	42	59	0	101	64	0	5	0	69	5	35	0	0	40	211
12:45PM	0	1	0	0	1	0	44	72	0	116	61	3	5	0	69	5	49	1	0	55	241
<b>Total</b>	1	5	0	0	6	0	183	226	0	409	248	6	28	0	282	26	160	2	0	188	885
<b>% Approach</b>	16.7%	83.3%	0%	0%	-	0%	44.7%	55.3%	0%	-	87.9%	2.1%	9.9%	0%	-	13.8%	85.1%	1.1%	0%	-	-
<b>% Total</b>	0.1%	0.6%	0%	0%	0.7%	0%	20.7%	25.5%	0%	46.2%	28.0%	0.7%	3.2%	0%	31.9%	2.9%	18.1%	0.2%	0%	21.2%	-
<b>PHF</b>	0.250	0.625	-	-	0.500	-	0.847	0.785	-	0.881	0.969	0.500	0.636	-	0.953	0.650	0.816	0.500	-	0.855	0.918
<b>Lights</b>	1	5	0	0	6	0	167	215	0	382	234	6	27	0	267	25	149	1	0	175	830
<b>% Lights</b>	100%	100%	0%	0%	100%	0%	91.3%	95.1%	0%	93.4%	94.4%	100%	96.4%	0%	94.7%	96.2%	93.1%	50.0%	0%	93.1%	93.8%
<b>Single-Unit Trucks</b>	0	0	0	0	0	0	12	9	0	21	13	0	1	0	14	1	9	1	0	11	46
<b>% Single-Unit Trucks</b>	0%	0%	0%	0%	0%	0%	6.6%	4.0%	0%	5.1%	5.2%	0%	3.6%	0%	5.0%	3.8%	5.6%	50.0%	0%	5.9%	5.2%
<b>Articulated Trucks</b>	0	0	0	0	0	0	4	2	0	6	1	0	0	0	1	0	2	0	0	2	9
<b>% Articulated Trucks</b>	0%	0%	0%	0%	0%	0%	2.2%	0.9%	0%	1.5%	0.4%	0%	0%	0%	0.4%	0%	1.3%	0%	0%	1.1%	1.0%
<b>Buses</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>% Buses</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
<b>Bicycles on Road</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>% Bicycles on Road</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

\*L: Left, R: Right, T: Thru, U: U-Turn

FM 1097 at Buffalo Springs Drive - TMC

Tue Jun 15, 2021

Midday Peak (12 PM - 1 PM)

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

All Movements

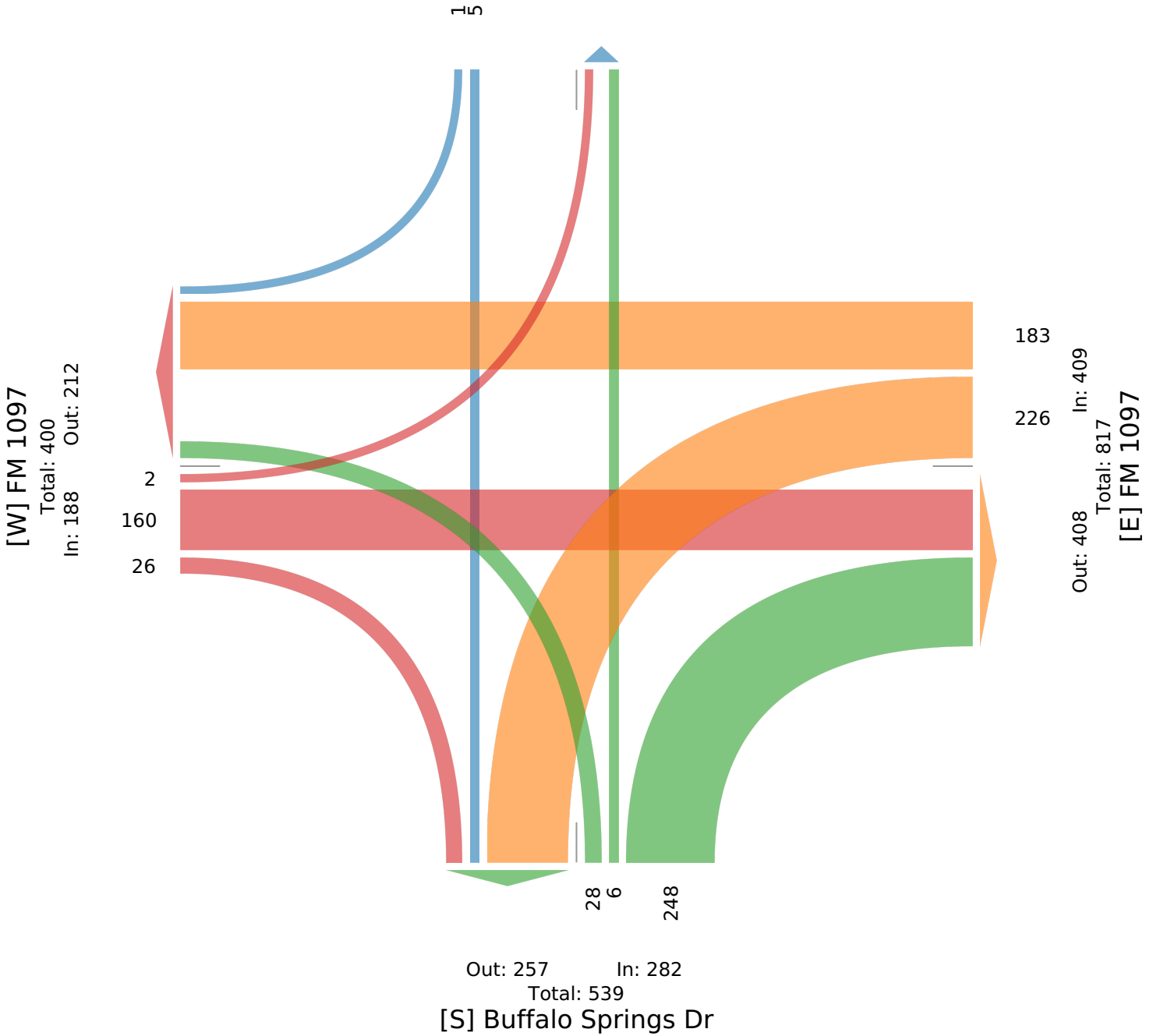
ID: 846402, Location: 30.404539, -95.688535



