

Traffic Impact Analysis

Champions Tract 3

Austin, Texas

Prepared for:

**Champion Assets LTD, Champion Legacy, and
Champion Meier Assets LTD**

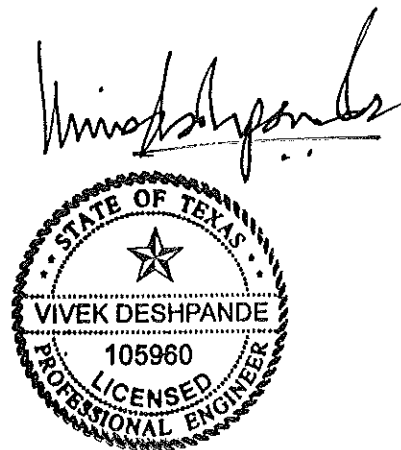
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Contents

EXECUTIVE SUMMARY	iii
INTRODUCTION	1
A. Purpose	1
B. Methodology	1
EXISTING AND FUTURE AREA CONDITIONS.....	3
A. Roadway Characteristics	3
B. Proposed Site development	3
C. Existing Traffic Volumes	3
PROJECT TRAFFIC CHARACTERISTICS.....	6
A. Site-Generated Traffic	6
B. Trip Distribution and Assignment	6
C. Development of 2016 Background Traffic	7
D. Development of 2016 Total Traffic	7
TRAFFIC OPERATIONS ANALYSIS	12
A. Analysis Methodology	12
B. Analysis Results	13
C. Mitigations and Improvements	13
D. Pro-Rata Share of Mitigation Costs	14
NEIGHBORHOOD TRAFFIC ANALYSIS	17
CONCLUSION AND RECOMMENDATION	17
CERTIFICATION STATEMENT	18

Figures

Exhibit 1: Vicinity Map	2
Exhibit 2: Study Intersections	4
Exhibit 3: 2014 Existing Traffic Volumes and Lane Assignments.....	5
Exhibit 4: Site Trip Distribution	8
Exhibit 5: Site Generated Traffic Volumes and Lane Assignments	9
Exhibit 6: 2016 Background Traffic Volumes and Lane Assignments	10
Exhibit 7: 2016 Total Traffic Volumes and Lane Assignments	11

Tables

Table 1 - Site Trip Generation	6
Table 2 - Site Trip Distribution	7
Table 3 – Level Of Service	12
Table 4 - Traffic Operational Results – Weekday AM Peak Hour	15
Table 5 – Traffic Operational Results – Weekday PM Peak Hour.....	16

Appendices

Appendix A: TIA Scoping Document	20
Appendix B: Traffic Counts.....	21
Appendix C: Site Trip Generation.....	22
Appendix D: Synchro Reports – Existing Condition	23
Appendix E: Synchro Reports – 2016 No-Build Existing Condition	24
Appendix F: Synchro Reports – 2016 Build-Out Conditions	25
Appendix G: Synchro Reports – Mitigations	26

EXECUTIVE SUMMARY

The proposed Champions Tract #3 Development will be located on the south side of FM 2222 between City Park Road and Loop 360 in Austin, Texas. The development will include 325 multi-family apartment units. The projected build-out year for the development is 2016. This study is intended to identify traffic generation characteristics, identify potential traffic related impacts on the local street system, and to develop mitigation measures required for identified impacts.

The proposed development will have access via two driveways, with one on FM 2222 and a second on City Park Road. The driveway on FM 2222 (Driveway 1) is anticipated to allow right-in-right-out movements only; the driveway on City Park Road (Driveway 2) is anticipated to provide full access. The site for the proposed development includes an eastern tract along FM 2222 adjacent to the Apartments. There is no development proposed on the eastern tract. If a new development is proposed on the eastern tract, access on FM 2222 will be limited to right-in-right-out movements only. All proposed site driveways will be stop sign controlled on the side street. Intersections to be analyzed were determined after discussion with City staff and are listed below. Additionally, all site driveways intersecting with external roads were also analyzed.

- Jester Blvd at FM 2222
- City Park Road at FM 2222
- Champion Grandview Way at FM 2222
- Loop 360 SB at FM 2222
- Loop 360 NB at FM 2222
- Lakewood Drive at FM 2222
- Loop 360 at Champion Grandview Way

Existing turning movement counts were collected at the above intersections during AM and PM peak-periods. The counts were increased by 10 percent to account for school traffic since the counts were collected when schools are out. Traffic operations were analyzed at the study intersections for existing conditions, 2016 No-Build, and 2016 Build-Out conditions. Background traffic was projected to 2016 by applying a two percent annual growth factor. Trips from the Office Development, which is currently under construction on the northeast corner of FM 2222 and Champions Grandview Way, were also added to the background trips in 2016.

The Apartment units are expected to generate approximately 163 new weekday AM peak hour one-way trips, and 196 new weekday PM peak hour one-way trips. Distribution of the site-generated traffic volumes onto the street system was developed in consultation with the City staff and was based on the surrounding roadway network, existing traffic patterns, and the project's proposed access locations.

Analysis showed several study intersections operate at LOS F under existing and 2016 No-Build conditions. Traffic from the proposed development will marginally increase delays at existing intersections. Mitigation measures were identified to restore operating conditions to 'No-Build' conditions. It may not be possible to restore all study intersections and approaches to LOS D or better without adding additional through capacity on FM 2222.

The following mitigation measures were identified as part of this study:

- At FM 2222 / Jester Blvd – adjust green splits to mitigate delays to 2016 No-Build conditions during both AM and PM peak-periods.
- At FM 2222 / City Park Road – adjust green splits to mitigate delays to 2016 No-Build conditions during both AM and PM peak-periods.
- At FM 2222 / Champion Grandview Way – construct a channelizing raised median to prevent left-turns out of the side street and allowing right-out movements only.
- At FM 2222 / Loop 360 – modify signal phasing and add an overlap to allow the northbound right-turn movement to run concurrently with the westbound through movement. With the modified phasing and split adjustments, delay at FM 2222 / Loop 360 SB will be restored to LOS D during both AM and PM peak-periods. Delays at FM 2222 / Loop 360 NB will be reduced to below existing conditions.

Driveway 1 on FM 2222 is expected to operate at LOS F. This is due to delays experienced by the outbound traffic from the site while waiting for a gap in the heavy conflicting through movement on FM 2222. It is not uncommon for side streets in urban environment to experience delays during AM and PM peak-periods. The following recommendations are made for the proposed driveways:

- Provide a raised channelized right-turn median island at Driveway 1 to allow right-in-right-out movements only and prevent any left-turns into/out of the site.

The Developer's pro-rata share of the cost of constructing the raised median island at Driveway 1 is 100 percent which is approximately \$25,000.

A neighborhood traffic analysis (NTA) was conducted due to the proposed development. The proposed development is planned to have one access point on City Park Road between Courtyard Dr. and FM 2222. As the proposed site generated traffic is not assigned to westbound City Park Road, no projected increase in site related trips will exceed the NTA threshold of "300 daily trips" as stated in Section 25 – 6 – 114 of the COA Land Development Code (LDC). Therefore, no impact to the operation of City Park Road as a neighborhood street as defined in the LDC is anticipated.

INTRODUCTION

A. PURPOSE

Kimley-Horn and Associates, Inc. (KHA) was retained to conduct a Traffic Impact Analysis (TIA) of future traffic conditions associated with the Champions Tract #3 Development consisting of 325 apartment units. The proposed development is located on the south side of FM 2222 between City Park Road and Loop 360 in Austin, Texas. A site vicinity map is provided in **Exhibit 1**. This study is intended to identify traffic generation characteristics and potential traffic related impacts on the local street system; and to develop mitigation measures required for identified impacts.

The Texas Department of Transportation (TxDOT) was consulted during the preparation of this study. In August, 2014 a meeting with TxDOT was held to discuss site access requirements and potential transportation improvement projects in the vicinity of the site. This report incorporates the results of this meeting.

B. METHODOLOGY

Traffic evaluation was comprised of three scenarios for which weekday AM and PM peak hour intersection level of service analyses were performed. The first scenario analyzed existing traffic conditions. The second scenario analyzed background traffic conditions in 2016 and the third scenario analyzed total build out traffic conditions in 2016. For both unsignalized and signalized intersections, the capacity analyses were conducted using the *Synchro* software package and its associated *Highway Capacity Manual* reports. Mitigation measures were identified at study intersections where operations due to site traffic were projected to fall below 'No-Build' conditions or level of service (LOS) level D.

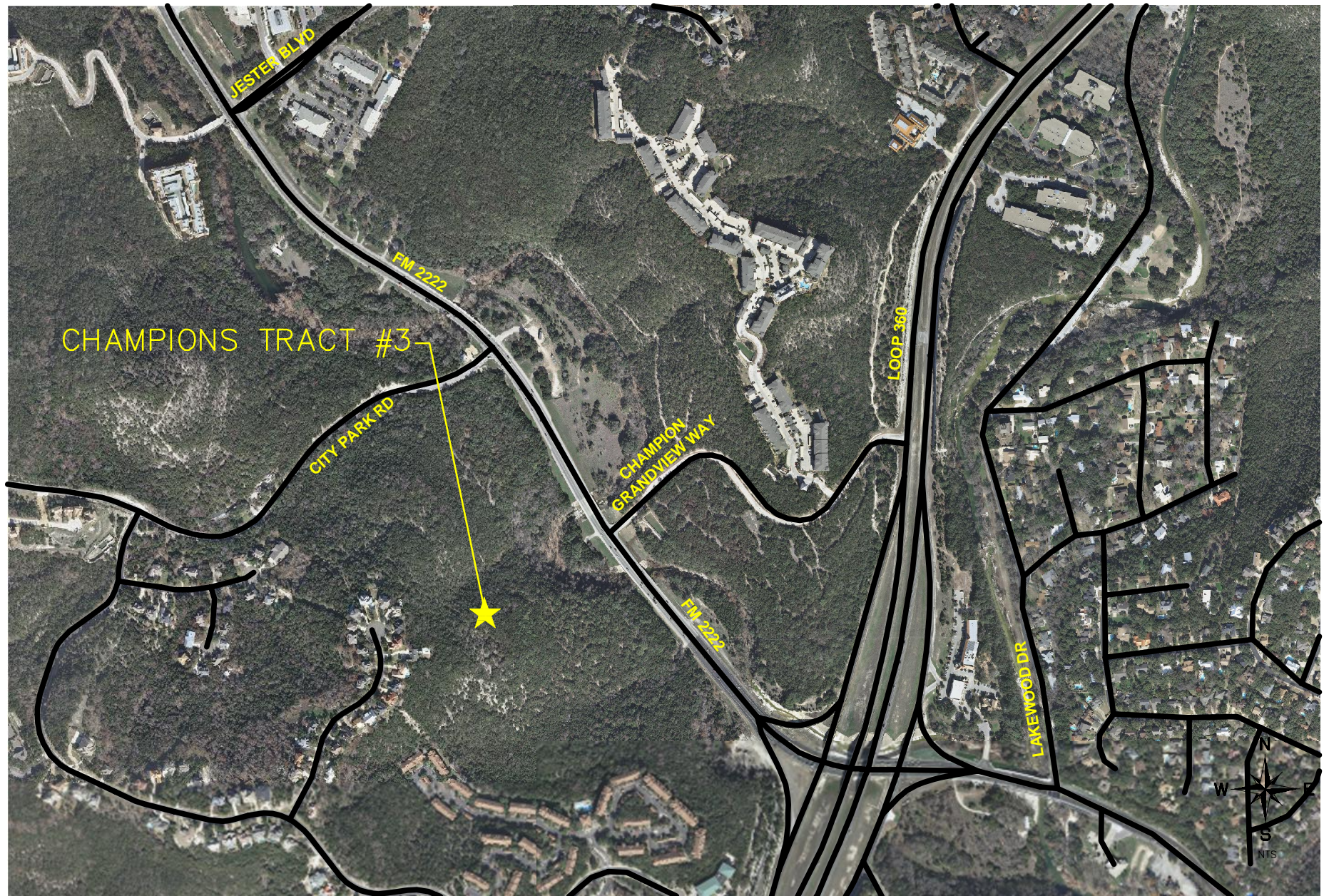
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EXHIBIT 1
VICINITY MAP

CHAMPIONS TRACT #3 DEVELOPMENT
AUSTIN, TEXAS

EXISTING AND FUTURE AREA CONDITIONS

A. ROADWAY CHARACTERISTICS

The proposed site is located approximately 1,000 feet to the west of the intersection of Loop 360 SB and FM 2222. The following existing intersections make up the study area:

- Jester Blvd at FM 2222
- City Park Road at FM 2222
- Champion Gateway Way at FM 2222
- Loop 360 SB at FM 2222
- Loop 360 NB at FM 2222
- Lakewood Drive at FM 2222
- Loop 360 at Champion Grandview Way

All study intersections are shown in **Exhibit 2**. The major study area roadways are described below. These intersections were identified in discussion with City of Austin staff. The approved TIA scoping document is provided in **Appendix A**.

FM 2222 – is a five-lane undivided major arterial road with a center two-way left-turn lane (TWLTL) in the project vicinity. The roadway generally runs in an east-west direction. In the project vicinity, FM 2222 has signalized intersections with Jester Blvd, City Park Road, Loop 360 SB, Loop 360 NB, and Lakewood Drive. FM 2222 also has an unsignalized intersection with Champions Grandview Way which intersects FM 2222 from the north and extends to intersection Loop 360 SB. FM 2222 has a posted speed limit of 60 MPH west of City Park Road, 55 MPH between City Park Road and Loop 360 and 45 MPH east of Lakewood Drive. FM 2222 has several horizontal and vertical curves in its alignment.

Loop 360 – is a four-lane divided highway with a posted speed limit of 55 MPH. In the project vicinity, Loop 360 generally runs in north-south direction and intersects with FM 2222 at a grade separated diamond intersection.

B. PROPOSED SITE DEVELOPMENT

As shown on **Exhibit 1**, the development will include 325 apartment units. Access to the site will be provided via a driveway on FM 2222 (Driveway 1) and a second driveway on City Park Road (Driveway 2). Driveway 1 is anticipated to provide limited access only allowing right-in-right-out movements to/from the site. Driveway 2 is anticipated to provide full access to the site. Site for the proposed project includes a tract east of the proposed 'Apartments' that is not anticipated to have any development. There will be no connection between the 'Apartments' and the eastern tract. There are severe topographical and environmental constraints between the tracts that make providing any internal connection extremely difficult and potentially detrimental to the environment. If the eastern tract is developed in the future, the future driveway on FM 2222 will be restricted to right-in-right-out movements only.