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

[N] Buffalo Springs Dr

Total: 14  
In: 6 Out: 8



**FM 1097 at Buffalo Springs Drive - TMC**

Tue Jun 15, 2021

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

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

All Movements

ID: 846402, Location: 30.404539, -95.688535



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

Leg Direction	Buffalo Springs Dr Southbound					FM 1097 Westbound					Buffalo Springs Dr Northbound					FM 1097 Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2021-06-15 4:30PM	1	1	0	0	2	0	49	56	0	105	67	1	9	0	77	7	62	2	0	71	255
4:45PM	1	1	0	0	2	0	51	50	0	101	62	1	10	0	73	12	51	0	0	63	239
5:00PM	3	0	0	0	3	0	68	63	0	131	70	0	5	0	75	9	53	0	0	62	271
5:15PM	2	0	0	0	2	1	59	63	0	123	67	1	5	0	73	4	76	1	0	81	279
<b>Total</b>	<b>7</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>1</b>	<b>227</b>	<b>232</b>	<b>0</b>	<b>460</b>	<b>266</b>	<b>3</b>	<b>29</b>	<b>0</b>	<b>298</b>	<b>32</b>	<b>242</b>	<b>3</b>	<b>0</b>	<b>277</b>	<b>1044</b>
<b>% Approach</b>	77.8%	22.2%	0%	0%	-	0.2%	49.3%	50.4%	0%	-	89.3%	1.0%	9.7%	0%	-	11.6%	87.4%	1.1%	0%	-	-
<b>% Total</b>	0.7%	0.2%	0%	0%	<b>0.9%</b>	0.1%	21.7%	22.2%	0%	<b>44.1%</b>	25.5%	0.3%	2.8%	0%	<b>28.5%</b>	3.1%	23.2%	0.3%	0%	<b>26.5%</b>	-
<b>PHF</b>	0.583	0.500	-	-	<b>0.750</b>	0.250	0.835	0.921	-	<b>0.878</b>	0.950	0.750	0.725	-	<b>0.968</b>	0.667	0.796	0.375	-	<b>0.855</b>	0.935
<b>Lights</b>	7	2	0	0	9	1	217	228	0	446	261	3	29	0	293	31	236	3	0	270	1018
<b>% Lights</b>	100%	100%	0%	0%	<b>100%</b>	100%	95.6%	98.3%	0%	<b>97.0%</b>	98.1%	100%	100%	0%	<b>98.3%</b>	96.9%	97.5%	100%	0%	<b>97.5%</b>	97.5%
<b>Single-Unit Trucks</b>	0	0	0	0	0	0	8	4	0	12	5	0	0	0	5	1	5	0	0	6	23
<b>% Single-Unit Trucks</b>	0%	0%	0%	0%	<b>0%</b>	0%	3.5%	1.7%	0%	<b>2.6%</b>	1.9%	0%	0%	0%	<b>1.7%</b>	3.1%	2.1%	0%	0%	<b>2.2%</b>	2.2%
<b>Articulated Trucks</b>	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
<b>% Articulated Trucks</b>	0%	0%	0%	0%	<b>0%</b>	0%	0.9%	0%	0%	<b>0.4%</b>	0%	0%	0%	0%	<b>0%</b>	0%	0.4%	0%	0%	<b>0.4%</b>	0.3%
<b>Buses</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>% Buses</b>	0%	0%	0%	0%	<b>0%</b>	0%	0%	0%	0%	<b>0%</b>	0%	0%	0%	0%	<b>0%</b>	0%	0%	0%	0%	<b>0%</b>	0%
<b>Bicycles on Road</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>% Bicycles on Road</b>	0%	0%	0%	0%	<b>0%</b>	0%	0%	0%	0%	<b>0%</b>	0%	0%	0%	0%	<b>0%</b>	0%	0%	0%	0%	<b>0%</b>	0%

\*L: Left, R: Right, T: Thru, U: U-Turn

**FM 1097 at Buffalo Springs Drive - TMC**

Tue Jun 15, 2021

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

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

All Movements

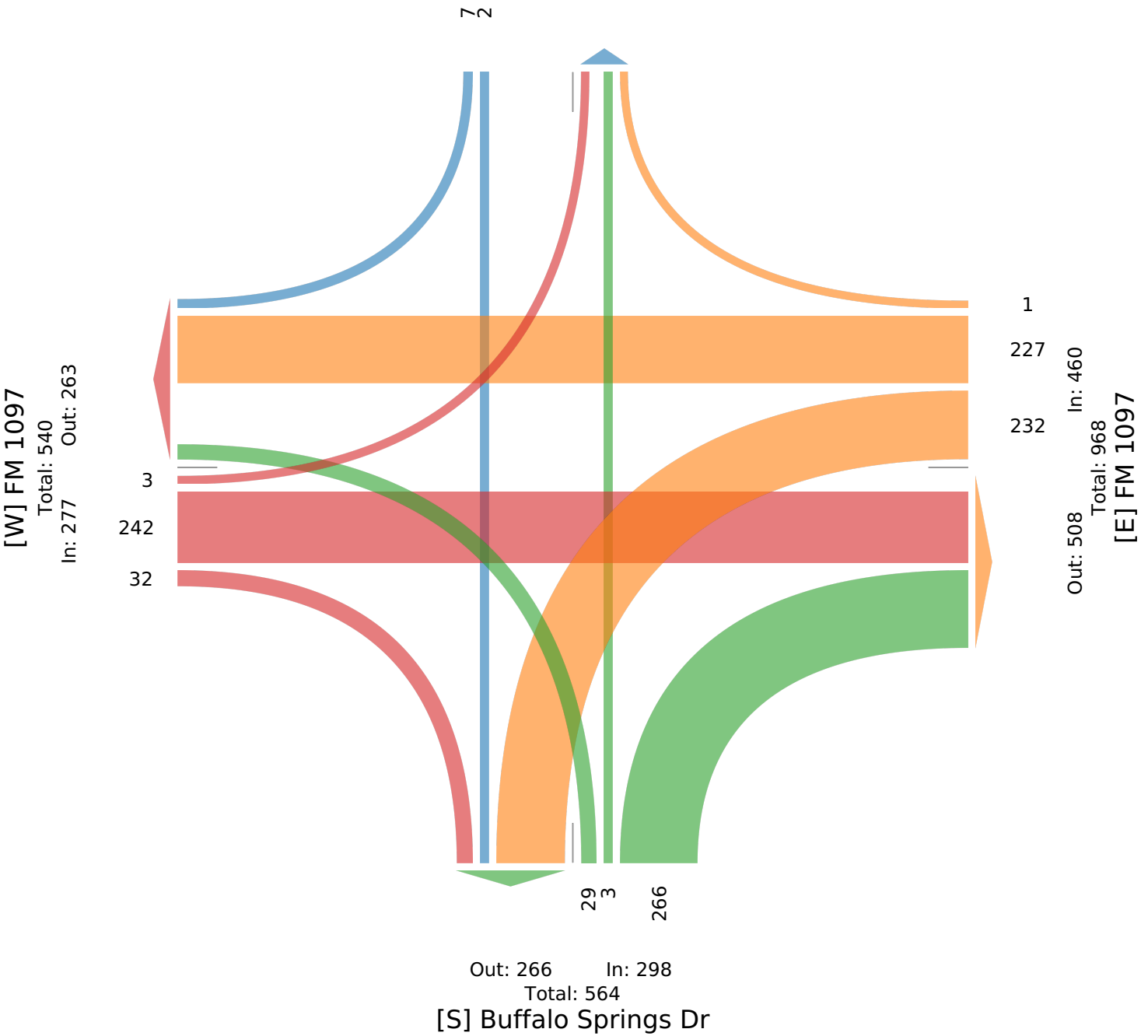
ID: 846402, Location: 30.404539, -95.688535