C. EXISTING TRAFFIC VOLUMES

Weekday AM and PM peak period turning movement counts were collected on July 29, 2014 at the study intersections. Since counts were collected while schools were not in session, a 10 percent growth factor was applied to account for school traffic. **Exhibit 3** shows existing weekday AM and PM peak hour traffic volumes with the 10 percent growth factor. The raw count sheets are provided in the **Appendix B**

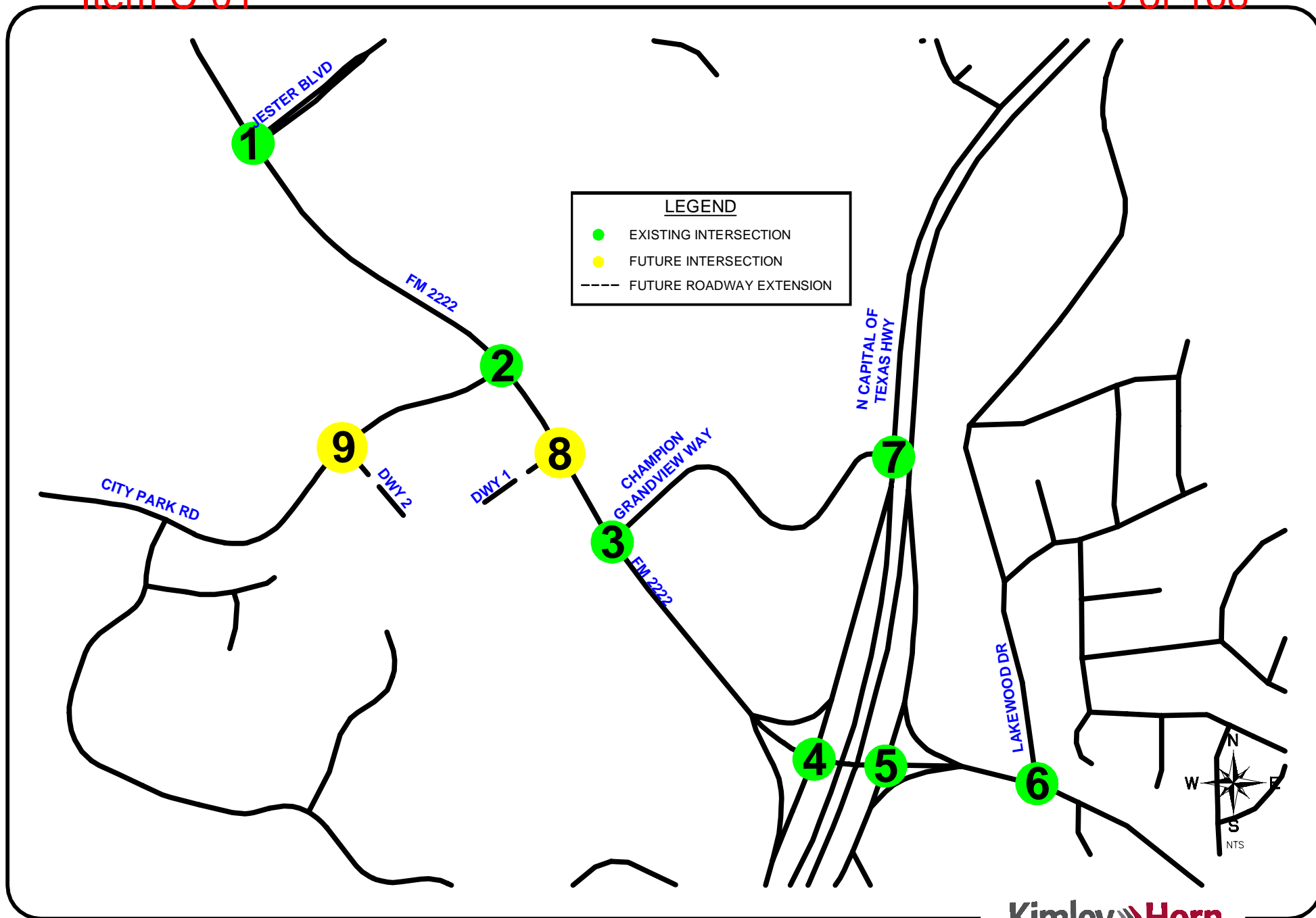
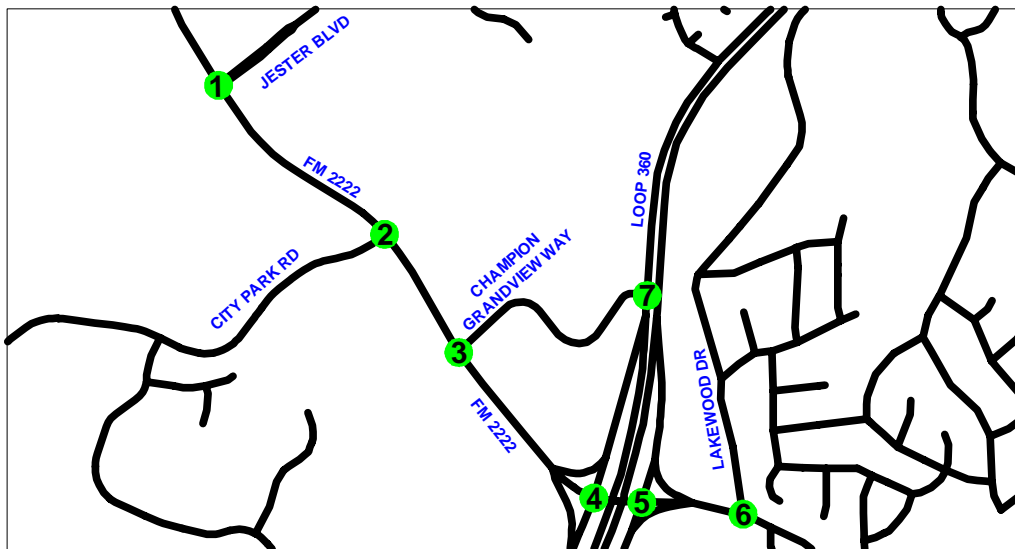
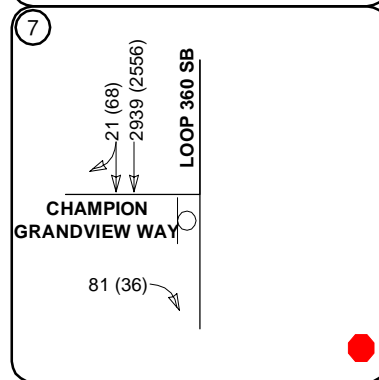
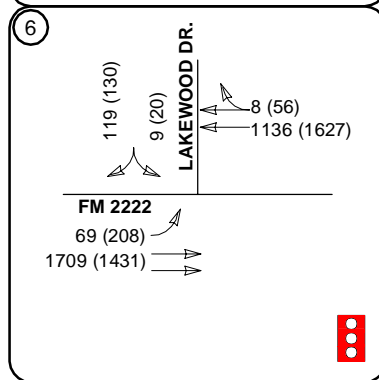
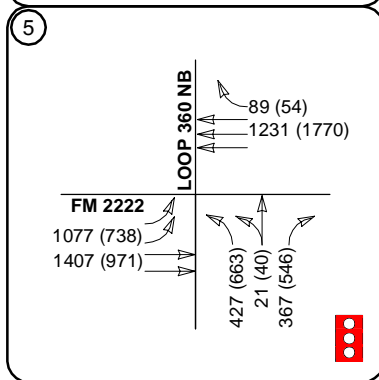
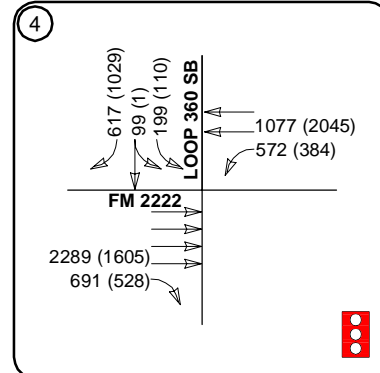
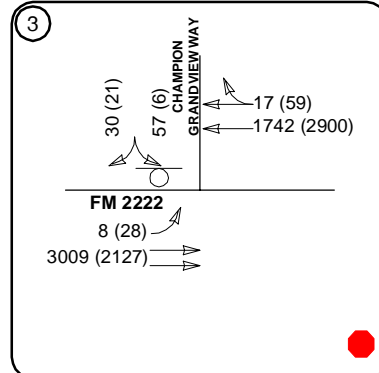
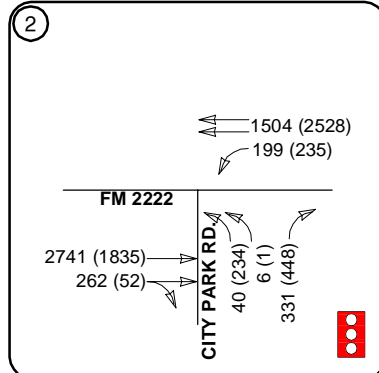
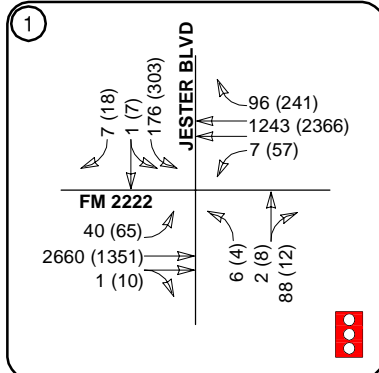
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EXHIBIT 2

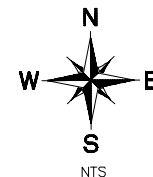
STUDY INTERSECTIONS

CHAMPIONS TRACT #3 DEVELOPMENT
AUSTIN, TEXAS



LEGEND:

- > TRAFFIC ASSIGNMENT
- XX AM PEAK-HR VEHICLES
- (XX) PM PEAK-HR VEHICLES
- STOP SIGN
- EXISTING INTERSECTIONS
- FUTURE INTERSECTIONS
- FUTURE ROADWAY EXTENSION
- ⬢ SIGNALIZED INTERSECTION
- UNSIGNALIZED INTERSECTION



PROJECT TRAFFIC CHARACTERISTICS

A. SITE-GENERATED TRAFFIC

Site-generated traffic estimates are determined through a process known as trip generation. Rates and equations are applied to each proposed land use to estimate traffic generated by the development during a specific time interval. The acknowledged source for trip generation rates is the 9th edition of *Trip Generation Manual* published by the Institute of Transportation Engineers (ITE). ITE has established trip rates in nationwide studies of similar land uses. The trips indicated are actually one-way trips or *trip ends*, where one vehicle entering and exiting the site is counted as two trips (one inbound trip and one outbound trip).

Reductions to the base trip generation estimates are sometimes applied due to internal capture or transit usage. Internal capture is the tendency for customers or residents to visit several parts of a mixed-use development in one trip, but be counted twice in the trip generation since the formulae assumes the land uses are isolated. Some internal capture occurs on the site between the office building and the retail center.

Pass-by trips are existing vehicles on the adjacent roadways that choose to visit the new site, and then return to their original path. Pass-by trips do not reduce the driveway volumes projected for the site, but are deducted from the net new traffic added to the area roadways, since they are already present.

No trip reductions were applied to the proposed residential development. **Table 1** summarizes the resulting Daily, and weekday AM and PM peak hour trip generation. Details of trip generation are provided in **Appendix C**.

Table 1 - Site Trip Generation

Land Uses	Amount	Units	ITE Code	Daily Trips	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
Apartment	325	DU	220	2,094	33	130	163	128	68	196
Internal Capture Trip Reduction				-	-	-	-	-	-	-
Pass-By Trip Reduction				-	-	-	-	-	-	-
TOTAL TRIPS				2,094	33	130	163	128	68	196

B. TRIP DISTRIBUTION AND ASSIGNMENT

The distribution of site-generated traffic volumes into and out of the site driveways and onto the street system was based on the area street system characteristics, existing traffic patterns, and the locations of the proposed driveway access to/from the site. **Table 2** displays the general directional distribution percentages assumed for the site which is also shown in **Exhibit 4**.

Table 2 - Site Trip Distribution

Direction	Residential Percent To/From
North (via Loop 360)	35%
South (via Loop 360)	25%
South (via City Park Road)	2%
East (via FM 2222)	25%
West (via FM 2222)	13%

Exhibit 5 shows the resulting weekday AM and weekday PM peak hour turning movements after multiplying the net new trip generation and the pass-by trip generation by the traffic assignment percentages.

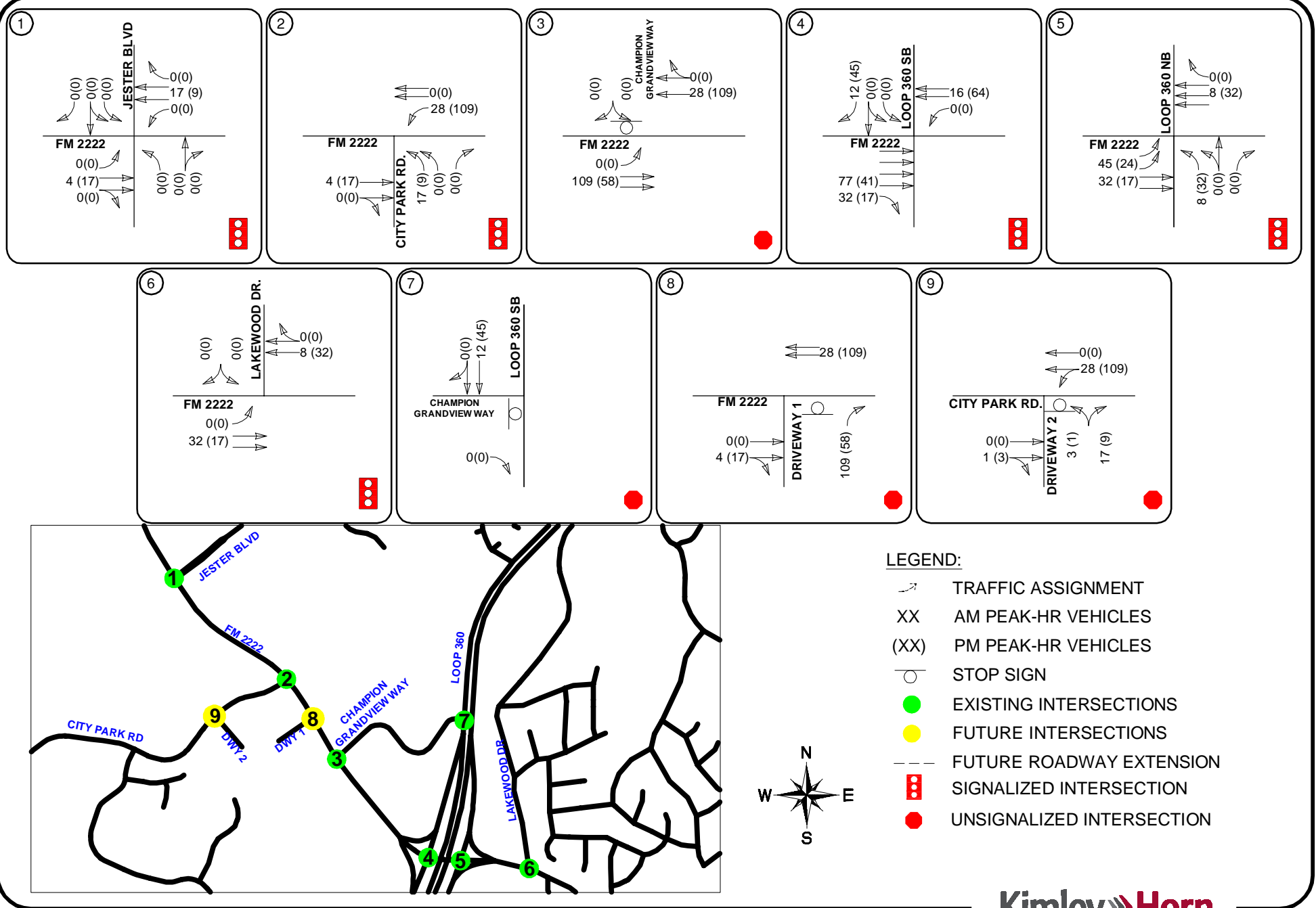
C. DEVELOPMENT OF 2016 BACKGROUND TRAFFIC

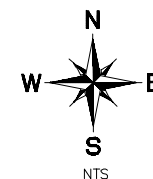
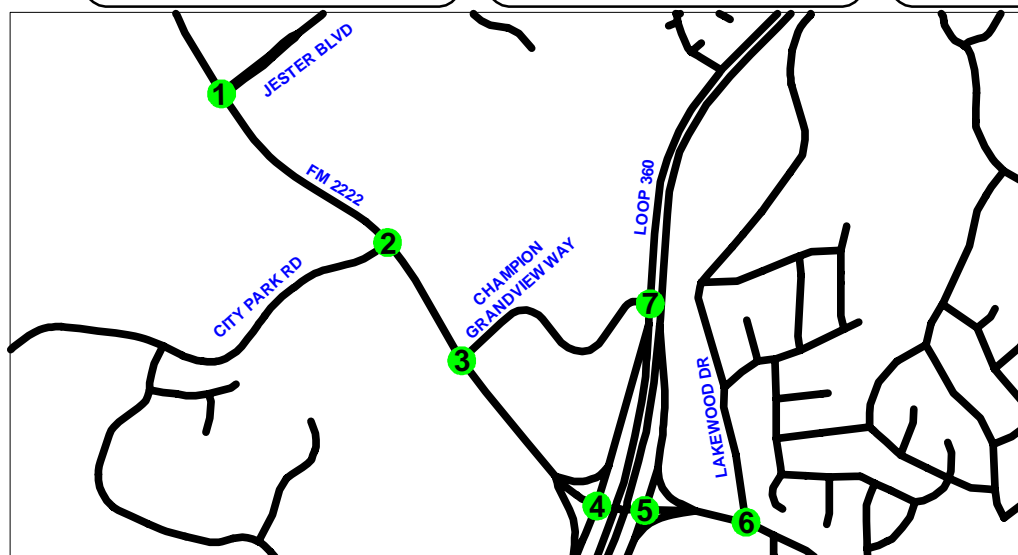
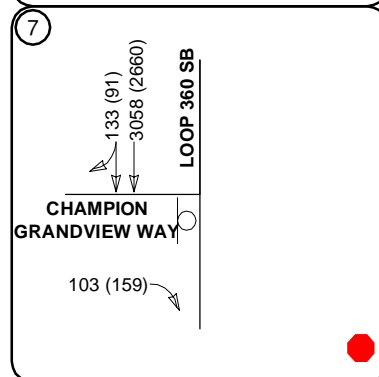
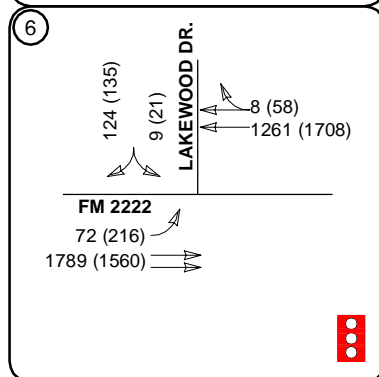
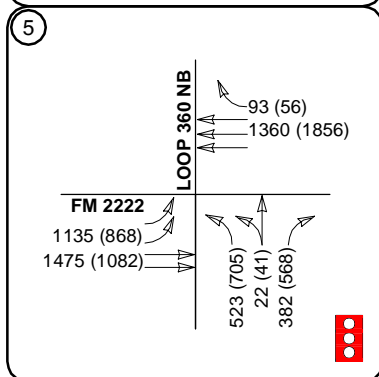
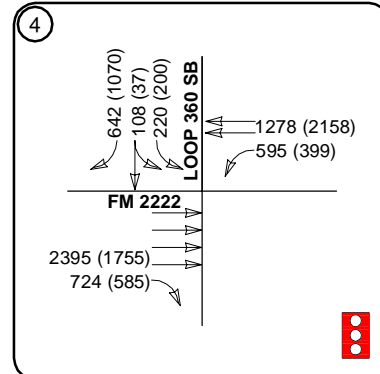
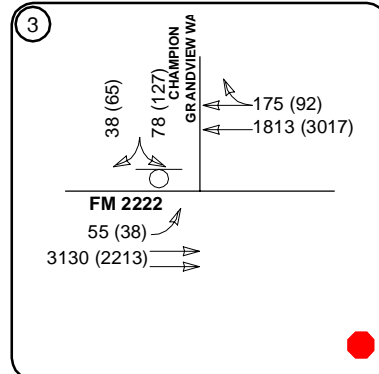
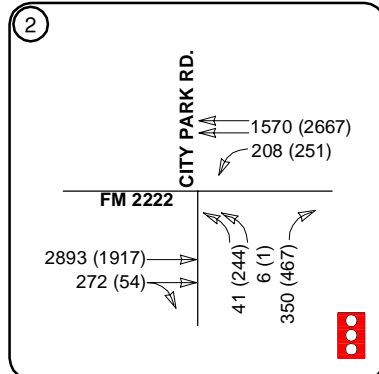
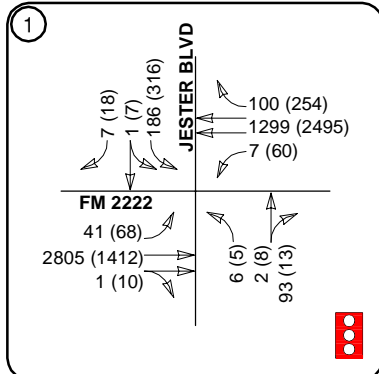
In order to obtain 2016 background traffic projections, the existing traffic counts and historic counts near the site were compared to find expected growth trends within the study area. Based on count data from TxDOT, traffic volumes around the study area have fluctuated greatly, and in most recent years show a negative trend. For a conservative analysis, traffic volume was assumed to increase at a growth rate of two percent per year. There is a proposed 230,000 square feet of 'Office Buildings' development on the northeast corner of FM 2222 and Champion Grandview Way. The proposed development is currently under construction and is anticipated to be completed before 2016. The trips from the Office development were added to the background traffic. The resulting 2016 background weekday AM and PM peak hour traffic volumes are shown in **Exhibit 6**.

D. DEVELOPMENT OF 2016 TOTAL TRAFFIC

Site traffic was added to the background volumes to represent estimated total (background plus site-generated) traffic conditions in 2016 after the completion of the proposed development. The resulting 2016 total weekday AM and PM peak hour traffic volumes are shown in **Exhibits 7**.



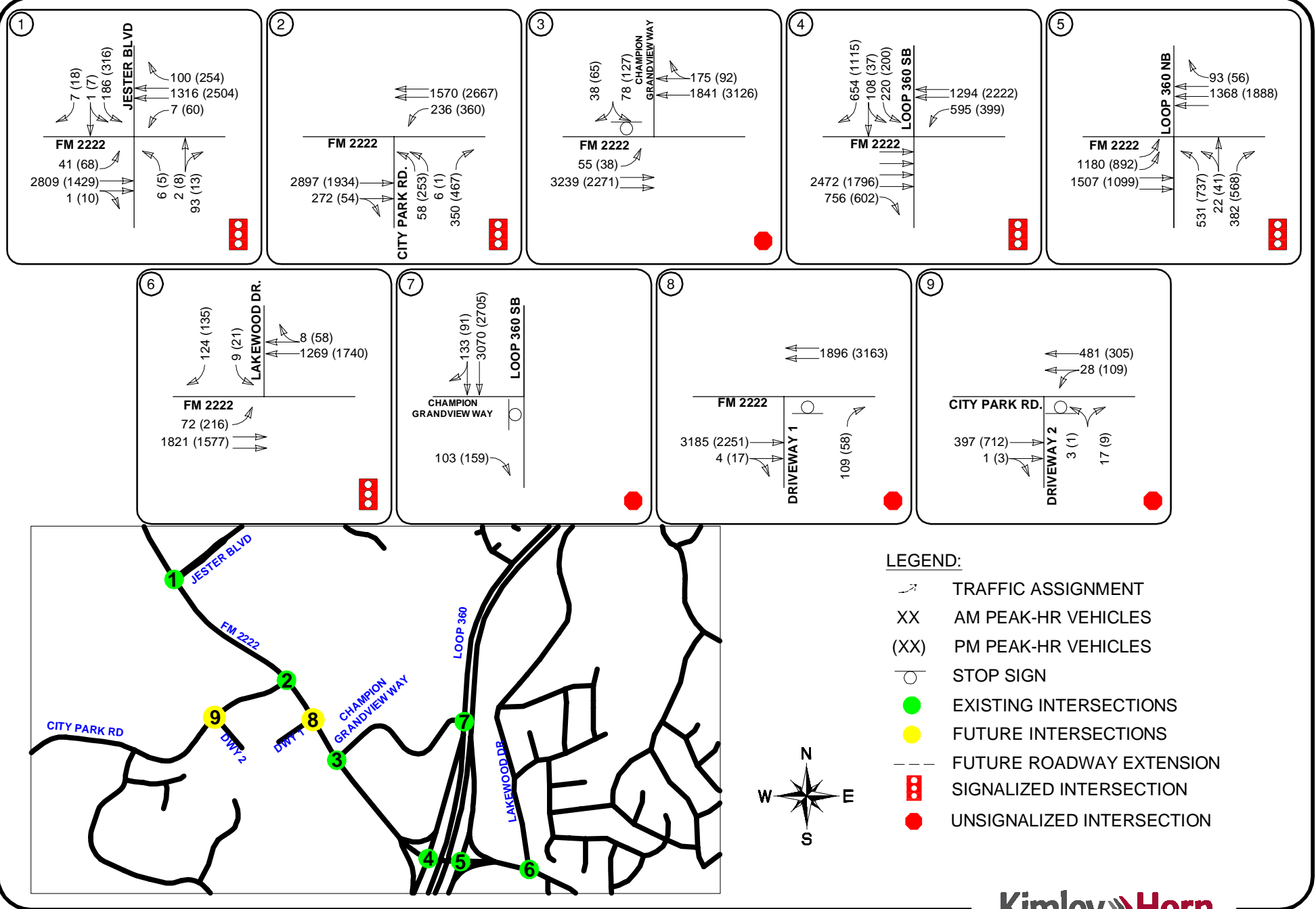




LEGEND:

- TRAFFIC ASSIGNMENT
- XX AM PEAK-HR VEHICLES
- (XX) PM PEAK-HR VEHICLES
- STOP SIGN
- EXISTING INTERSECTIONS
- FUTURE INTERSECTIONS
- FUTURE ROADWAY EXTENSION
- SIGNALIZED INTERSECTION
- UNSIGNALIZED INTERSECTION

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TRAFFIC OPERATIONS ANALYSIS

Kimley-Horn conducted a traffic operations analysis to determine potential capacity deficiencies in the 2016 study year at the study intersections. The acknowledged source for determining overall capacity is the current edition of the *Highway Capacity Manual*.

A. ANALYSIS METHODOLOGY

Capacity analysis results are listed in terms of Level of Service (LOS). LOS is a qualitative term describing operating conditions a driver will experience while traveling on a particular street or highway during a specific time interval. It ranges from A (very little delay) to F (long delays and congestion). **Table 3** shows the definition of level of service for signalized and unsignalized intersections. LOS D is considered the threshold for acceptable operations for signalized intersections.

Table 3 – Level Of Service

Level of Service	Signalized Intersection Average Total Delay (sec/veh)	Unsignalized Intersection Average Total Delay (sec/veh)
A	≤10	≤10
B	>10 and ≤20	>10 and ≤15
C	>20 and ≤35	>15 and ≤25
D	>35 and ≤55	>25 and ≤35
E	>55 and ≤80	>35 and ≤50
F	>80	>50

Definitions provided from the Highway Capacity Manual, Special Report 209, Transportation Research Board, 2010.

Study area intersections were analyzed based on average total delay analysis for signalized intersections. For the unsignalized analysis, the level of service (LOS) is defined for each controlled movement.

Calculations for the level of service at the key intersections identified for study are provided in **Appendix D-G**. The analyses assumed the lane geometry and intersection control for each year shown in **Exhibit 3**.

B. ANALYSIS RESULTS

2014 EXISTING TRAFFIC OPERATIONS

Analysis of the existing traffic operations shows that approaches at several study intersections operate at LOS E or LOS F during both the AM and PM peak-hours. The intersections at FM 2222 at Loop 360 SB and Lakewood Dr. at FM 2222 operate at LOS D or better during both the AM and PM peak-hour periods. During the AM peak-period there is heavy eastbound (EB) traffic and during the PM peak-period there is heavy westbound (WB) traffic on FM 2222 due to which the volume to capacity (v/c) ratios for these movements at most study intersections exceed 1.0. The heavy through movements on FM 2222 cause both signalized and unsignalized side streets to experience increased delays while waiting to turn on to FM 2222. Analysis results are shown in **Tables 4 & 5** and the detailed *Synchro* reports are provided in **Appendix D**.

2016 BACKGROUND/NO-BUILD TRAFFIC OPERATIONS

As shown in **Tables 4 & 5**, the annual traffic growth of two percent and addition of traffic from the Office development further increases delays at approaches at all the study intersections. The overall intersection at FM 2222 and Loop 360 SB operates at LOS D during both the AM and PM peak-hour, however, the eastbound approach on FM 2222 operates at LOS F. The overall intersection at FM 2222 at Lakewood Dr. operates at LOS A during the AM peak-hour and LOS B during the PM peak-hour; however due to heavy traffic on FM 2222, the SB approach operates at LOS E during both the peak-hours. All other study intersections operate at LOS E or LOS F. The side street delay at Champion Grandview Way and FM 2222 during the PM peak-hour exceeds the reporting range for delays in *Synchro* and therefore has been left blank. The primary reason for the extensive delay is that the side street has to wait for a gap in the heavy through traffic to turn left on to FM 2222. Detailed *Synchro* reports are provided in **Appendix E**.

2016 BUILD OUT TRAFFIC OPERATIONS

Addition of site traffic to the 2016 traffic volumes marginally increases delays at the study intersections compared to the 2016 No-Build conditions. **Tables 4 & 5** suggest that the proposed site Driveway 1 on FM 2222 will likely operate at LOS F. The right-turning site traffic at Driveway 1 will need to wait for a gap in thru' traffic on FM 2222 to make the turn. Due to heavy volumes in the eastbound direction on FM 2222, site traffic is anticipated to experience delays leading to LOS E/F. Detailed *Synchro* reports are provided in **Appendix F**.

C. MITIGATIONS AND IMPROVEMENTS

As **Tables 4** and **5** suggest several study intersections are failing under existing conditions. Traffic from the proposed site increases delays at existing signals marginally and as such mitigation measures were focused to restore operating conditions without the proposed development.

Site Driveway 1 on FM 2222 is planned to allow right-in-right-out movements only. It is recommended to add a raised channelized right-turn median island at the driveway to prevent any left-turns into/out of the driveway.

FM 2222 / Jester Blvd. – By adjusting the splits for each signal phase, delay at the intersection may be restored to 'No-Build' conditions or LOS D where delays exceed 'No-Build' scenario. The reduced delays are shown in **Tables 4** and **5**. Detailed Synchro reports are provided in **Appendix G**.

FM 2222 / City Park Road – By adjusting the splits for each signal phase, delay at the intersection may be restored to 'No-Build' conditions or LOS D where delays exceed 'No-Build' scenario. The reduced delays are shown in **Tables 4** & **5**. Detailed Synchro reports are provided in **Appendix G**.

FM 2222 / Champion Grandview Way – The SB approach at this intersections operates at LOS F under all scenarios primarily due to delays for the left-turn movements from Champion Grandview Way on to FM 2222. Existing pavement marking allows 'right-out' movements only at Champion Grandview Way. It is recommended to enforce right-out movements only at this location by installing a raised median and prohibiting left-out movements.

FM 2222 / Loop 360 – Currently, the intersection runs a TTI 4-phase diamond using a single ring sequential phasing. The northbound right-turn (NBR) lane data shows 382 and 568 vehicles during the AM and PM peak-hour respectively. Current phasing runs the NBR movement along with the NBT movement, which has a timing split of 29 seconds. Operating conditions may be improved by running the NBR movement as an additional overlap phase with the westbound through (WBT) movement. The current phasing runs eastbound through (EBT) movement (under the bridge) simultaneously with the westbound through (WBT) movement which will create a conflict with the proposed overlap for the NBR movement. Due to the sequence of movements in TTI 4-phase, there is no approach that is feeding the EBT movement under the bridge when the WBT movement is going. As a result the EBT movement may be terminated at the same time as the eastbound left-turn movement. This will provide an opportunity to run the NBR movement consecutively with the WBT movement. The improvements from this phasing change, along with split adjustment, are shown in **Tables 4** and **5**. Detailed Synchro reports are provided in **Appendix G**.

D. PRO-RATA SHARE OF MITIGATION COSTS

The pro-rata share of cost is estimated by multiplying the cost of implementing the required roadway/intersection improvements by the percentage of site trips in overall traffic using the roadway/intersection.

As discussed in the previous section, a raised channelizing median is recommended at Driveway 1 to allow right-in-right-out movements only and prevent left-turns into and out of the driveway. The cost of constructing this improvement is estimated to be approximately \$25,000. The Developer is responsible for 100 percent of the cost of this improvement.