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

**[N] Buffalo Springs Dr**

Total: 16  
In: 9 Out: 7





## **Appendix B**

### **Crash Data**

All crash data available using this tool represents reportable data collected from Texas Peace Officer's Crash Reports (CR-3) received and processed by the Texas Department of Transportation (Department) as of 06/10/2021. The Department makes no warranty, representation or guaranty as to the content, accuracy, timeliness or completeness of any of the information provided as a result of your query. Any opinions and conclusions resulting from analysis performed on the crash data must be

Query Result Counts:

Your query returned a total of 6 Crashes containing 10 Units and 17 Person:

Filters Applied to current Query:

Crash Year Is In 2015 or 2016 or 2017 or 2018 or 2019 or 2020

Crash ID	Crash Severity	Crash Year	Highway Number	Highway System	Intersecting Street Name	Intersection Related	Latitude	Longitude	Street Name	Weather Condition
14458317	N - NOT INJURED	2015	1097	FARM TO MARKET	N/A	NON INTERSECTION	30.404474	-95.6887	FM1097	2 - CLOUDY
14867114	C - POSSIBLE INJURY	2016	1097	FARM TO MARKET	N/A	NON INTERSECTION	30.40440788	-95.6888	FM1097	1 - CLEAR
15212977	N - NOT INJURED	2016	1097	FARM TO MARKET	BUFFALO SPRINGS DR	INTERSECTION	30.40454889	-95.6886	FM1097	2 - CLOUDY
15272371	B - SUSPECTED MINOR INJURY	2016	1097	FARM TO MARKET	BUFFALO SPRINGS DR	INTERSECTION	30.40454889	-95.6886	FM1097	1 - CLEAR
17280051	N - NOT INJURED	2019	1097	FARM TO MARKET	BUFFALO SPRINGS DR	INTERSECTION RELATED	30.40454889	-95.6886	FM1097	2 - CLOUDY
17390181	N - NOT INJURED	2019	1097	FARM TO MARKET	BUFFALO SPRINGS DR	INTERSECTION	30.40454889	-95.6886	FM1097	1 - CLEAR

**Appendix C**  
**Traffic Signal Warrant Analysis – 2021 Existing**  
**Conditions**

# Warrants Summary Report

## 1: FM 1097 at Buffalo Springs Dr

### Intersection Information

	Major Street	Minor Street
Street Name	FM 1097	Summit Park Dr
Direction	EB/WB	NB/SB
Number of Lanes	2	2
Approach Speed	55	30

Warrant	Met?	Notes
<b>Warrant 1, Eight-Hour Vehicular Volume</b>		
	Yes	
Condition A or B Met?	Yes	11 Hours met (8 required)
Condition A and B Met?	Yes	12 Hours met (8 required)
<b>Warrant 2, Four-Hour Vehicular Volume</b>		
	Yes	10 Hours met (4 required)
<b>Warrant 3, Peak Hour</b>		
	Yes	
Condition A Met?	No	0 Hours met (1 required)
Condition B Met?	Yes	2 Hours met (1 required)
<b>Warrant 7, Crash Experience</b>		
	No	
Traffic Volume Conditio	Yes	12 Hours met (8 required)
Ped Condition?	No	0 Hours met (8 required)

# Warrant 1: Eight-hour Vehicular Volume

## 1: FM 1097 at Buffalo Springs Dr

### Intersection Information

Major Street Name: FM 1097  
 Major Street Direction: EB/WB  
 Minor Street Direction: NB/SB

**WARRANT 1 MET?** Yes

### Details:

Condition A Met? Yes 11 Hours met (8 required)  
 Condition B Met? Yes 12 Hours met (8 required)

Hour	Major Street Vehicles (Total of Both Approaches)	High Volume Minor Approach Vehicles	70% Standard Met? Cond. A OR Cond. B		56% Standard Met? Cond. A AND Cond. B	
			Condition A 70% Column	Condition B 70% Column	Condition A 56% Column	Condition B 56% Column
			<b>06:00 to 07:00</b>	<b>335</b>	<b>49</b>	No
Condition A	Volume >= 70% column (420)?	No	Volume >= 70% column (630)?	No		
	Volume >= 56% column (336)?	No	Volume >= 56% column (504)?	No		
Condition B	Volume >= 70% column (630)?	No	Volume >= 70% column (70)?	No		
	Volume >= 56% column (504)?	No	Volume >= 56% column (56)?	No		
<b>06:15 to 07:15</b>	<b>442</b>	<b>57</b>	No	No	No	No
Condition A	Volume >= 70% column (420)?	Yes	Volume >= 70% column (630)?	No		
	Volume >= 56% column (336)?	Yes	Volume >= 56% column (504)?	No		
Condition B	Volume >= 70% column (630)?	No	Volume >= 70% column (70)?	No		
	Volume >= 56% column (504)?	No	Volume >= 56% column (56)?	Yes		
<b>06:30 to 07:30</b>	<b>501</b>	<b>73</b>	No	No	No	No
Condition A	Volume >= 70% column (420)?	Yes	Volume >= 70% column (630)?	No		
	Volume >= 56% column (336)?	Yes	Volume >= 56% column (504)?	No		
Condition B	Volume >= 70% column (630)?	No	Volume >= 70% column (70)?	Yes		
	Volume >= 56% column (504)?	No	Volume >= 56% column (56)?	Yes		
<b>06:45 to 07:45</b>	<b>568</b>	<b>100</b>	No	No	No	Yes
Condition A	Volume >= 70% column (420)?	Yes	Volume >= 70% column (630)?	No		
	Volume >= 56% column (336)?	Yes	Volume >= 56% column (504)?	No		
Condition B	Volume >= 70% column (630)?	No	Volume >= 70% column (70)?	Yes		
	Volume >= 56% column (504)?	Yes	Volume >= 56% column (56)?	Yes		