Table 4 - Traffic Operational Results – Weekday AM Peak Hour

Intersection	Movement	Existing Conditions				2016 No-Build				2016 Build-Out				2016 Mitigated			
		95% Queue (ft)	V/C	Delay (sec)	LOS	95% Queue (ft)	V/C	Delay (sec)	LOS	95% Queue (ft)	V/C	Delay (sec)	LOS	95% Queue (ft)	V/C	Delay (sec)	LOS
Jester Blvd @ FM 2222	NB	145	0.61	5.7	A	178	0.64	6.6	A	187	0.65	6.8	A	167	0.64	6.1	A
	SB	1992	1.25	138.8	F	2151	1.32	171.7	F	2155	1.32	172.5	F	2130	1.31	166.7	F
	EB	34	0.42	67.1	E	40	0.47	67.4	E	40	0.47	67.4	E	44	0.5	68	E
	WB	160	0.54	60	E	167	0.56	60.4	E	167	0.56	60.4	E	170	0.58	61.9	E
City Park Rd @ FM 2222	NB	432	0.7	48.2	D	461	0.74	49.8	D	461	0.74	50.0	D	466	0.75	51.4	D
	EB	1954	1.58	281.7	F	1955	1.67	321.1	F	1956	1.68	322.0	F	1952	1.66	312.7	F
	WB	823	0.95	28.7	C	865	1.00	30.6	C	860	1.14	38.1	D	861	1.19	44.7	D
Champion Grandview Way @ FM 2222	SB	154	1.28	287.9	F	306	3.45	1321.2	F	314	3.85	1518.6	F	314	3.85	1518.6	F
	EB	4	0.06	17.4	C	60	0.54	37.9	E	60	0.56	39.6	E	60	0.56	39.6	E
	WB	Free	Free	Free	A	Free	Free	Free	A	Free	Free	Free	A	Free	Free	Free	A
Loop 360 SB @ FM 2222	SB	329	0.97	43.1	D	368	1.07	54.7	D	368	1.07	54.0	D	368	1.07	54.0	D
	EB	432	0.77	40.8	D	433	0.81	41.6	D	495	0.89	43.0	D	523	1.00	51.1	D
	WB	121	1.03	14.7	B	107	1.07	21	C	107	1.07	21.2	C	103	0.92	8.0	A
Loop 360 NB @ FM 2222	NB	571	1.81	337.6	F	644	1.91	414.7	F	654	1.91	419.8	F	618	1.64	304.6	F
	EB	131	0.67	5.3	A	158	0.71	5.6	A	79	0.74	3.9	A	56	0.82	5.0	A
	WB	724	1.16	149.1	F	847	1.27	195.4	F	853	1.28	197.8	F	780	1.13	129.2	F
Lakewood Dr @ FM 2222	SB	31	0.23	69	E	27	0.23	69	E	27	0.23	69	E	27	0.23	69	E
	EB	65	0.58	1.6	A	31	0.61	1.5	A	20	0.62	1.4	A	15	0.62	1.3	A
	WB	311	0.48	7.1	A	367	0.54	7.8	A	372	0.54	7.8	A	372	0.54	7.8	A
Loop 360 @ Champion	SB	Free	Free	Free	A	Free	Free	Free	A	Free	Free	Free	A	Free	Free	Free	A
	EB	140	1.06	184.1	F	235	1.72	457	F	236	1.74	467.4	F	240	1.78	488.8	F
Driveway 1 @ FM 2222	NB									194	1.54	389.9	F	196	1.56	399.6	F
	EB									Free	Free	Free	A	Free	Free	Free	A
City Park Rd @ Driveway 2	NB									-	0.04	12.3	B	-	0.04	12.4	B
	WBL									-	0.027	8.3	A	-	0.027	8.29	A

Note: 95% Queue lengths and V/C ratios shown correspond to worse of all movements at each approach; Delay and LOS correspond to overall approach

Table 5 – Traffic Operational Results – Weekday PM Peak Hour

Intersection	Movement	Existing Conditions				2016 No-Build				2016 Build-Out				2016 Mitigated			
		95% Queue (ft)	V/C	Delay (sec)	LOS	95% Queue (ft)	V/C	Delay (sec)	LOS	95% Queue (ft)	V/C	Delay (sec)	LOS	95% Queue (ft)	V/C	Delay (sec)	LOS
Jester Blvd @ FM 2222	NB	1585	1.13	75.4	E	1703	1.19	101.4	F	1713	1.20	103.0	F	1657	1.19	102.9	F
	SB	618	0.7	22.3	C	675	0.74	24.4	C	695	0.75	24.7	C	679	0.75	25.7	C
	EB	26	0.16	68.2	E	26	0.17	68.3	E	26	0.17	68.3	E	26	0.17	68.8	E
	WB	322	0.79	75.8	E	338	0.83	79.7	E	338	0.83	79.7	E	327	0.79	74.5	E
City Park Rd @ FM 2222	NB	667	1.37	188.1	F	715	1.43	208.3	F	717	1.43	260.9	F	726	1.47	214.0	F
	EB	1231	1.00	40.8	D	1305	1.04	52.2	D	1326	1.05	55.3	E	1335	1.04	51.5	D
	WB	1078	0.92	27.0	C	1192	0.97	32.7	C	1178	1.03	38.2	D	1575	1.14	48.9	D
Champion Grandview Way @ FM 2222	SB	86	0.951	224.6	F	850	16.1	7126	F	856	18.72	8386	F	856	18.72	8386	F
	EB	28	0.349	57.6	F	50	0.55	87.9	F	56	0.62	106	F	56	0.62	106	F
	WB	Free	Free	Free	A	Free	Free	Free	A	Free	Free	Free	A	Free	Free	Free	A
Loop 360 SB @ FM 2222	SB	114	0.71	9	A	362	1.03	36	D	362	1.03	35.4	D	385	1.17	47.7	D
	EB	504	1.07	71.6	E	562	1.17	102.7	F	587	1.20	112.5	F	532	1.05	69.4	E
	WB	44	0.73	4.4	A	43	0.77	5.5	A	43	0.79	6.2	A	45	0.78	9.1	A
Loop 360 NB @ FM 2222	NB	870	1.72	268.3	F	937	1.83	303.3	F	937	1.83	312.0	F	765	1.23	114.2	F
	EB	29	0.82	6.4	A	49	0.97	11.4	B	48	1.00	13.4	B	95	1.00	16.2	B
	WB	773	0.97	44.1	D	842	1.02	55.8	E	866	1.03	61.9	E	799	0.99	48.5	D
Lakewood Dr @ FM 2222	SB	47	0.49	70.1	E	56	0.55	71.5	E	56	0.55	71.5	E	56	0.55	71.5	E
	EB	632	0.78	14.9	B	695	0.80	16.0	B	705	0.80	16.1	B	700	0.80	12.5	B
	WB	841	0.84	26.2	C	934	0.89	30.6	C	973	0.91	32.1	C	973	0.91	32.1	C
Loop 360 @ Champion	SB	Free	Free	Free	A	Free	Free	Free	A	Free	Free	Free	A	Free	Free	Free	A
	EB	40	0.45	54	F	433	2.21	635.4	F	442	2.29	673.4	F	450	2.38	714.3	F
Driveway 1 @ FM 2222	NB									32	0.37	38.5	E	32	0.38	39.4	E
	EB									Free	Free	Free	A	Free	Free	Free	A
City Park Rd @ Driveway 2	NB									-	0.03	16.1	C	-	0.03	16.2	C
	WBL									-	0.14	10	A	-	0.14	10.0	B

Note: 95% Queue lengths and V/C ratios shown correspond to worse of all movements at each approach; Delay and LOS correspond to overall approach

NEIGHBORHOOD TRAFFIC ANALYSIS

A neighborhood traffic analysis (NTA) is required per the scope for the original TIA. The City Park Road operates as a Collector Road with no (or limited) direct residential frontage within 1,500 feet of the proposed development site. The proposed development is planned to have one access point on City Park Road between Courtyard Dr. and FM 2222. As the proposed site generated traffic is not assigned to westbound City Park Road, no projected increase in site related trips will exceed the NTA threshold of “300 daily trips” as stated in Section 25 – 6 – 114 of the COA Land Development Code. Therefore, no impact to the operation of City Park Road as a neighborhood street as defined in the LDC is anticipated.

CONCLUSION AND RECOMMENDATION

This study analyzed traffic impacts of the proposed Champions Tract 3 development on the southeast corner of FM 2222 and City Park Road. The different scenarios studied included – Existing conditions, 2016 No-Build, and 2016 Build-Out.

Analysis showed several study intersections operate at LOS F under existing and 2016 No-Build conditions. Traffic from the proposed development minimally increases delays at existing intersections. The following mitigation measures were identified as part of this study:

- At FM 2222 / Jester Blvd – adjust green splits to restore delays to 2016 No-Build conditions during both AM and PM peak-periods.
- At FM 2222 / City Park Road – adjust green splits to restore delays to 2016 No-Build conditions during both AM and PM peak-periods.
- At FM 2222 / Champion Grandview Way, provide a raised median to prevent left-turns out of the side street and allowing right-out movements only.
- At FM 2222 / Loop 360 – modify signal phasing and add an overlap phase to allow the northbound right-turn movement to run concurrently with the westbound through movement. With the modified phasing and split adjustments, delay at FM 2222 / Loop 360 SB may be restored to LOS D during both AM and PM peak-periods. Delays at FM 2222 / Loop 360 NB may be reduced to below existing conditions.

The proposed Driveway 1 on FM 2222 is expected to operate at LOS F. This is due to delays experienced by the outbound right-turning traffic from the site while waiting for a gap in the heavy conflicting through movement on FM 2222. It is not uncommon for side streets in urban environment to experience delays during AM and PM peak-periods. The following recommendations are made for the proposed driveways:


- Provide a raised channelizing right-turn median island at Driveway 1 to allow right-in-right-out movements only and prevent any left-turns into/out of the driveway.

The Developer's pro-rata share of the cost of constructing the raised channelized median island at Driveway 1 is 100 percent which is approximately \$25,000.

CERTIFICATION STATEMENT

I hereby certify that this report complies with the City Code and with applicable technical requirements of the City of Austin and is complete to the best of my knowledge.

KIMLEY-HORN AND ASSOCIATES


Vivek Deshpande, P.E. PTOE 04/20/16
Transportation Engineer

APPENDIX

Appendix A: TIA Scoping Document



TRAFFIC IMPACT ANALYSIS SCOPE AND STUDY AREA

Project Name: Champions Tract #3 Date: July 22, 2014
Location: Southeast corner of City Park Road/FM 2222
Owner's Agent: Kimley-Horn and Associates Phone: 512-418-4536
(Vivek Deshpande, P.E.)

- 1. Intersections.** Level of Service calculations for a.m. and p.m. peak hours must be performed for the following intersections, showing (a) existing traffic conditions and (b) projected traffic conditions for each phase, identifying site, non-site, and total traffic:

Note: New traffic counts are required for all intersections. Existing signal timings will be used for the intersection analyses in order to maintain adequate traffic progression, unless alternative timing proposals are approved by the Austin Transportation Department.

- a. City Park Road / FM 2222
- b. FM 2222 / Loop 360
- c. Jester Blvd. / FM 2222
- d. FM 2222 & Lakewood
- e. FM 2222 & Champion Grandview Way
- f. Loop 360 & Grandview Way
- g. Two (2) Proposed Site Access Driveways on RR 2222

- 2. Study Scenarios.** TIA will analyze the following scenarios:

- a. 2014 Existing Conditions
- b. 2016 No-Build
- c. 2016 Build-Out

- 3. Roadways.** A capacity analysis must be performed for the following roadway segments.

N/A

- 4. Neighborhood Impacts.** Neighborhood impacts must be evaluated for the following street segments, based upon the desirable operation levels described in Sec. 25-6-114 of the Land Development Code:

City Park Road

- 5. Data Assumptions.** The following assumptions must be included in the analysis. Any change in these assumptions must be approved by the transportation planner prior to submittal of the TIA.

- a. Background Traffic

Average annual growth rate to be determined from TxDOT ADT maps and previous intersection and roadway counts: A growth rate up to 2.0% may be applied.

Other Projects to be Included:

b. Internal trips

N/A

c. Pass-by Trips

N/A

d. Traffic Distribution

To be determined based on existing and historical distribution data.

Direction/Roadway	Site Traffic Distribution
Loop 360 North	35%
Loop 360 South	25%
FM 2222 East	25%
FM 2222 West	13%
City Park Road	2%
TOTAL	100%

e. Transit Trips

No transit trip reductions will be taken for this project.

6. Other Considerations:

- a. Each development phase to be analyzed, if proposed.
- b. Submit a CD containing
 - a. electronic PDF of the TIA,
 - b. Synchro files,
 - c. spreadsheets for trip distribution, trip generation, cost estimates, and
 - d. CAD files for the site plan.
- c. All intersections must be modeled in one Synchro file.
- d. A site plan for the proposed project.
- e. City of Austin timing sheets to be included in the Appendix of the TIA

Any change in these assumptions may require a change in the scope. For more detailed guidelines on preparation of the TIA, please see Sec. 2.0 – Traffic Impact Analysis from the Transportation Criteria Manual.

Prepared by: Sangeeta Jain 7/22/2014 Phone: 974-2219

**Watershed Protection and Development Review Department
CITY OF AUSTIN
TRAFFIC IMPACT ANALYSIS (TIA) DETERMINATION WORKSHEET**

APPLICANT MUST FILL IN WORKSHEET PRIOR TO SUBMITTING FOR TIA DETERMINATION

PROJECT NAME: Champions Tract #3

LOCATION: Southeast corner of City Park Road/RR 2222, Austin, Texas

APPLICANT: KIMLEY-HORN AND ASSOCIATES, INC TELEPHONE NO: 512-418-1771

APPLICATION STATUS: DEVELOPMENT ASSESSMENT: ZONING: X SITE PLAN:

EXISTING:**FOR OFFICE USE ONLY**

TRACT NUMBER	TRACT ACRES	BLDG SQ.FT.	ZONING	LAND USE	L.T.E CODE	TRIP RATE	TRIPS PER DAY

PROPOSED**FOR OFFICE USE ONLY**

TRACT NUMBER	TRACT ACRES	BLDG SQ.FT.	ZONING	LAND USE	L.T.E CODE	TRIP RATE	TRIPS PER DAY
		325 Units		Apartments	220	Eq	2,093
	42	50,000 SF		General Office Building	710	Eq	775
		30,000 SF		Specialty Retail Center	826	44.32	1,330

ABUTTING ROADWAYS**FOR OFFICE USE ONLY**

STREET NAME	PROPOSED ACCESS?	PAVEMENT WIDTH	CLASSIFICATION
City Park Road	Yes		
RR 2222	Yes		

FOR OFFICE USE ONLY

☒ A traffic impact analysis is required. The consultant preparing the study must meet with a transportation planner to discuss the scope and requirements of the study before beginning the study.

☐ A traffic impact analysis is NOT required. The traffic generated by the proposal does not exceed the thresholds established in the Land Development Code.

☐ The traffic impact analysis has been waived for the following reason: _____

☒ A neighborhood traffic analysis will be performed by the City for this project. The applicant may have to collect existing traffic counts. See a transportation planner for information.

REVIEWED BY:  DATE: 7/22/2014

DISTRIBUTION: FILE CAP. METRO SDHPT TRANS. REV. TRAVIS CO. TPSD TOTAL
COPIES: _____

NOTE: A TIA determination must be made prior to submittal of any zoning or site plan application, therefore, this completed and reviewed form MUST ACCOMPANY any subsequent application for the IDENTICAL project. CHANGES to the proposed project will REQUIRE a new TIA determination to be made.

Appendix B: Traffic Counts

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : RM2222-JesterBlvd072914AM
Site Code : 00000027
Start Date : 7/29/2014
Page No : 1

Groups Printed- Autos

	Jester Blvd Southbound					RM 2222 Westbound					Driveway Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00	28	0	2	0	30	2	218	9	0	229	1	0	12	0	13	3	505	1	0	509	781
07:15	31	1	1	0	33	2	282	18	0	302	1	1	16	0	18	7	614	1	0	622	975
07:30	44	0	1	0	45	1	266	16	0	283	0	0	17	0	17	9	643	0	0	652	997
07:45	34	0	0	0	34	2	278	21	0	301	3	0	25	0	28	5	583	0	0	588	951
Total	137	1	4	0	142	7	1044	64	0	1115	5	1	70	0	76	24	2345	2	0	2371	3704
08:00	51	0	4	0	55	1	304	32	0	337	1	1	22	0	24	15	578	0	0	593	1009
08:15	39	1	0	0	40	0	264	43	0	307	3	0	12	0	15	11	587	0	0	598	960
08:30	56	0	3	0	59	1	277	45	0	323	5	2	15	0	22	13	547	2	0	562	966
08:45	42	0	6	0	48	3	309	40	0	352	1	1	13	0	15	10	522	2	0	534	949
Total	188	1	13	0	202	5	1154	160	0	1319	10	4	62	0	76	49	2234	4	0	2287	3884
Grand Total	325	2	17	0	344	12	2198	224	0	2434	15	5	132	0	152	73	4579	6	0	4658	7588
Apprch %	94.5	0.6	4.9	0		0.5	90.3	9.2	0		9.9	3.3	86.8	0		1.6	98.3	0.1	0		
Total %	4.3	0	0.2	0	4.5	0.2	29	3	0	32.1	0.2	0.1	1.7	0	2	1	60.3	0.1	0	61.4	

	Jester Blvd Southbound					RM 2222 Westbound					Driveway Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15																					
07:15	31	1	1	0	33	2	282	18	0	302	1	1	16	0	18	7	614	1	0	622	975
07:30	44	0	1	0	45	1	266	16	0	283	0	0	17	0	17	9	643	0	0	652	997
07:45	34	0	0	0	34	2	278	21	0	301	3	0	25	0	28	5	583	0	0	588	951
08:00	51	0	4	0	55	1	304	32	0	337	1	1	22	0	24	15	578	0	0	593	1009
Total Volume	160	1	6	0	167	6	1130	87	0	1223	5	2	80	0	87	36	2418	1	0	2455	3932
% App. Total	95.8	0.6	3.6	0		0.5	92.4	7.1	0		5.7	2.3	92	0		1.5	98.5	0	0		
PHF	.784	.250	.375	.000	.759	.750	.929	.680	.000	.907	.417	.500	.800	.000	.777	.600	.940	.250	.000	.941	.974

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : RM2222-JesterBlvd072914AM
Site Code : 00000027
Start Date : 7/29/2014
Page No : 2

	Jester Blvd Southbound					RM 2222 Westbound					Driveway Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	08:00					08:00					07:45					07:15					
+0 mins.	51	0	4	0	55	1	304	32	0	337	3	0	25	0	28	7	614	1	0	622	
+15 mins.	39	1	0	0	40	0	264	43	0	307	1	1	22	0	24	9	643	0	0	652	
+30 mins.	56	0	3	0	59	1	277	45	0	323	3	0	12	0	15	5	583	0	0	588	
+45 mins.	42	0	6	0	48	3	309	40	0	352	5	2	15	0	22	15	578	0	0	593	
Total Volume	188	1	13	0	202	5	1154	160	0	1319	12	3	74	0	89	36	2418	1	0	2455	
% App. Total	93.1	0.5	6.4	0		0.4	87.5	12.1	0		13.5	3.4	83.1	0		1.5	98.5	0	0		
PHF	.839	.250	.542	.000	.856	.417	.934	.889	.000	.937	.600	.375	.740	.000	.795	.600	.940	.250	.000	.941	

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : RM2222-JesterBlvd072914PM
Site Code : 00000027
Start Date : 7/29/2014
Page No : 1

Groups Printed- Autos

	Jester Blvd Southbound					RM 2222 Westbound					Driveway Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
16:00	33	1	7	0	41	3	431	25	0	459	3	1	2	0	6	9	312	1	0	322	828
16:15	20	0	7	0	27	8	484	26	0	518	0	2	2	0	4	4	294	0	0	298	847
16:30	42	1	6	0	49	11	555	29	0	595	1	0	5	0	6	8	302	1	0	311	961
16:45	42	3	6	0	51	11	516	32	0	559	1	0	4	0	5	8	278	4	0	290	905
Total	137	5	26	0	168	33	1986	112	0	2131	5	3	13	0	21	29	1186	6	0	1221	3541
17:00	83	2	3	0	88	14	519	51	0	584	0	3	6	0	9	17	345	2	0	364	1045
17:15	62	1	2	0	65	9	545	57	0	611	0	0	0	0	0	20	289	2	0	311	987
17:30	72	1	8	0	81	13	562	66	0	641	3	2	1	0	6	10	296	4	0	310	1038
17:45	58	2	3	0	63	16	525	45	0	586	1	2	4	0	7	12	298	1	0	311	967
Total	275	6	16	0	297	52	2151	219	0	2422	4	7	11	0	22	59	1228	9	0	1296	4037
Grand Total	412	11	42	0	465	85	4137	331	0	4553	9	10	24	0	43	88	2414	15	0	2517	7578
Apprch %	88.6	2.4	9	0		1.9	90.9	7.3	0		20.9	23.3	55.8	0		3.5	95.9	0.6	0		
Total %	5.4	0.1	0.6	0	6.1	1.1	54.6	4.4	0	60.1	0.1	0.1	0.3	0	0.6	1.2	31.9	0.2	0	33.2	

	Jester Blvd Southbound					RM 2222 Westbound					Driveway Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 17:00																					
17:00	83	2	3	0	88	14	519	51	0	584	0	3	6	0	9	17	345	2	0	364	1045
17:15	62	1	2	0	65	9	545	57	0	611	0	0	0	0	0	20	289	2	0	311	987
17:30	72	1	8	0	81	13	562	66	0	641	3	2	1	0	6	10	296	4	0	310	1038
17:45	58	2	3	0	63	16	525	45	0	586	1	2	4	0	7	12	298	1	0	311	967
Total Volume	275	6	16	0	297	52	2151	219	0	2422	4	7	11	0	22	59	1228	9	0	1296	4037
% App. Total	92.6	2	5.4	0		2.1	88.8	9	0		18.2	31.8	50	0		4.6	94.8	0.7	0		
PHF	.828	.750	.500	.000	.844	.813	.957	.830	.000	.945	.333	.583	.458	.000	.611	.738	.890	.563	.000	.890	.966

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : RM2222-JesterBlvd072914PM
Site Code : 00000027
Start Date : 7/29/2014
Page No : 2

	Jester Blvd Southbound					RM 2222 Westbound					Driveway Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	17:00					17:00					16:15					17:00					
+0 mins.	83	2	3	0	88	14	519	51	0	584	0	2	2	0	4	17	345	2	0	364	
+15 mins.	62	1	2	0	65	9	545	57	0	611	1	0	5	0	6	20	289	2	0	311	
+30 mins.	72	1	8	0	81	13	562	66	0	641	1	0	4	0	5	10	296	4	0	310	
+45 mins.	58	2	3	0	63	16	525	45	0	586	0	3	6	0	9	12	298	1	0	311	
Total Volume	275	6	16	0	297	52	2151	219	0	2422	2	5	17	0	24	59	1228	9	0	1296	
% App. Total	92.6	2	5.4	0		2.1	88.8	9	0		8.3	20.8	70.8	0		4.6	94.8	0.7	0		
PHF	.828	.750	.500	.000	.844	.813	.957	.830	.000	.945	.500	.417	.708	.000	.667	.738	.890	.563	.000	.890	

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : RM2222-CityParkRd073114AM
Site Code : 00000026
Start Date : 7/31/2014
Page No : 1

Groups Printed- Autos

	Southbound					RM 2222 Westbound					City Park Rd Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00	0	0	0	0	0	15	194	0	0	209	1	0	30	0	31	0	488	10	0	498	738
07:15	0	0	0	0	0	24	268	0	0	292	3	0	48	0	51	0	648	26	1	675	1018
07:30	0	0	0	0	0	20	292	0	0	312	1	0	58	0	59	0	656	30	0	686	1057
07:45	0	0	0	0	0	38	309	0	0	347	7	0	50	0	57	0	622	40	0	662	1066
Total	0	0	0	0	0	97	1063	0	0	1160	12	0	186	0	198	0	2414	106	1	2521	3879
08:00	1	0	0	0	1	27	361	1	0	389	8	0	45	0	53	0	614	28	0	642	1085
08:15	0	0	0	0	0	37	332	0	0	369	13	0	59	0	72	0	618	45	0	663	1104
08:30	0	0	0	0	0	47	342	0	0	389	13	0	51	0	64	0	638	33	0	671	1124
08:45	0	0	0	0	0	37	377	0	0	414	8	0	58	0	66	0	572	47	0	619	1099
Total	1	0	0	0	1	148	1412	1	0	1561	42	0	213	0	255	0	2442	153	0	2595	4412
Grand Total	1	0	0	0	1	245	2475	1	0	2721	54	0	399	0	453	0	4856	259	1	5116	8291
Apprch %	100	0	0	0		9	91	0	0		11.9	0	88.1	0		0	94.9	5.1	0		
Total %	0	0	0	0	0	3	29.9	0	0	32.8	0.7	0	4.8	0	5.5	0	58.6	3.1	0	61.7	

	Southbound					RM 2222 Westbound					City Park Rd Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00																					
08:00	1	0	0	0	1	27	361	1	0	389	8	0	45	0	53	0	614	28	0	642	1085
08:15	0	0	0	0	0	37	332	0	0	369	13	0	59	0	72	0	618	45	0	663	1104
08:30	0	0	0	0	0	47	342	0	0	389	13	0	51	0	64	0	638	33	0	671	1124
08:45	0	0	0	0	0	37	377	0	0	414	8	0	58	0	66	0	572	47	0	619	1099
Total Volume	1	0	0	0	1	148	1412	1	0	1561	42	0	213	0	255	0	2442	153	0	2595	4412
% App. Total	100	0	0	0		9.5	90.5	0.1	0		16.5	0	83.5	0		0	94.1	5.9	0		
PHF	.250	.000	.000	.000	.250	.787	.936	.250	.000	.943	.808	.000	.903	.000	.885	.000	.957	.814	.000	.967	.981

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : RM2222-CityParkRd073114AM
Site Code : 00000026
Start Date : 7/31/2014
Page No : 2

	Southbound					RM 2222 Westbound					City Park Rd Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	07:15					08:00					08:00					07:15					
+0 mins.	0	0	0	0	0	27	361	1	0	389	8	0	45	0	53	0	648	26	1	675	
+15 mins.	0	0	0	0	0	37	332	0	0	369	13	0	59	0	72	0	656	30	0	686	
+30 mins.	0	0	0	0	0	47	342	0	0	389	13	0	51	0	64	0	622	40	0	662	
+45 mins.	1	0	0	0	1	37	377	0	0	414	8	0	58	0	66	0	614	28	0	642	
Total Volume	1	0	0	0	1	148	1412	1	0	1561	42	0	213	0	255	0	2540	124	1	2665	
% App. Total	100	0	0	0		9.5	90.5	0.1	0		16.5	0	83.5	0		0	95.3	4.7	0		
PHF	.250	.000	.000	.000	.250	.787	.936	.250	.000	.943	.808	.000	.903	.000	.885	.000	.968	.775	.250	.971	

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : RM2222-CityParkRd073114PM
Site Code : 00000026
Start Date : 7/31/2014
Page No : 1

Groups Printed- Autos

	Southbound					RM 2222 Westbound					City Park Rd Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
16:00	0	0	0	0	0	42	402	0	0	444	38	0	50	0	88	0	373	5	0	378	910
16:15	0	0	0	0	0	32	441	0	0	473	30	0	49	0	79	0	336	5	0	341	893
16:30	0	0	0	0	0	57	499	0	0	556	40	0	68	0	108	0	393	7	0	400	1064
16:45	0	0	0	0	0	55	541	1	0	597	46	0	56	0	102	0	365	5	0	370	1069
Total	0	0	0	0	0	186	1883	1	0	2070	154	0	223	0	377	0	1467	22	0	1489	3936
17:00	0	0	1	0	1	58	549	0	0	607	56	0	86	0	142	0	433	3	0	436	1186
17:15	0	0	0	0	0	62	544	0	0	606	51	0	112	0	163	0	465	3	0	468	1237
17:30	0	0	0	0	0	54	531	0	0	585	51	0	81	0	132	0	441	9	0	450	1167
17:45	0	0	1	0	1	53	578	1	0	632	35	0	47	0	82	0	396	10	0	406	1121
Total	0	0	2	0	2	227	2202	1	0	2430	193	0	326	0	519	0	1735	25	0	1760	4711
Grand Total	0	0	2	0	2	413	4085	2	0	4500	347	0	549	0	896	0	3202	47	0	3249	8647
Apprch %	0	0	100	0		9.2	90.8	0	0		38.7	0	61.3	0		0	98.6	1.4	0		
Total %	0	0	0	0	0	4.8	47.2	0	0	52	4	0	6.3	0	10.4	0	37	0.5	0	37.6	

	Southbound					RM 2222 Westbound					City Park Rd Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 17:00																					
17:00	0	0	1	0	1	58	549	0	0	607	56	0	86	0	142	0	433	3	0	436	1186
17:15	0	0	0	0	0	62	544	0	0	606	51	0	112	0	163	0	465	3	0	468	1237
17:30	0	0	0	0	0	54	531	0	0	585	51	0	81	0	132	0	441	9	0	450	1167
17:45	0	0	1	0	1	53	578	1	0	632	35	0	47	0	82	0	396	10	0	406	1121
Total Volume	0	0	2	0	2	227	2202	1	0	2430	193	0	326	0	519	0	1735	25	0	1760	4711
% App. Total	0	0	100	0		9.3	90.6	0	0		37.2	0	62.8	0		0	98.6	1.4	0		
PHF	.000	.000	.500	.000	.500	.915	.952	.250	.000	.961	.862	.000	.728	.000	.796	.000	.933	.625	.000	.940	.952

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : RM2222-CityParkRd073114PM
Site Code : 00000026
Start Date : 7/31/2014
Page No : 2

	Southbound					RM 2222 Westbound					City Park Rd Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	17:00					17:00					16:45					17:00					
+0 mins.	0	0	1	0	1	58	549	0	0	607	46	0	56	0	102	0	433	3	0	436	
+15 mins.	0	0	0	0	0	62	544	0	0	606	56	0	86	0	142	0	465	3	0	468	
+30 mins.	0	0	0	0	0	54	531	0	0	585	51	0	112	0	163	0	441	9	0	450	
+45 mins.	0	0	1	0	1	53	578	1	0	632	51	0	81	0	132	0	396	10	0	406	
Total Volume	0	0	2	0	2	227	2202	1	0	2430	204	0	335	0	539	0	1735	25	0	1760	
% App. Total	0	0	100	0		9.3	90.6	0	0		37.8	0	62.2	0		0	98.6	1.4	0		
PHF	.000	.000	.500	.000	.500	.915	.952	.250	.000	.961	.911	.000	.748	.000	.827	.000	.933	.625	.000	.940	

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : RM2222-ChampionGrandviewWay072914AM
Site Code : 00000026
Start Date : 7/29/2014
Page No : 1