<b>07:00 to 08:00</b>		<b>596</b>		<b>117</b>	<b>No</b>	<b>No</b>	<b>Yes*</b>	<b>Yes*</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>No</b>				
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>				
Condition B	Volume >= 70% column (630)?	<b>No</b>	Volume >= 70% column (70)?	<b>Yes</b>				
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>				

<b>07:15 to 08:15</b>		<b>620</b>		<b>151</b>	<b>Yes*</b>	<b>No</b>	<b>Yes</b>	<b>Yes</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>				
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>				
Condition B	Volume >= 70% column (630)?	<b>No</b>	Volume >= 70% column (70)?	<b>Yes</b>				
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>				

<b>07:30 to 08:30</b>		<b>637</b>		<b>159</b>	<b>Yes</b>	<b>Yes*</b>	<b>Yes</b>	<b>Yes</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>				
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>				
Condition B	Volume >= 70% column (630)?	<b>Yes</b>	Volume >= 70% column (70)?	<b>Yes</b>				
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>				

<b>07:45 to 08:45</b>		<b>622</b>		<b>162</b>	<b>Yes</b>	<b>No</b>	<b>Yes</b>	<b>Yes</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>				
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>				
Condition B	Volume >= 70% column (630)?	<b>No</b>	Volume >= 70% column (70)?	<b>Yes</b>				
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>				

<b>08:00 to 09:00</b>		<b>630</b>		<b>171</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes*</b>	<b>Yes*</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>				
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>				
Condition B	Volume >= 70% column (630)?	<b>Yes</b>	Volume >= 70% column (70)?	<b>Yes</b>				
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>				

<b>08:15 to 09:15</b>		<b>588</b>		<b>163</b>	<b>Yes*</b>	<b>No</b>	<b>Yes</b>	<b>Yes</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>				
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>				
Condition B	Volume >= 70% column (630)?	<b>No</b>	Volume >= 70% column (70)?	<b>Yes</b>				
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>				

<b>08:30 to 09:30</b>		<b>564</b>		<b>163</b>	<b>Yes</b>	<b>No</b>	<b>Yes</b>	<b>Yes</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>				
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>				
Condition B	Volume >= 70% column (630)?	<b>No</b>	Volume >= 70% column (70)?	<b>Yes</b>				
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>				

<b>08:45 to 09:45</b>		<b>574</b>		<b>170</b>	<b>Yes</b>	<b>No</b>	<b>Yes</b>	<b>Yes</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>				
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>				
Condition B	Volume >= 70% column (630)?	<b>No</b>	Volume >= 70% column (70)?	<b>Yes</b>				
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>				

<b>09:00 to 10:00</b>		<b>554</b>		<b>182</b>	<b>Yes</b>	<b>No</b>	<b>Yes*</b>	<b>Yes*</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>				
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>				
Condition B	Volume >= 70% column (630)?	<b>No</b>	Volume >= 70% column (70)?	<b>Yes</b>				
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>				

<b>09:15 to 10:15</b>		<b>547</b>		<b>185</b>	<b>Yes*</b>	<b>No</b>	<b>Yes</b>	<b>Yes</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>				
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>				
Condition B	Volume >= 70% column (630)?	<b>No</b>	Volume >= 70% column (70)?	<b>Yes</b>				
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>				

<b>09:30 to 10:30</b>		<b>542</b>		<b>201</b>	<b>Yes</b>	<b>No</b>	<b>Yes</b>	<b>Yes</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>				
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>				
Condition B	Volume >= 70% column (630)?	<b>No</b>	Volume >= 70% column (70)?	<b>Yes</b>				
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>				

<b>09:45 to 10:45</b>		<b>517</b>		<b>209</b>	<b>Yes</b>	<b>No</b>	<b>Yes</b>	<b>Yes</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>				
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>				
Condition B	Volume >= 70% column (630)?	<b>No</b>	Volume >= 70% column (70)?	<b>Yes</b>				
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>				

10:00 to 11:00		536	207	Yes	No	Yes*	Yes*
Condition A	Volume >= 70% column (420)?	Yes	Volume >= 70% column (630)?	Yes			
	Volume >= 56% column (336)?	Yes	Volume >= 56% column (504)?	Yes			
Condition B	Volume >= 70% column (630)?	No	Volume >= 70% column (70)?	Yes			
	Volume >= 56% column (504)?	Yes	Volume >= 56% column (56)?	Yes			

10:15 to 11:15		556	223	Yes*	No	Yes	Yes
Condition A	Volume >= 70% column (420)?	Yes	Volume >= 70% column (630)?	Yes			
	Volume >= 56% column (336)?	Yes	Volume >= 56% column (504)?	Yes			
Condition B	Volume >= 70% column (630)?	No	Volume >= 70% column (70)?	Yes			
	Volume >= 56% column (504)?	Yes	Volume >= 56% column (56)?	Yes			

10:30 to 11:30		549	212	Yes	No	Yes	Yes
Condition A	Volume >= 70% column (420)?	Yes	Volume >= 70% column (630)?	Yes			
	Volume >= 56% column (336)?	Yes	Volume >= 56% column (504)?	Yes			
Condition B	Volume >= 70% column (630)?	No	Volume >= 70% column (70)?	Yes			
	Volume >= 56% column (504)?	Yes	Volume >= 56% column (56)?	Yes			

10:45 to 11:45		567	222	Yes	No	Yes	Yes
Condition A	Volume >= 70% column (420)?	Yes	Volume >= 70% column (630)?	Yes			
	Volume >= 56% column (336)?	Yes	Volume >= 56% column (504)?	Yes			
Condition B	Volume >= 70% column (630)?	No	Volume >= 70% column (70)?	Yes			
	Volume >= 56% column (504)?	Yes	Volume >= 56% column (56)?	Yes			

11:00 to 12:00		581	225	Yes	No	Yes*	Yes*
Condition A	Volume >= 70% column (420)?	Yes	Volume >= 70% column (630)?	Yes			
	Volume >= 56% column (336)?	Yes	Volume >= 56% column (504)?	Yes			
Condition B	Volume >= 70% column (630)?	No	Volume >= 70% column (70)?	Yes			
	Volume >= 56% column (504)?	Yes	Volume >= 56% column (56)?	Yes			