Groups Printed- Autos

	Champion Grandview Way Southbound					RM 2222 Westbound					Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00	9	0	4	0	13	0	248	2	0	250	0	0	0	0	0	1	564	0	0	565	828
07:15	6	0	1	0	7	0	337	2	0	339	0	0	0	0	0	0	657	0	0	657	1003
07:30	8	0	3	0	11	0	324	2	0	326	0	0	0	0	0	2	725	0	0	727	1064
07:45	25	0	6	0	31	0	347	3	0	350	0	0	0	0	0	0	689	0	0	689	1070
Total	48	0	14	0	62	0	1256	9	0	1265	0	0	0	0	0	3	2635	0	0	2638	3965
08:00	13	0	8	0	21	0	410	4	0	414	0	0	0	0	0	1	685	0	0	686	1121
08:15	9	0	6	0	15	0	370	3	0	373	0	0	0	0	0	0	690	0	0	690	1078
08:30	15	0	5	0	20	0	380	2	0	382	0	0	0	0	0	2	718	0	0	720	1122
08:45	15	0	8	0	23	0	424	6	0	430	0	0	0	0	0	4	642	0	0	646	1099
Total	52	0	27	0	79	0	1584	15	0	1599	0	0	0	0	0	7	2735	0	0	2742	4420
Grand Total	100	0	41	0	141	0	2840	24	0	2864	0	0	0	0	0	10	5370	0	0	5380	8385
Apprch %	70.9	0	29.1	0		0	99.2	0.8	0		0	0	0	0		0.2	99.8	0	0		
Total %	1.2	0	0.5	0	1.7	0	33.9	0.3	0	34.2	0	0	0	0	0	0.1	64	0	0	64.2	

	Champion Grandview Way Southbound					RM 2222 Westbound					Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00																					
08:00	13	0	8	0	21	0	410	4	0	414	0	0	0	0	0	1	685	0	0	686	1121
08:15	9	0	6	0	15	0	370	3	0	373	0	0	0	0	0	0	690	0	0	690	1078
08:30	15	0	5	0	20	0	380	2	0	382	0	0	0	0	0	2	718	0	0	720	1122
08:45	15	0	8	0	23	0	424	6	0	430	0	0	0	0	0	4	642	0	0	646	1099
Total Volume	52	0	27	0	79	0	1584	15	0	1599	0	0	0	0	0	7	2735	0	0	2742	4420
% App. Total	65.8	0	34.2	0		0	99.1	0.9	0		0	0	0	0		0.3	99.7	0	0		
PHF	.867	.000	.844	.000	.859	.000	.934	.625	.000	.930	.000	.000	.000	.000	.000	.438	.952	.000	.000	.952	.985

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : RM2222-ChampionGrandviewWay072914AM
Site Code : 00000026
Start Date : 7/29/2014
Page No : 2

	Champion Grandview Way Southbound					RM 2222 Westbound					Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	07:45					08:00					07:00					07:30					
+0 mins.	25	0	6	0	31	0	410	4	0	414	0	0	0	0	0	2	725	0	0	727	
+15 mins.	13	0	8	0	21	0	370	3	0	373	0	0	0	0	0	0	689	0	0	689	
+30 mins.	9	0	6	0	15	0	380	2	0	382	0	0	0	0	0	1	685	0	0	686	
+45 mins.	15	0	5	0	20	0	424	6	0	430	0	0	0	0	0	0	690	0	0	690	
Total Volume	62	0	25	0	87	0	1584	15	0	1599	0	0	0	0	0	3	2789	0	0	2792	
% App. Total	71.3	0	28.7	0		0	99.1	0.9	0		0	0	0	0		0.1	99.9	0	0		
PHF	.620	.000	.781	.000	.702	.000	.934	.625	.000	.930	.000	.000	.000	.000	.000	.375	.962	.000	.000	.960	

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : RM2222-ChampionGrandviewWay072914PM
Site Code : 00000026
Start Date : 7/29/2014
Page No : 1

Groups Printed- Autos

	Champion Grandview Way Southbound					RM 2222 Westbound					Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
16:00	2	0	3	0	5	0	487	2	0	489	0	0	0	0	0	0	355	0	0	355	849
16:15	2	0	4	0	6	0	536	6	0	542	0	0	0	0	0	4	377	0	0	381	929
16:30	5	0	3	0	8	0	625	4	0	629	0	0	0	0	0	1	423	0	0	424	1061
16:45	3	0	3	0	6	0	648	4	0	652	0	0	0	0	0	2	397	0	0	399	1057
Total	12	0	13	0	25	0	2296	16	0	2312	0	0	0	0	0	7	1552	0	0	1559	3896
17:00	1	0	0	0	1	0	653	10	0	663	0	0	0	0	0	8	545	0	0	553	1217
17:15	0	0	10	0	10	0	646	14	0	660	0	0	0	0	0	5	496	0	0	501	1171
17:30	2	0	6	0	8	0	686	12	0	698	0	0	0	0	0	5	470	0	0	475	1181
17:45	2	0	3	0	5	0	651	18	0	669	0	0	0	0	0	7	423	0	0	430	1104
Total	5	0	19	0	24	0	2636	54	0	2690	0	0	0	0	0	25	1934	0	0	1959	4673
Grand Total	17	0	32	0	49	0	4932	70	0	5002	0	0	0	0	0	32	3486	0	0	3518	8569
Apprch %	34.7	0	65.3	0		0	98.6	1.4	0		0	0	0	0		0.9	99.1	0	0		
Total %	0.2	0	0.4	0	0.6	0	57.6	0.8	0	58.4	0	0	0	0	0	0.4	40.7	0	0	41.1	

	Champion Grandview Way Southbound					RM 2222 Westbound					Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 17:00																					
17:00	1	0	0	0	1	0	653	10	0	663	0	0	0	0	0	8	545	0	0	553	1217
17:15	0	0	10	0	10	0	646	14	0	660	0	0	0	0	0	5	496	0	0	501	1171
17:30	2	0	6	0	8	0	686	12	0	698	0	0	0	0	0	5	470	0	0	475	1181
17:45	2	0	3	0	5	0	651	18	0	669	0	0	0	0	0	7	423	0	0	430	1104
Total Volume	5	0	19	0	24	0	2636	54	0	2690	0	0	0	0	0	25	1934	0	0	1959	4673
% App. Total	20.8	0	79.2	0		0	98	2	0		0	0	0	0		1.3	98.7	0	0		
PHF	.625	.000	.475	.000	.600	.000	.961	.750	.000	.963	.000	.000	.000	.000	.000	.781	.887	.000	.000	.886	.960

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : RM2222-ChampionGrandviewWay072914PM
Site Code : 00000026
Start Date : 7/29/2014
Page No : 2

	Champion Grandview Way Southbound					RM 2222 Westbound					Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1 Peak Hour for Each Approach Begins at:																					
	16:00					17:00					16:00					17:00					
+0 mins.	2	0	3	0	5	0	653	10	0	663	0	0	0	0	0	8	545	0	0	553	
+15 mins.	2	0	4	0	6	0	646	14	0	660	0	0	0	0	0	5	496	0	0	501	
+30 mins.	5	0	3	0	8	0	686	12	0	698	0	0	0	0	0	5	470	0	0	475	
+45 mins.	3	0	3	0	6	0	651	18	0	669	0	0	0	0	0	7	423	0	0	430	
Total Volume	12	0	13	0	25	0	2636	54	0	2690	0	0	0	0	0	25	1934	0	0	1959	
% App. Total	48	0	52	0		0	98	2	0		0	0	0	0		1.3	98.7	0	0		
PHF	.600	.000	.813	.000	.781	.000	.961	.750	.000	.963	.000	.000	.000	.000	.000	.781	.887	.000	.000	.886	

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : Loop360SB-RM2222AM
Site Code : 00000024
Start Date : 7/29/2014
Page No : 1

Groups Printed- Autos

	Loop 360 Southbound					RM 2222 Westbound					Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00	30	0	129	0	159	41	132	0	0	173	0	0	0	0	0	0	351	155	0	506	838
07:15	28	2	113	0	143	65	153	0	0	218	0	0	0	0	0	0	453	187	0	640	1001
07:30	44	9	144	0	197	83	206	0	0	289	0	0	0	0	0	0	494	171	0	665	1151
07:45	45	15	119	0	179	106	189	0	0	295	0	0	0	0	0	0	611	187	0	798	1272
Total	147	26	505	0	678	295	680	0	0	975	0	0	0	0	0	0	1909	700	0	2609	4262
08:00	41	23	154	0	218	123	240	0	0	363	0	0	0	0	0	0	501	156	0	657	1238
08:15	43	19	144	0	206	127	230	0	0	357	0	0	0	0	0	0	531	160	0	691	1254
08:30	52	20	124	0	196	134	232	0	0	366	0	0	0	0	0	0	519	146	0	665	1227
08:45	45	28	139	0	212	136	277	0	0	413	0	0	0	0	0	0	530	166	0	696	1321
Total	181	90	561	0	832	520	979	0	0	1499	0	0	0	0	0	0	2081	628	0	2709	5040
Grand Total	328	116	1066	0	1510	815	1659	0	0	2474	0	0	0	0	0	0	3990	1328	0	5318	9302
Apprch %	21.7	7.7	70.6	0		32.9	67.1	0	0		0	0	0	0	0	0	75	25	0		
Total %	3.5	1.2	11.5	0	16.2	8.8	17.8	0	0	26.6	0	0	0	0	0	0	42.9	14.3	0	57.2	

	Loop 360 Southbound					RM 2222 Westbound					Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00																					
08:00	41	23	154	0	218	123	240	0	0	363	0	0	0	0	0	0	501	156	0	657	1238
08:15	43	19	144	0	206	127	230	0	0	357	0	0	0	0	0	0	531	160	0	691	1254
08:30	52	20	124	0	196	134	232	0	0	366	0	0	0	0	0	0	519	146	0	665	1227
08:45	45	28	139	0	212	136	277	0	0	413	0	0	0	0	0	0	530	166	0	696	1321
Total Volume	181	90	561	0	832	520	979	0	0	1499	0	0	0	0	0	0	2081	628	0	2709	5040
% App. Total	21.8	10.8	67.4	0		34.7	65.3	0	0		0	0	0	0	0	0	76.8	23.2	0		
PHF	.870	.804	.911	.000	.954	.956	.884	.000	.000	.907	.000	.000	.000	.000	.000	.000	.980	.946	.000	.973	.954

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : Loop360SB-RM2222AM
Site Code : 00000024
Start Date : 7/29/2014
Page No : 2

	Loop 360 Southbound					RM 2222 Westbound					Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	08:00					08:00					07:00					07:30					
+0 mins.	41	23	154	0	218	123	240	0	0	363	0	0	0	0	0	0	494	171	0	665	
+15 mins.	43	19	144	0	206	127	230	0	0	357	0	0	0	0	0	0	611	187	0	798	
+30 mins.	52	20	124	0	196	134	232	0	0	366	0	0	0	0	0	0	501	156	0	657	
+45 mins.	45	28	139	0	212	136	277	0	0	413	0	0	0	0	0	0	531	160	0	691	
Total Volume	181	90	561	0	832	520	979	0	0	1499	0	0	0	0	0	0	2137	674	0	2811	
% App. Total	21.8	10.8	67.4	0		34.7	65.3	0	0		0	0	0	0		0	76	24	0		
PHF	.870	.804	.911	.000	.954	.956	.884	.000	.000	.907	.000	.000	.000	.000	.000	.000	.874	.901	.000	.881	

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : Loop360SB-RM2222PM
Site Code : 00000024
Start Date : 7/29/2014
Page No : 1

Groups Printed- Autos

	Loop 360 Southbound					RM 2222 Westbound					Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
16:00	16	1	156	0	173	69	296	0	0	365	0	0	0	0	0	0	250	86	0	336	874
16:15	21	0	198	0	219	63	309	0	0	372	0	0	0	0	0	0	263	82	0	345	936
16:30	22	0	201	0	223	78	373	0	0	451	0	0	0	0	0	0	271	113	0	384	1058
16:45	27	0	221	0	248	68	430	0	0	498	0	0	0	0	0	0	300	125	0	425	1171
Total	86	1	776	0	863	278	1408	0	0	1686	0	0	0	0	0	0	1084	406	0	1490	4039
17:00	28	0	257	0	285	74	440	0	0	514	0	0	0	0	0	0	320	105	0	425	1224
17:15	23	0	232	0	255	83	470	0	0	553	0	0	0	0	0	0	384	142	0	526	1334
17:30	23	0	228	0	251	90	473	0	0	563	0	0	0	0	0	0	378	120	0	498	1312
17:45	26	1	218	0	245	102	476	0	0	578	0	0	0	0	0	0	377	113	0	490	1313
Total	100	1	935	0	1036	349	1859	0	0	2208	0	0	0	0	0	0	1459	480	0	1939	5183
Grand Total	186	2	1711	0	1899	627	3267	0	0	3894	0	0	0	0	0	0	2543	886	0	3429	9222
Apprch %	9.8	0.1	90.1	0		16.1	83.9	0	0		0	0	0	0	0	0	74.2	25.8	0		
Total %	2	0	18.6	0	20.6	6.8	35.4	0	0	42.2	0	0	0	0	0	0	27.6	9.6	0	37.2	

	Loop 360 Southbound					RM 2222 Westbound					Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 17:00																					
17:00	28	0	257	0	285	74	440	0	0	514	0	0	0	0	0	0	320	105	0	425	1224
17:15	23	0	232	0	255	83	470	0	0	553	0	0	0	0	0	0	384	142	0	526	1334
17:30	23	0	228	0	251	90	473	0	0	563	0	0	0	0	0	0	378	120	0	498	1312
17:45	26	1	218	0	245	102	476	0	0	578	0	0	0	0	0	0	377	113	0	490	1313
Total Volume	100	1	935	0	1036	349	1859	0	0	2208	0	0	0	0	0	0	1459	480	0	1939	5183
% App. Total	9.7	0.1	90.3	0		15.8	84.2	0	0		0	0	0	0	0	0	75.2	24.8	0		
PHF	.893	.250	.910	.000	.909	.855	.976	.000	.000	.955	.000	.000	.000	.000	.000	.000	.950	.845	.000	.922	.971

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : Loop360SB-RM2222PM
Site Code : 00000024
Start Date : 7/29/2014
Page No : 2

	Loop 360 Southbound					RM 2222 Westbound					Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	16:45					17:00					16:00					17:00					
+0 mins.	27	0	221	0	248	74	440	0	0	514	0	0	0	0	0	0	320	105	0	425	
+15 mins.	28	0	257	0	285	83	470	0	0	553	0	0	0	0	0	0	384	142	0	526	
+30 mins.	23	0	232	0	255	90	473	0	0	563	0	0	0	0	0	0	378	120	0	498	
+45 mins.	23	0	228	0	251	102	476	0	0	578	0	0	0	0	0	0	377	113	0	490	
Total Volume	101	0	938	0	1039	349	1859	0	0	2208	0	0	0	0	0	0	1459	480	0	1939	
% App. Total	9.7	0	90.3	0		15.8	84.2	0	0		0	0	0	0		0	75.2	24.8	0		
PHF	.902	.000	.912	.000	.911	.855	.976	.000	.000	.955	.000	.000	.000	.000	.000	.000	.950	.845	.000	.922	

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : Loop360NB-RM2222AM
Site Code : 00000020
Start Date : 7/29/2014
Page No : 1

Groups Printed- Autos

	Southbound					RM 2222 Westbound					Loop 360 Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00	0	0	0	0	0	0	91	7	0	98	82	3	48	0	133	184	202	0	0	386	617
07:15	0	0	0	0	0	0	137	4	0	141	82	3	44	0	129	198	274	0	0	472	742
07:30	0	0	0	0	0	0	185	6	0	191	106	2	68	0	176	227	314	0	0	541	908
07:45	0	0	0	0	0	0	204	8	0	212	97	2	60	0	159	268	376	0	0	644	1015
Total	0	0	0	0	0	0	617	25	0	642	367	10	220	0	597	877	1166	0	0	2043	3282
08:00	0	0	0	0	0	0	275	22	0	297	97	3	69	0	169	251	304	0	0	555	1021
08:15	0	0	0	0	0	0	260	14	0	274	92	5	105	0	202	268	313	0	0	581	1057
08:30	0	0	0	0	0	0	278	17	0	295	93	4	75	0	172	214	324	0	0	538	1005
08:45	0	0	0	0	0	0	306	28	0	334	106	7	85	0	198	246	338	0	0	584	1116
Total	0	0	0	0	0	0	1119	81	0	1200	388	19	334	0	741	979	1279	0	0	2258	4199
Grand Total	0	0	0	0	0	0	1736	106	0	1842	755	29	554	0	1338	1856	2445	0	0	4301	7481
Apprch %	0	0	0	0	0	0	94.2	5.8	0	94.2	56.4	2.2	41.4	0	56.4	43.2	56.8	0	0	56.8	
Total %	0	0	0	0	0	0	23.2	1.4	0	24.6	10.1	0.4	7.4	0	17.9	24.8	32.7	0	0	57.5	

	Southbound					RM 2222 Westbound					Loop 360 Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00																					
08:00	0	0	0	0	0	0	275	22	0	297	97	3	69	0	169	251	304	0	0	555	1021
08:15	0	0	0	0	0	0	260	14	0	274	92	5	105	0	202	268	313	0	0	581	1057
08:30	0	0	0	0	0	0	278	17	0	295	93	4	75	0	172	214	324	0	0	538	1005
08:45	0	0	0	0	0	0	306	28	0	334	106	7	85	0	198	246	338	0	0	584	1116
Total Volume	0	0	0	0	0	0	1119	81	0	1200	388	19	334	0	741	979	1279	0	0	2258	4199
% App. Total	0	0	0	0	0	0	93.2	6.8	0	93.2	52.4	2.6	45.1	0	52.4	43.4	56.6	0	0	56.6	
PHF	.000	.000	.000	.000	.000	.000	.914	.723	.000	.898	.915	.679	.795	.000	.917	.913	.946	.000	.000	.967	.941

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : Loop360NB-RM2222AM
Site Code : 00000020
Start Date : 7/29/2014
Page No : 2

	Southbound					RM 2222 Westbound					Loop 360 Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	07:00					08:00					08:00					07:30					
+0 mins.	0	0	0	0	0	0	275	22	0	297	97	3	69	0	169	227	314	0	0	541	
+15 mins.	0	0	0	0	0	0	260	14	0	274	92	5	105	0	202	268	376	0	0	644	
+30 mins.	0	0	0	0	0	0	278	17	0	295	93	4	75	0	172	251	304	0	0	555	
+45 mins.	0	0	0	0	0	0	306	28	0	334	106	7	85	0	198	268	313	0	0	581	
Total Volume	0	0	0	0	0	0	1119	81	0	1200	388	19	334	0	741	1014	1307	0	0	2321	
% App. Total	0	0	0	0	0	0	93.2	6.8	0		52.4	2.6	45.1	0		43.7	56.3	0	0		
PHF	.000	.000	.000	.000	.000	.000	.914	.723	.000	.898	.915	.679	.795	.000	.917	.946	.869	.000	.000	.901	

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : Loop360NB-RM2222PM
Site Code : 00000020
Start Date : 7/29/2014
Page No : 1

Groups Printed- Autos

	Southbound					RM 2222 Westbound					Loop 360 Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
16:00	0	0	0	0	0	0	235	12	0	247	121	13	74	0	208	109	134	0	0	243	698
16:15	0	0	0	0	0	0	255	15	0	270	124	8	95	0	227	148	129	0	0	277	774
16:30	0	0	0	0	0	0	316	12	0	328	134	2	104	0	240	145	148	0	0	293	861
16:45	0	0	0	0	0	0	349	5	0	354	148	5	111	0	264	140	187	0	0	327	945
Total	0	0	0	0	0	0	1155	44	0	1199	527	28	384	0	939	542	598	0	0	1140	3278
17:00	0	0	0	0	0	0	378	23	0	401	136	10	154	0	300	153	193	0	0	346	1047
17:15	0	0	0	0	0	0	402	10	0	412	149	8	123	0	280	184	218	0	0	402	1094
17:30	0	0	0	0	0	0	415	8	0	423	155	6	116	0	277	163	238	0	0	401	1101
17:45	0	1	0	0	1	0	414	8	0	422	163	12	103	0	278	171	234	0	0	405	1106
Total	0	1	0	0	1	0	1609	49	0	1658	603	36	496	0	1135	671	883	0	0	1554	4348
Grand Total	0	1	0	0	1	0	2764	93	0	2857	1130	64	880	0	2074	1213	1481	0	0	2694	7626
Apprch %	0	100	0	0		0	96.7	3.3	0		54.5	3.1	42.4	0		45	55	0	0		
Total %	0	0	0	0	0	0	36.2	1.2	0	37.5	14.8	0.8	11.5	0	27.2	15.9	19.4	0	0	35.3	

	Southbound					RM 2222 Westbound					Loop 360 Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 17:00																					
17:00	0	0	0	0	0	0	378	23	0	401	136	10	154	0	300	153	193	0	0	346	1047
17:15	0	0	0	0	0	0	402	10	0	412	149	8	123	0	280	184	218	0	0	402	1094
17:30	0	0	0	0	0	0	415	8	0	423	155	6	116	0	277	163	238	0	0	401	1101
17:45	0	1	0	0	1	0	414	8	0	422	163	12	103	0	278	171	234	0	0	405	1106
Total Volume	0	1	0	0	1	0	1609	49	0	1658	603	36	496	0	1135	671	883	0	0	1554	4348
% App. Total	0	100	0	0		0	97	3	0		53.1	3.2	43.7	0		43.2	56.8	0	0		
PHF	.000	.250	.000	.000	.250	.000	.969	.533	.000	.980	.925	.750	.805	.000	.946	.912	.928	.000	.000	.959	.983

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : Loop360NB-RM2222PM
Site Code : 00000020
Start Date : 7/29/2014
Page No : 2

	Southbound					RM 2222 Westbound					Loop 360 Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	17:00					17:00					17:00					17:00					
+0 mins.	0	0	0	0	0	0	378	23	0	401	136	10	154	0	300	153	193	0	0	346	
+15 mins.	0	0	0	0	0	0	402	10	0	412	149	8	123	0	280	184	218	0	0	402	
+30 mins.	0	0	0	0	0	0	415	8	0	423	155	6	116	0	277	163	238	0	0	401	
+45 mins.	0	1	0	0	1	0	414	8	0	422	163	12	103	0	278	171	234	0	0	405	
Total Volume	0	1	0	0	1	0	1609	49	0	1658	603	36	496	0	1135	671	883	0	0	1554	
% App. Total	0	100	0	0		0	97	3	0		53.1	3.2	43.7	0		43.2	56.8	0	0		
PHF	.000	.250	.000	.000	.250	.000	.969	.533	.000	.980	.925	.750	.805	.000	.946	.912	.928	.000	.000	.959	

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : RM2222-LakewoodDr072914AM
Site Code : 00000040
Start Date : 7/29/2014
Page No : 1

Groups Printed- Autos

	Lakewood Dr Southbound					RM 2222 Westbound					Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00	2	0	4	0	6	0	117	0	0	117	0	0	0	0	0	6	293	0	0	299	422
07:15	4	0	17	0	21	0	147	1	0	148	0	0	0	0	0	6	342	0	0	348	517
07:30	2	0	18	0	20	0	196	1	0	197	0	0	0	0	0	19	380	0	0	399	616
07:45	2	0	25	0	27	0	234	0	0	234	0	0	0	0	0	12	393	0	0	405	666
Total	10	0	64	0	74	0	694	2	0	696	0	0	0	0	0	43	1408	0	0	1451	2221
08:00	2	0	31	0	33	0	247	1	0	248	0	0	0	0	0	21	383	0	0	404	685
08:15	3	0	28	0	31	0	257	4	0	261	0	0	0	0	0	14	402	0	0	416	708
08:30	1	0	24	0	25	0	295	2	0	297	0	0	0	0	0	16	376	0	0	392	714
08:45	1	0	30	0	31	0	289	3	0	292	0	0	0	0	0	16	319	0	0	335	658
Total	7	0	113	0	120	0	1088	10	0	1098	0	0	0	0	0	67	1480	0	0	1547	2765
Grand Total	17	0	177	0	194	0	1782	12	0	1794	0	0	0	0	0	110	2888	0	0	2998	4986
Apprch %	8.8	0	91.2	0		0	99.3	0.7	0		0	0	0	0	0	3.7	96.3	0	0		
Total %	0.3	0	3.5	0	3.9	0	35.7	0.2	0	36	0	0	0	0	0	2.2	57.9	0	0	60.1	

	Lakewood Dr Southbound					RM 2222 Westbound					Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45																					
07:45	2	0	25	0	27	0	234	0	0	234	0	0	0	0	0	12	393	0	0	405	666
08:00	2	0	31	0	33	0	247	1	0	248	0	0	0	0	0	21	383	0	0	404	685
08:15	3	0	28	0	31	0	257	4	0	261	0	0	0	0	0	14	402	0	0	416	708
08:30	1	0	24	0	25	0	295	2	0	297	0	0	0	0	0	16	376	0	0	392	714
Total Volume	8	0	108	0	116	0	1033	7	0	1040	0	0	0	0	0	63	1554	0	0	1617	2773
% App. Total	6.9	0	93.1	0		0	99.3	0.7	0		0	0	0	0	0	3.9	96.1	0	0		
PHF	.667	.000	.871	.000	.879	.000	.875	.438	.000	.875	.000	.000	.000	.000	.000	.750	.966	.000	.000	.972	.971

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : RM2222-LakewoodDr072914AM
Site Code : 00000040
Start Date : 7/29/2014
Page No : 2

Start Time	Lakewood Dr Southbound					RM 2222 Westbound					Northbound					RM 2222 Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	

Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00					08:00					07:00					07:30				
+0 mins.	2	0	31	0	33	0	247	1	0	248	0	0	0	0	0	19	380	0	0	399
+15 mins.	3	0	28	0	31	0	257	4	0	261	0	0	0	0	0	12	393	0	0	405
+30 mins.	1	0	24	0	25	0	295	2	0	297	0	0	0	0	0	21	383	0	0	404
+45 mins.	1	0	30	0	31	0	289	3	0	292	0	0	0	0	0	14	402	0	0	416
Total Volume	7	0	113	0	120	0	1088	10	0	1098	0	0	0	0	0	66	1558	0	0	1624
% App. Total	5.8	0	94.2	0		0	99.1	0.9	0		0	0	0	0		4.1	95.9	0	0	
PHF	.583	.000	.911	.000	.909	.000	.922	.625	.000	.924	.000	.000	.000	.000	.000	.786	.969	.000	.000	.976

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : RM2222-LakewoodDr072914PM
Site Code : 00000040
Start Date : 7/29/2014
Page No : 1

Groups Printed- Autos

	Lakewood Dr Southbound					RM 2222 Westbound					Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
16:00	2	0	23	0	25	0	245	5	0	250	0	0	0	0	0	24	181	0	0	205	480
16:15	1	0	22	0	23	0	255	6	0	261	0	0	0	0	0	31	205	0	0	236	520
16:30	8	0	15	0	23	0	304	4	0	308	0	0	0	0	0	21	252	0	0	273	604
16:45	9	0	13	0	22	0	350	15	0	365	0	0	0	0	0	37	268	0	0	305	692
Total	20	0	73	0	93	0	1154	30	0	1184	0	0	0	0	0	113	906	0	0	1019	2296
17:00	7	0	23	0	30	1	345	10	0	356	0	0	0	0	0	43	335	0	0	378	764
17:15	0	0	31	0	31	0	377	13	0	390	0	0	0	0	0	42	361	0	0	403	824
17:30	4	0	30	0	34	0	351	13	0	364	0	0	0	0	0	62	298	0	0	360	758
17:45	7	0	34	0	41	0	406	15	0	421	0	0	0	0	0	42	307	0	0	349	811
Total	18	0	118	0	136	1	1479	51	0	1531	0	0	0	0	0	189	1301	0	0	1490	3157
Grand Total	38	0	191	0	229	1	2633	81	0	2715	0	0	0	0	0	302	2207	0	0	2509	5453
Apprch %	16.6	0	83.4	0		0	97	3	0		0	0	0	0		12	88	0	0		
Total %	0.7	0	3.5	0	4.2	0	48.3	1.5	0	49.8	0	0	0	0	0	5.5	40.5	0	0	46	

	Lakewood Dr Southbound					RM 2222 Westbound					Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 17:00																					
17:00	7	0	23	0	30	1	345	10	0	356	0	0	0	0	0	43	335	0	0	378	764
17:15	0	0	31	0	31	0	377	13	0	390	0	0	0	0	0	42	361	0	0	403	824
17:30	4	0	30	0	34	0	351	13	0	364	0	0	0	0	0	62	298	0	0	360	758
17:45	7	0	34	0	41	0	406	15	0	421	0	0	0	0	0	42	307	0	0	349	811
Total Volume	18	0	118	0	136	1	1479	51	0	1531	0	0	0	0	0	189	1301	0	0	1490	3157
% App. Total	13.2	0	86.8	0		0.1	96.6	3.3	0		0	0	0	0		12.7	87.3	0	0		
PHF	.643	.000	.868	.000	.829	.250	.911	.850	.000	.909	.000	.000	.000	.000	.000	.762	.901	.000	.000	.924	.958

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : RM2222-LakewoodDr072914PM
Site Code : 00000040
Start Date : 7/29/2014
Page No : 2

	Lakewood Dr Southbound					RM 2222 Westbound					Northbound					RM 2222 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	17:00					17:00					16:00					17:00					
+0 mins.	7	0	23	0	30	1	345	10	0	356	0	0	0	0	0	43	335	0	0	378	
+15 mins.	0	0	31	0	31	0	377	13	0	390	0	0	0	0	0	42	361	0	0	403	
+30 mins.	4	0	30	0	34	0	351	13	0	364	0	0	0	0	0	62	298	0	0	360	
+45 mins.	7	0	34	0	41	0	406	15	0	421	0	0	0	0	0	42	307	0	0	349	
Total Volume	18	0	118	0	136	1	1479	51	0	1531	0	0	0	0	0	189	1301	0	0	1490	
% App. Total	13.2	0	86.8	0		0.1	96.6	3.3	0		0	0	0	0		12.7	87.3	0	0		
PHF	.643	.000	.868	.000	.829	.250	.911	.850	.000	.909	.000	.000	.000	.000	.000	.762	.901	.000	.000	.924	

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : NCapitalofTexasHwy-ChampionGrandviewWay072914AM
Site Code : 00000034
Start Date : 7/29/2014
Page No : 1

Groups Printed- Autos

	N Capital of Texas Hwy Southbound					Westbound					N Capital of Texas Hwy Northbound					Champion Grandview Way Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00	0	555	9	0	564	0	0	0	0	0	0	397	0	0	397	0	0	16	0	16	977
07:15	0	603	3	0	606	0	0	0	0	0	0	459	0	0	459	0	0	9	0	9	1074
07:30	0	697	2	0	699	0	0	0	0	0	0	590	0	0	590	0	0	12	0	12	1301
07:45	0	679	5	0	684	0	0	0	0	0	0	773	0	0	773	0	0	25	0	25	1482
Total	0	2534	19	0	2553	0	0	0	0	0	0	2219	0	0	2219	0	0	62	0	62	4834
08:00	0	666	4	0	670	0	0	0	0	0	0	611	0	0	611	0	0	18	0	18	1299
08:15	0	630	8	0	638	0	0	0	0	0	0	708	0	0	708	0	0	19	0	19	1365
08:30	0	657	4	0	661	0	0	0	0	0	0	671	0	0	671	0	0	24	0	24	1356
08:45	0	669	5	0	674	0	0	0	0	0	0	723	0	0	723	0	0	31	0	31	1428
Total	0	2622	21	0	2643	0	0	0	0	0	0	2713	0	0	2713	0	0	92	0	92	5448
Grand Total	0	5156	40	0	5196	0	0	0	0	0	0	4932	0	0	4932	0	0	154	0	154	10282
Apprch %	0	99.2	0.8	0		0	0	0	0		0	100	0	0		0	0	100	0		
Total %	0	50.1	0.4	0	50.5	0	0	0	0	0	0	48	0	0	48	0	0	1.5	0	1.5	