11:15 to 12:15		579	236	Yes*	No	Yes	Yes
Condition A	Volume >= 70% column (420)?	Yes	Volume >= 70% column (630)?	Yes			
	Volume >= 56% column (336)?	Yes	Volume >= 56% column (504)?	Yes			
Condition B	Volume >= 70% column (630)?	No	Volume >= 70% column (70)?	Yes			
	Volume >= 56% column (504)?	Yes	Volume >= 56% column (56)?	Yes			



11:30 to 12:30		600	262		Yes	No	Yes	Yes
Condition A	Volume >= 70% column (420)?	Yes	Volume >= 70% column (630)?	Yes				
	Volume >= 56% column (336)?	Yes	Volume >= 56% column (504)?	Yes				
Condition B	Volume >= 70% column (630)?	No	Volume >= 70% column (70)?	Yes				
	Volume >= 56% column (504)?	Yes	Volume >= 56% column (56)?	Yes				

11:45 to 12:45		594	268		Yes	No	Yes	Yes
Condition A	Volume >= 70% column (420)?	Yes	Volume >= 70% column (630)?	Yes				
	Volume >= 56% column (336)?	Yes	Volume >= 56% column (504)?	Yes				
Condition B	Volume >= 70% column (630)?	No	Volume >= 70% column (70)?	Yes				
	Volume >= 56% column (504)?	Yes	Volume >= 56% column (56)?	Yes				

12:00 to 13:00		597	282		Yes	No	Yes*	Yes*
Condition A	Volume >= 70% column (420)?	Yes	Volume >= 70% column (630)?	Yes				
	Volume >= 56% column (336)?	Yes	Volume >= 56% column (504)?	Yes				
Condition B	Volume >= 70% column (630)?	No	Volume >= 70% column (70)?	Yes				
	Volume >= 56% column (504)?	Yes	Volume >= 56% column (56)?	Yes				

12:15 to 13:15		595	278		Yes*	No	Yes	Yes
Condition A	Volume >= 70% column (420)?	Yes	Volume >= 70% column (630)?	Yes				
	Volume >= 56% column (336)?	Yes	Volume >= 56% column (504)?	Yes				
Condition B	Volume >= 70% column (630)?	No	Volume >= 70% column (70)?	Yes				
	Volume >= 56% column (504)?	Yes	Volume >= 56% column (56)?	Yes				

12:30 to 13:30		601	279		Yes	No	Yes	Yes
Condition A	Volume >= 70% column (420)?	Yes	Volume >= 70% column (630)?	Yes				
	Volume >= 56% column (336)?	Yes	Volume >= 56% column (504)?	Yes				
Condition B	Volume >= 70% column (630)?	No	Volume >= 70% column (70)?	Yes				
	Volume >= 56% column (504)?	Yes	Volume >= 56% column (56)?	Yes				

12:45 to 13:45		597	284		Yes	No	Yes	Yes
Condition A	Volume >= 70% column (420)?	Yes	Volume >= 70% column (630)?	Yes				
	Volume >= 56% column (336)?	Yes	Volume >= 56% column (504)?	Yes				
Condition B	Volume >= 70% column (630)?	No	Volume >= 70% column (70)?	Yes				
	Volume >= 56% column (504)?	Yes	Volume >= 56% column (56)?	Yes				

<b>13:00 to 14:00</b>	<b>563</b>	<b>288</b>	<b>Yes</b>	<b>No</b>	<b>Yes*</b>	<b>Yes*</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>		
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>		
Condition B	Volume >= 70% column (630)?	<b>No</b>	Volume >= 70% column (70)?	<b>Yes</b>		
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>		

<b>13:15 to 14:15</b>	<b>568</b>	<b>291</b>	<b>Yes*</b>	<b>No</b>	<b>Yes</b>	<b>Yes</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>		
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>		
Condition B	Volume >= 70% column (630)?	<b>No</b>	Volume >= 70% column (70)?	<b>Yes</b>		
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>		

<b>13:30 to 14:30</b>	<b>568</b>	<b>303</b>	<b>Yes</b>	<b>No</b>	<b>Yes</b>	<b>Yes</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>		
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>		
Condition B	Volume >= 70% column (630)?	<b>No</b>	Volume >= 70% column (70)?	<b>Yes</b>		
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>		

<b>13:45 to 14:45</b>	<b>569</b>	<b>288</b>	<b>Yes</b>	<b>No</b>	<b>Yes</b>	<b>Yes</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>		
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>		
Condition B	Volume >= 70% column (630)?	<b>No</b>	Volume >= 70% column (70)?	<b>Yes</b>		
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>		

<b>14:00 to 15:00</b>	<b>583</b>	<b>280</b>	<b>Yes</b>	<b>No</b>	<b>Yes*</b>	<b>Yes*</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>		
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>		
Condition B	Volume >= 70% column (630)?	<b>No</b>	Volume >= 70% column (70)?	<b>Yes</b>		
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>		

<b>14:15 to 15:15</b>	<b>598</b>	<b>289</b>	<b>Yes*</b>	<b>No</b>	<b>Yes</b>	<b>Yes</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>		
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>		
Condition B	Volume >= 70% column (630)?	<b>No</b>	Volume >= 70% column (70)?	<b>Yes</b>		
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>		

<b>14:30 to 15:30</b>	<b>595</b>		<b>276</b>	<b>Yes</b>	<b>No</b>	<b>Yes</b>	<b>Yes</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>			
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>			
Condition B	Volume >= 70% column (630)?	<b>No</b>	Volume >= 70% column (70)?	<b>Yes</b>			
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>			

<b>14:45 to 15:45</b>	<b>616</b>		<b>277</b>	<b>Yes</b>	<b>No</b>	<b>Yes</b>	<b>Yes</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>			
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>			
Condition B	Volume >= 70% column (630)?	<b>No</b>	Volume >= 70% column (70)?	<b>Yes</b>			
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>			

<b>15:00 to 16:00</b>	<b>618</b>		<b>295</b>	<b>Yes</b>	<b>No</b>	<b>Yes*</b>	<b>Yes*</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>			
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>			
Condition B	Volume >= 70% column (630)?	<b>No</b>	Volume >= 70% column (70)?	<b>Yes</b>			
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>			

<b>15:15 to 16:15</b>	<b>605</b>		<b>285</b>	<b>Yes*</b>	<b>No</b>	<b>Yes</b>	<b>Yes</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>			
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>			
Condition B	Volume >= 70% column (630)?	<b>No</b>	Volume >= 70% column (70)?	<b>Yes</b>			
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>			

<b>15:30 to 16:30</b>	<b>635</b>		<b>267</b>	<b>Yes</b>	<b>Yes*</b>	<b>Yes</b>	<b>Yes</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>			
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>			
Condition B	Volume >= 70% column (630)?	<b>Yes</b>	Volume >= 70% column (70)?	<b>Yes</b>			
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>			

<b>15:45 to 16:45</b>	<b>652</b>		<b>284</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>			
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>			
Condition B	Volume >= 70% column (630)?	<b>Yes</b>	Volume >= 70% column (70)?	<b>Yes</b>			
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>			

<b>16:00 to 17:00</b>	<b>663</b>	<b>274</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes*</b>	<b>Yes*</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>		
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>		
Condition B	Volume >= 70% column (630)?	<b>Yes</b>	Volume >= 70% column (70)?	<b>Yes</b>		
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>		

<b>16:15 to 17:15</b>	<b>712</b>	<b>277</b>	<b>Yes*</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>		
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>		
Condition B	Volume >= 70% column (630)?	<b>Yes</b>	Volume >= 70% column (70)?	<b>Yes</b>		
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>		

<b>16:30 to 17:30</b>	<b>737</b>	<b>298</b>	<b>Yes</b>	<b>Yes*</b>	<b>Yes</b>	<b>Yes</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>		
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>		
Condition B	Volume >= 70% column (630)?	<b>Yes</b>	Volume >= 70% column (70)?	<b>Yes</b>		
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>		

<b>16:45 to 17:45</b>	<b>731</b>	<b>296</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>		
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>		
Condition B	Volume >= 70% column (630)?	<b>Yes</b>	Volume >= 70% column (70)?	<b>Yes</b>		
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>		

<b>17:00 to 18:00</b>	<b>717</b>	<b>286</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes*</b>	<b>Yes*</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>		
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>		
Condition B	Volume >= 70% column (630)?	<b>Yes</b>	Volume >= 70% column (70)?	<b>Yes</b>		
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>		

<b>17:15 to 18:15</b>	<b>699</b>	<b>278</b>	<b>Yes*</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>		
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>		
Condition B	Volume >= 70% column (630)?	<b>Yes</b>	Volume >= 70% column (70)?	<b>Yes</b>		
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>		

<b>17:30 to 18:30</b>	<b>657</b>		<b>283</b>	<b>Yes</b>	<b>Yes*</b>	<b>Yes</b>	<b>Yes</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>			
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>			
Condition B	Volume >= 70% column (630)?	<b>Yes</b>	Volume >= 70% column (70)?	<b>Yes</b>			
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>			

<b>17:45 to 18:45</b>	<b>599</b>		<b>278</b>	<b>Yes</b>	<b>No</b>	<b>Yes</b>	<b>Yes</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>			
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>			
Condition B	Volume >= 70% column (630)?	<b>No</b>	Volume >= 70% column (70)?	<b>Yes</b>			
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>			

<b>18:00 to 19:00</b>	<b>553</b>		<b>263</b>	<b>Yes</b>	<b>No</b>	<b>Yes*</b>	<b>Yes*</b>
Condition A	Volume >= 70% column (420)?	<b>Yes</b>	Volume >= 70% column (630)?	<b>Yes</b>			
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>			
Condition B	Volume >= 70% column (630)?	<b>No</b>	Volume >= 70% column (70)?	<b>Yes</b>			
	Volume >= 56% column (504)?	<b>Yes</b>	Volume >= 56% column (56)?	<b>Yes</b>			

<b>18:15 to 19:15</b>	<b>378</b>		<b>196</b>	<b>No</b>	<b>No</b>	<b>Yes</b>	<b>No</b>
Condition A	Volume >= 70% column (420)?	<b>No</b>	Volume >= 70% column (630)?	<b>Yes</b>			
	Volume >= 56% column (336)?	<b>Yes</b>	Volume >= 56% column (504)?	<b>Yes</b>			
Condition B	Volume >= 70% column (630)?	<b>No</b>	Volume >= 70% column (70)?	<b>Yes</b>			
	Volume >= 56% column (504)?	<b>No</b>	Volume >= 56% column (56)?	<b>Yes</b>			

<b>18:30 to 19:30</b>	<b>216</b>		<b>118</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>
Condition A	Volume >= 70% column (420)?	<b>No</b>	Volume >= 70% column (630)?	<b>No</b>			
	Volume >= 56% column (336)?	<b>No</b>	Volume >= 56% column (504)?	<b>Yes</b>			
Condition B	Volume >= 70% column (630)?	<b>No</b>	Volume >= 70% column (70)?	<b>Yes</b>			
	Volume >= 56% column (504)?	<b>No</b>	Volume >= 56% column (56)?	<b>Yes</b>			

<b>18:45 to 19:45</b>	<b>104</b>		<b>48</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>
Condition A	Volume >= 70% column (420)?	<b>No</b>	Volume >= 70% column (630)?	<b>No</b>			
	Volume >= 56% column (336)?	<b>No</b>	Volume >= 56% column (504)?	<b>No</b>			
Condition B	Volume >= 70% column (630)?	<b>No</b>	Volume >= 70% column (70)?	<b>No</b>			
	Volume >= 56% column (504)?	<b>No</b>	Volume >= 56% column (56)?	<b>No</b>			

## Warrant 2: Four-hour Vehicular Volume

### 1: FM 1097 at Buffalo Springs Dr

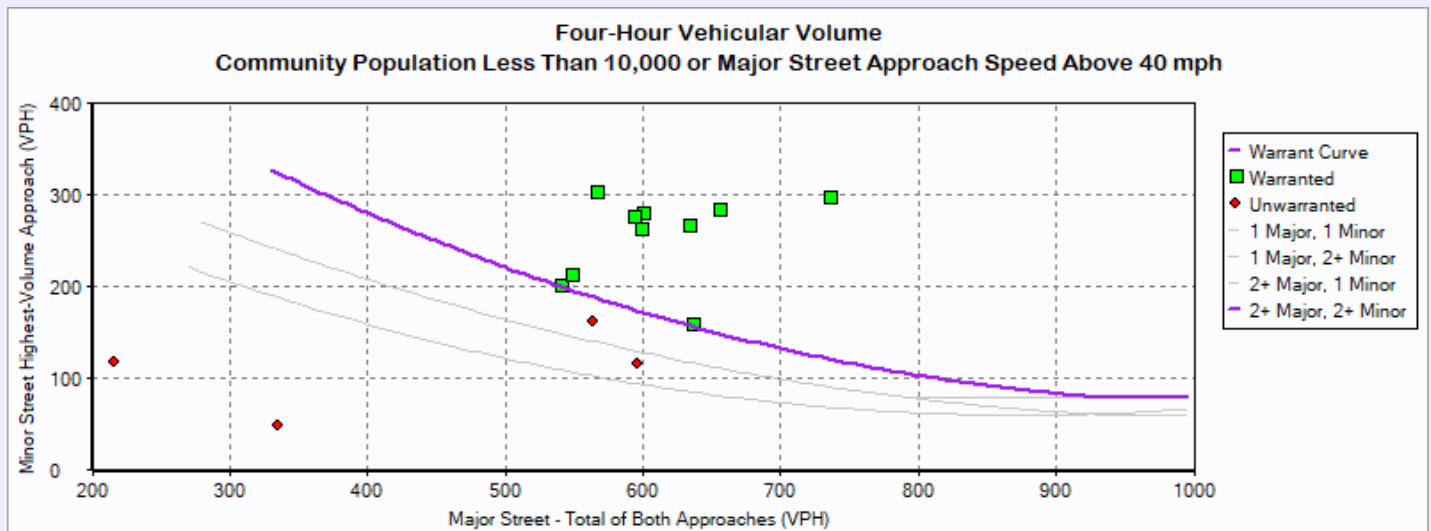
#### Intersection Information

	Major Street	Minor Street
Street Name	FM 1097	Summit Park Dr
Direction	EB/WB	NB/SB
Number of Lanes	2	2
Approach Speed	55	30

Warrant 2 Met? **Yes**

#### Details:

Notes	10 Hours met (4 required)
Low population	No



**Hourly Volumes**

<b>Hour</b>	<b>Major Street Total All Approaches (vph)</b>	<b>Minor Street Highest Volume Approach (vph)</b>
00:00:00 - 01:00:00	0.00	0.00
01:00:00 - 02:00:00	0.00	0.00
02:00:00 - 03:00:00	0.00	0.00
03:00:00 - 04:00:00	0.00	0.00
04:00:00 - 05:00:00	0.00	0.00
05:00:00 - 06:00:00	0.00	0.00
06:00:00 - 07:00:00	335.00	49.00
07:00:00 - 08:00:00	596.00	117.00
08:00:00 - 09:00:00	630.00	171.00
09:00:00 - 10:00:00	554.00	182.00
10:00:00 - 11:00:00	536.00	207.00
11:00:00 - 12:00:00	581.00	225.00
12:00:00 - 13:00:00	597.00	282.00
13:00:00 - 14:00:00	563.00	288.00
14:00:00 - 15:00:00	583.00	280.00
15:00:00 - 16:00:00	618.00	295.00
16:00:00 - 17:00:00	663.00	274.00
17:00:00 - 18:00:00	717.00	286.00
18:00:00 - 19:00:00	553.00	263.00
19:00:00 - 20:00:00	0.00	0.00
20:00:00 - 21:00:00	0.00	0.00
21:00:00 - 22:00:00	0.00	0.00
22:00:00 - 23:00:00	0.00	0.00
23:00:00 - 00:00:00	0.00	0.00

### Warranted Volumes

<b>Hour</b>	<b>Major Street Total All Approaches (vph)</b>	<b>Minor Street Highest Volume Approach (vph)</b>
07:30:00 - 08:30:00	637.00	159.00
09:30:00 - 10:30:00	542.00	201.00
10:30:00 - 11:30:00	549.00	212.00
11:30:00 - 12:30:00	600.00	262.00
12:30:00 - 13:30:00	601.00	279.00
13:30:00 - 14:30:00	568.00	303.00
14:30:00 - 15:30:00	595.00	276.00
15:30:00 - 16:30:00	635.00	267.00
16:30:00 - 17:30:00	737.00	298.00
17:30:00 - 18:30:00	657.00	283.00



## Warrant 3: Peak Hour

### 1: FM 1097 at Buffalo Springs Dr

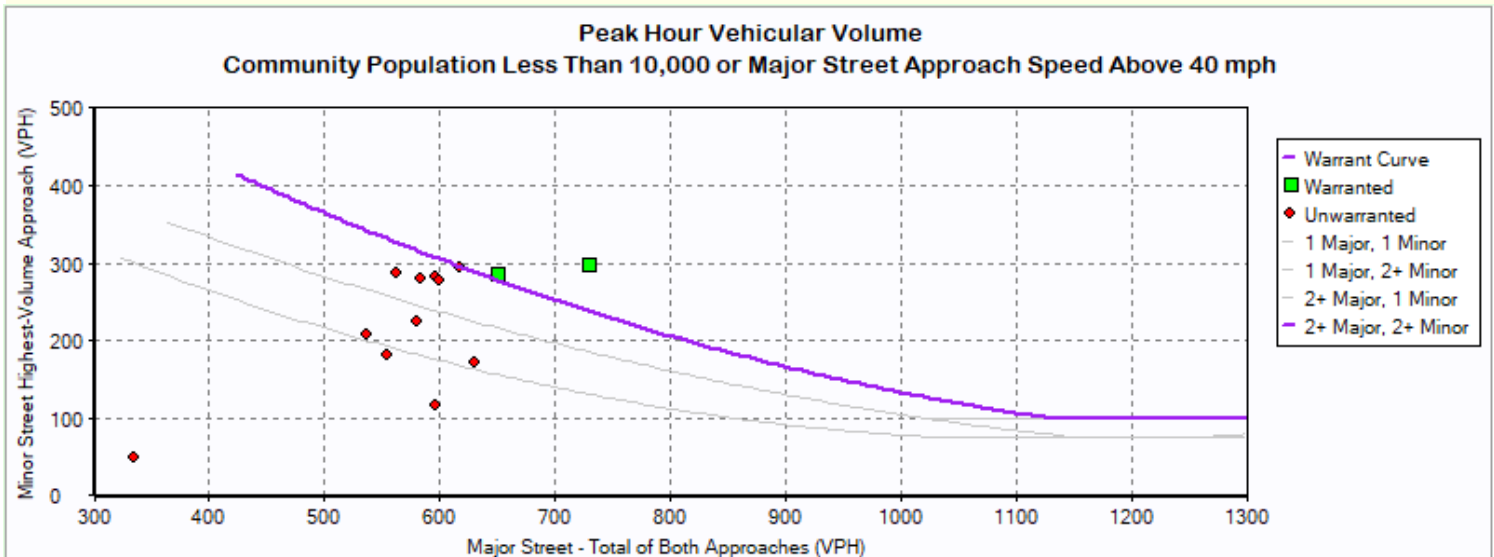
#### Intersection Information

	Major Street	Minor Street
Street Name	FM 1097	Summit Park Dr
Direction	EB/WB	NB/SB
Number of Lanes	2	2
Approach Speed	55	30

Warrant 3 Met? **Yes**

#### Details

Low Population?	<b>No</b>	Condition B Met?	<b>Yes</b>
Condition A Met?	<b>No</b>	Notes	2 Hours met (1 required)
Notes	0 Hours met (1 required)	Minor Approach Time Delay Condition Met?	<b>Not Met</b>
Minor Approach Time Delay Condition Met?	<b>Not Met</b>	Minor Approach Volume Condition Met?	<b>Met</b>
Minor Approach Volume Condition Met?	<b>Met</b>	Total Entering Intersection Volume Condition Met?	<b>Not Met</b>
Total Entering Intersection Volume Condition Met?	<b>Not Met</b>		



<b>Hour</b>	<b>Major Street</b> Total All Approaches (vph)	<b>Minor Street</b> Highest Volume Approach (vph)
6:00	335	49
7:00	596	117
8:00	630	171
9:00	554	182
10:00	536	207
11:00	581	225
12:00	597	282
13:00	563	288
14:00	583	280
15:00	618	295
15:45	652	284
16:45	731	296
17:45	599	278
18:45	104	48

## Warrant 7: Crash Experience

### 1: FM 1097 at Buffalo Springs Dr

#### Intersection Information

Major Street Name	FM 1097
Major Street Direction	EB/WB
Minor Street Direction	NB/SB

**WARRANT 7 MET?** No

#### Details:

Low Population?	<span style="background-color: red; color: white; padding: 2px;">No</span>	Traffic Volume Condition Met?	<span style="background-color: lightgreen; color: black; padding: 2px;">Yes</span>
Major Street Speed Limit	55		12 Hours Met (8 Required)
Major Street 85th-% tile Speed	0.00	Ped Volume Condition Met?	<span style="background-color: red; color: white; padding: 2px;">No</span>
			0 Hours Met (8 Required)
	Qualifying Crashes	<b>2</b>	
	Adequate Alternative Trials?	<span style="background-color: red; color: white; padding: 2px;">No</span>	

Hour	Traffic Volumes				Pedestrian Volumes			
	Major Street Vehicles	Minor Street Vehicles	80% Standard Met? A or B		Northbound Ped Volumes		Southbound Ped Volumes	
			Condition A	Condition B	Peds	> 80?	Peds	> 80?
06:00 to 07:00	335	0	No	No	0	<span style="background-color: red; color: white; padding: 2px;">No</span>	0	No
06:15 to 07:15	442	0	No	No	0	<span style="background-color: red; color: white; padding: 2px;">No</span>	0	No
06:30 to 07:30	501	0	No	No	0	<span style="background-color: red; color: white; padding: 2px;">No</span>	0	No
06:45 to 07:45	568	0	No	No	0	<span style="background-color: red; color: white; padding: 2px;">No</span>	0	No
07:00 to 08:00	596	0	No	No	0	<span style="background-color: red; color: white; padding: 2px;">No</span>	0	No
07:15 to 08:15	620	0	No	No	0	<span style="background-color: red; color: white; padding: 2px;">No</span>	0	No
07:30 to 08:30	637	0	No	No	0	<span style="background-color: red; color: white; padding: 2px;">No</span>	0	No

07:45 to 08:45	622	0	No	No	0	No	0	No
08:00 to 09:00	630	0	No	No	0	No	0	No
08:15 to 09:15	588	0	No	No	0	No	0	No
08:30 to 09:30	564	0	No	No	0	No	0	No
08:45 to 09:45	574	0	No	No	0	No	0	No
09:00 to 10:00	554	0	No	No	0	No	0	No
09:15 to 10:15	547	0	No	No	0	No	0	No
09:30 to 10:30	542	0	No	No	0	No	0	No
09:45 to 10:45	517	0	No	No	0	No	0	No
10:00 to 11:00	536	0	No	No	0	No	0	No
10:15 to 11:15	556	0	No	No	0	No	0	No
10:30 to 11:30	549	0	No	No	0	No	0	No
10:45 to 11:45	567	0	No	No	0	No	0	No
11:00 to 12:00	581	0	No	No	0	No	0	No
11:15 to 12:15	579	0	No	No	0	No	0	No
11:30 to 12:30	600	0	No	No	0	No	0	No
11:45 to 12:45	594	0	No	No	0	No	0	No

12:00 to 13:00	597	0	No	No	0	No	0	No
12:15 to 13:15	595	0	No	No	0	No	0	No
12:30 to 13:30	601	0	No	No	0	No	0	No
12:45 to 13:45	597	0	No	No	0	No	0	No
13:00 to 14:00	563	0	No	No	0	No	0	No
13:15 to 14:15	568	0	No	No	0	No	0	No
13:30 to 14:30	568	0	No	No	0	No	0	No
13:45 to 14:45	569	0	No	No	0	No	0	No
14:00 to 15:00	583	0	No	No	0	No	0	No
14:15 to 15:15	598	0	No	No	0	No	0	No
14:30 to 15:30	595	0	No	No	0	No	0	No
14:45 to 15:45	616	0	No	No	0	No	0	No
15:00 to 16:00	618	0	No	No	0	No	0	No
15:15 to 16:15	605	0	No	No	0	No	0	No
15:30 to 16:30	635	0	No	No	0	No	0	No
15:45 to 16:45	652	0	No	No	0	No	0	No
16:00 to 17:00	663	0	No	No	0	No	0	No

16:15 to 17:15	712	0	No	No	0	No	0	No
16:30 to 17:30	737	0	No	No	0	No	0	No
16:45 to 17:45	731	0	No	No	0	No	0	No
17:00 to 18:00	717	0	No	No	0	No	0	No
17:15 to 18:15	699	0	No	No	0	No	0	No
17:30 to 18:30	657	0	No	No	0	No	0	No
17:45 to 18:45	599	0	No	No	0	No	0	No
18:00 to 19:00	553	0	No	No	0	No	0	No
18:15 to 19:15	378	0	No	No	0	No	0	No
18:30 to 19:30	216	0	No	No	0	No	0	No
18:45 to 19:45	104	0	No	No	0	No	0	No