	N Capital of Texas Hwy Southbound					Westbound					N Capital of Texas Hwy Northbound					Champion Grandview Way Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45																					
07:45	0	679	5	0	684	0	0	0	0	0	0	773	0	0	773	0	0	25	0	25	1482
08:00	0	666	4	0	670	0	0	0	0	0	0	611	0	0	611	0	0	18	0	18	1299
08:15	0	630	8	0	638	0	0	0	0	0	0	708	0	0	708	0	0	19	0	19	1365
08:30	0	657	4	0	661	0	0	0	0	0	0	671	0	0	671	0	0	24	0	24	1356
Total Volume	0	2632	21	0	2653	0	0	0	0	0	0	2763	0	0	2763	0	0	86	0	86	5502
% App. Total	0	99.2	0.8	0		0	0	0	0		0	100	0	0		0	0	100	0		
PHF	.000	.969	.656	.000	.970	.000	.000	.000	.000	.000	.000	.894	.000	.000	.894	.000	.000	.860	.000	.860	.928

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : NCapitalofTexasHwy-ChampionGrandviewWay072914AM
Site Code : 00000034
Start Date : 7/29/2014
Page No : 2

	N Capital of Texas Hwy Southbound					Westbound					N Capital of Texas Hwy Northbound					Champion Grandview Way Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	07:30					07:00					07:45					08:00					
+0 mins.	0	697	2	0	699	0	0	0	0	0	0	773	0	0	773	0	0	18	0	18	
+15 mins.	0	679	5	0	684	0	0	0	0	0	0	611	0	0	611	0	0	19	0	19	
+30 mins.	0	666	4	0	670	0	0	0	0	0	0	708	0	0	708	0	0	24	0	24	
+45 mins.	0	630	8	0	638	0	0	0	0	0	0	671	0	0	671	0	0	31	0	31	
Total Volume	0	2672	19	0	2691	0	0	0	0	0	0	2763	0	0	2763	0	0	92	0	92	
% App. Total	0	99.3	0.7	0		0	0	0	0		0	100	0	0		0	0	100	0		
PHF	.000	.958	.594	.000	.962	.000	.000	.000	.000	.000	.000	.894	.000	.000	.894	.000	.000	.742	.000	.742	

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : NCapitalofTexasHwy-ChampionGrandviewWay072914PM
Site Code : 00000034
Start Date : 7/29/2014
Page No : 1

Groups Printed- Autos

	N Capital of Texas Hwy Southbound					Westbound					N Capital of Texas Hwy Northbound					Champion Grandview Way Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
16:00	21	434	9	0	464	0	0	0	0	0	0	588	0	0	588	0	0	7	0	7	1059
16:15	0	534	9	0	543	0	0	0	0	0	0	728	0	0	728	0	0	9	0	9	1280
16:30	0	563	10	0	573	0	0	0	0	0	0	593	0	0	593	0	0	11	0	11	1177
16:45	0	571	10	0	581	0	0	0	0	0	0	629	0	0	629	0	0	10	0	10	1220
Total	21	2102	38	0	2161	0	0	0	0	0	0	2538	0	0	2538	0	0	37	0	37	4736
17:00	0	592	11	0	603	0	0	0	0	0	0	586	0	0	586	0	0	7	0	7	1196
17:15	0	567	12	0	579	0	0	0	0	0	0	722	0	0	722	0	0	13	0	13	1314
17:30	0	544	16	0	560	0	0	0	0	0	0	599	0	0	599	0	0	10	0	10	1169
17:45	0	621	23	0	644	0	0	0	0	0	0	659	0	0	659	0	0	3	0	3	1306
Total	0	2324	62	0	2386	0	0	0	0	0	0	2566	0	0	2566	0	0	33	0	33	4985
Grand Total	21	4426	100	0	4547	0	0	0	0	0	0	5104	0	0	5104	0	0	70	0	70	9721
Apprch %	0.5	97.3	2.2	0		0	0	0	0		0	100	0	0		0	0	100	0		
Total %	0.2	45.5	1	0	46.8	0	0	0	0	0	0	52.5	0	0	52.5	0	0	0.7	0	0.7	

	N Capital of Texas Hwy Southbound					Westbound					N Capital of Texas Hwy Northbound					Champion Grandview Way Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 17:00																					
17:00	0	592	11	0	603	0	0	0	0	0	0	586	0	0	586	0	0	7	0	7	1196
17:15	0	567	12	0	579	0	0	0	0	0	0	722	0	0	722	0	0	13	0	13	1314
17:30	0	544	16	0	560	0	0	0	0	0	0	599	0	0	599	0	0	10	0	10	1169
17:45	0	621	23	0	644	0	0	0	0	0	0	659	0	0	659	0	0	3	0	3	1306
Total Volume	0	2324	62	0	2386	0	0	0	0	0	0	2566	0	0	2566	0	0	33	0	33	4985
% App. Total	0	97.4	2.6	0		0	0	0	0		0	100	0	0		0	0	100	0		
PHF	.000	.936	.674	.000	.926	.000	.000	.000	.000	.000	.000	.889	.000	.000	.889	.000	.000	.635	.000	.635	.948

3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

File Name : NCapitalofTexasHwy-ChampionGrandviewWay072914PM
Site Code : 00000034
Start Date : 7/29/2014
Page No : 2

	N Capital of Texas Hwy Southbound					Westbound					N Capital of Texas Hwy Northbound					Champion Grandview Way Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	17:00					16:00					17:00					16:30					
+0 mins.	0	592	11	0	603	0	0	0	0	0	0	586	0	0	586	0	0	11	0	11	
+15 mins.	0	567	12	0	579	0	0	0	0	0	0	722	0	0	722	0	0	10	0	10	
+30 mins.	0	544	16	0	560	0	0	0	0	0	0	599	0	0	599	0	0	7	0	7	
+45 mins.	0	621	23	0	644	0	0	0	0	0	0	659	0	0	659	0	0	13	0	13	
Total Volume	0	2324	62	0	2386	0	0	0	0	0	0	2566	0	0	2566	0	0	41	0	41	
% App. Total	0	97.4	2.6	0		0	0	0	0		0	100	0	0		0	0	100	0		
PHF	.000	.936	.674	.000	.926	.000	.000	.000	.000	.000	.000	.889	.000	.000	.889	.000	.000	.788	.000	.788	

Appendix C: Site Trip Generation

Trip Generation Planner (ITE 9th Edition) - Summary Report
Kimley»Horn
Weekday Trip Generation
Trips Based on Average Rates/Equations
Project Name
Project Number
Champions Tract
069242000

ITE Code	Internal Capture Land Use	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Rates			Total Trips								Net Trips after Internal Capture								Net Trips after Internal Capture & Pass-By							
						Daily Rate	AM Rate	PM Rate	Daily Trips	AM Trips	PM Trips	AM Trips In	AM Trips Out	PM Trips In	PM Trips Out	Daily Trips	AM Trips	PM Trips	AM Trips In	AM Trips Out	PM Trips In	PM Trips Out	Daily Trips	AM Trips	PM Trips	AM Trips In	AM Trips Out	PM Trips In	PM Trips Out			
	Residential																															
	Office																															
	Retail																															
	Select Use																															
220		Apartment	Dwelling Unit(s)	325	Eq	N/A	N/A	N/A	2094	163	196	33	130	128	68	2094	163	196	33	130	128	68	2094	163	196	33	130	128	68			

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

- A Trip Generation data from ITE *Trip Generation, 9th Edition*
 B AM/PM rates correspond to peak of adjacent street traffic (if data available)
 C Includes weekday rates only
 D Total trips include pass-by trips w/ no internal capture
 E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
 F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
 G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation 9th Edition*

Appendix D: Synchro Reports – Existing Condition

Queues

Champions Tract #3 TIA

1: Jester Blvd & RM 2222

Existing Conditions - AM Peak



Lane Group	NBL	NBT	NBR	SBL	SBT	NEL	NET	SWL	SWT	SWR
Lane Configurations										
Volume (vph)	7	1243	96	40	2660	6	2	176	1	7
Lane Group Flow (vph)	9	1337	141	67	2834	14	114	115	115	18
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	5	2		1	6	7	4	3	8	
Permitted Phases	2		2	6		4	4	8		8
Detector Phase	5	2	2	1	6	7	4	3	8	8
Switch Phase										
Minimum Initial (s)	5.0	25.0	25.0	5.0	25.0	5.0	5.0	8.0	8.0	8.0
Minimum Split (s)	11.0	32.0	32.0	11.0	32.0	11.0	11.0	14.0	39.0	39.0
Total Split (s)	15.0	99.0	99.0	11.0	95.0	16.0	16.0	24.0	24.0	24.0
Total Split (%)	10.0%	66.0%	66.0%	7.3%	63.3%	10.7%	10.7%	16.0%	16.0%	16.0%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	7.0	7.0	6.0	7.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	None	None	None	None	None
v/c Ratio	0.07	0.58	0.13	0.28	1.15	0.12	0.74	0.54	0.54	0.05
Control Delay	4.6	5.5	0.5	9.9	94.8	68.5	58.9	68.5	68.5	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.6	5.5	0.5	9.9	94.8	68.5	58.9	68.5	68.5	0.3
Queue Length 50th (ft)	1	98	0	18	~1704	13	48	101	101	0
Queue Length 95th (ft)	m2	145	0	23	#1992	17	34	160	47	0
Internal Link Dist (ft)		362			394		655		292	
Turn Bay Length (ft)	215		180	225		150				
Base Capacity (vph)	157	2306	1069	237	2472	140	166	231	213	344
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.58	0.13	0.28	1.15	0.10	0.69	0.50	0.54	0.05

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Jester Blvd & RM 2222























ø1	ø2 (R)							ø3	ø4	
11 s	99 s							24 s	16 s	
ø5	ø6 (R)							ø8	ø7	
15 s	95 s							24 s	16 s	

HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

1: Jester Blvd & RM 2222

Existing Conditions - AM Peak

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	7	1243	96	40	2660	1	6	2	88	176	1	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	7.0	7.0	6.0	7.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.86		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	0.95	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3538		1770	1593		1681	1688	1583
Flt Permitted	0.04	1.00	1.00	0.13	1.00		0.68	1.00		0.47	0.46	1.00
Satd. Flow (perm)	80	3539	1583	250	3538		1265	1593		833	818	1583
Peak-hour factor, PHF	0.75	0.93	0.68	0.60	0.94	0.25	0.42	0.50	0.80	0.78	0.25	0.38
Adj. Flow (vph)	9	1337	141	67	2830	4	14	4	110	226	4	18
RTOR Reduction (vph)	0	0	41	0	0	0	0	59	0	0	0	15
Lane Group Flow (vph)	9	1337	100	67	2834	0	14	55	0	115	115	3
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6			4	4		8		8
Actuated Green, G (s)	94.1	92.9	92.9	101.1	96.4		12.5	12.5		23.4	23.4	23.4
Effective Green, g (s)	94.1	92.9	92.9	101.1	96.4		12.5	12.5		23.4	23.4	23.4
Actuated g/C Ratio	0.63	0.62	0.62	0.67	0.64		0.08	0.08		0.16	0.16	0.16
Clearance Time (s)	6.0	7.0	7.0	6.0	7.0		6.0	6.0		6.0	6.0	6.0
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)	63	2191	980	216	2273		118	132		214	214	246
v/s Ratio Prot	0.00	0.38		c0.01	c0.80		0.00	c0.03		c0.05	0.05	
v/s Ratio Perm	0.09		0.06	0.20			0.01			0.03	c0.03	0.00
v/c Ratio	0.14	0.61	0.10	0.31	1.25		0.12	0.42		0.54	0.54	0.01
Uniform Delay, d1	36.9	17.5	11.6	12.7	26.8		63.7	65.3		57.4	58.3	53.5
Progression Factor	0.50	0.29	0.10	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.8	1.0	0.2	0.8	114.9		0.5	2.1		2.6	2.6	0.0
Delay (s)	19.2	6.1	1.3	13.6	141.7		64.2	67.4		60.0	60.9	53.5
Level of Service	B	A	A	B	F		E	E		E	E	D
Approach Delay (s)		5.7			138.8			67.1			60.0	
Approach LOS		A			F			E			E	

Intersection Summary

HCM 2000 Control Delay	91.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	96.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Queues

Champions Tract #3 TIA

2: City Park Road & FM 2222

Existing Conditions - AM Peak



Lane Group	NBL	NBR	SET	NWL	NWT
Lane Configurations	←←	→	←→	→	→→
Volume (vph)	40	331	2741	199	1504
Lane Group Flow (vph)	49	368	3178	252	1600
Turn Type	NA	pt+ov	NA	pm+pt	NA
Protected Phases	4	4 5	6	5	2
Permitted Phases				2	
Detector Phase	4	4 5	6	5	2
Switch Phase					
Minimum Initial (s)	12.0		20.0	5.0	20.0
Minimum Split (s)	20.0		29.0	14.0	29.0
Total Split (s)	32.0		93.0	25.0	118.0
Total Split (%)	21.3%		62.0%	16.7%	78.7%
Yellow Time (s)	4.0		5.0	5.0	5.0
All-Red Time (s)	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0		7.0	7.0	7.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None		None	None	C-Max
v/c Ratio	0.08	0.69	1.58	0.95	0.61
Control Delay	52.6	50.4	283.2	77.2	21.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	52.6	50.4	283.2	77.2	21.0
Queue Length 50th (ft)	21	309	~2341	182	748
Queue Length 95th (ft)	36	432	m#1954	#286	823
Internal Link Dist (ft)	1125		1418		298
Turn Bay Length (ft)	500	500		215	
Base Capacity (vph)	595	527	2009	264	2628
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.08	0.70	1.58	0.95	0.61

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:NWTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.















Splits and Phases: 2: City Park Road & FM 2222



HCM Signalized Intersection Capacity Analysis

2: City Park Road & FM 2222

Champions Tract #3 TIA
Existing Conditions - AM Peak

						
Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations	 		 			 
Volume (vph)	40	331	2741	262	199	1504
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	7.0		7.0	7.0
Lane Util. Factor	0.97	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	1583	3485		1770	3539
Flt Permitted	0.95	1.00	1.00		0.04	1.00
Satd. Flow (perm)	3433	1583	3485		80	3539
Peak-hour factor, PHF	0.81	0.90	0.96	0.81	0.79	0.94
Adj. Flow (vph)	49	368	2855	323	252	1600
RTOR Reduction (vph)	0	1	6	0	0	0
Lane Group Flow (vph)	49	367	3172	0	252	1600
Turn Type	NA	pt+ov	NA		pm+pt	NA
Protected Phases	4	4 5	6		5	2
Permitted Phases					2	
Actuated Green, G (s)	25.6	49.8	86.2		111.4	111.4
Effective Green, g (s)	25.6	49.8	86.2		111.4	111.4
Actuated g/C Ratio	0.17	0.33	0.57		0.74	0.74
Clearance Time (s)	6.0		7.0		7.0	7.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	585	525	2002		264	2628
v/s Ratio Prot	0.01	c0.23	c0.91		c0.12	0.45
v/s Ratio Perm					0.59	
v/c Ratio	0.08	0.70	1.58		0.95	0.61
Uniform Delay, d1	52.3	43.6	31.9		55.7	9.1
Progression Factor	1.00	1.00	0.57		0.71	2.16
Incremental Delay, d2	0.1	4.1	263.3		40.7	1.0
Delay (s)	52.4	47.7	281.7		80.4	20.5
Level of Service	D	D	F		F	C
Approach Delay (s)	48.2		281.7			28.7
Approach LOS	D		F			C
Intersection Summary						
HCM 2000 Control Delay			177.8		HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio			1.34			
Actuated Cycle Length (s)			150.0		Sum of lost time (s)	20.0
Intersection Capacity Utilization			121.8%		ICU Level of Service	H
Analysis Period (min)			15			
c Critical Lane Group						

Intersection

Intersection Delay, s/veh 5.7

Movement	SEL	SET	NWT	NWR	SWL	SWR
Vol, veh/h	8	3009	1742	17	57	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	44	95	93	63	87	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	3167	1873	27	66	36

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1900	0	3507
Stage 1	-	-	1887
Stage 2	-	-	1620
Follow-up Headway	2.22	-	3.52
Pot Capacity-1 Maneuver	310	-	# 5
Stage 1	-	-	105
Stage 2	-	-	147
Time blocked-Platoon, %	-	-	-
Mov Capacity-1 Maneuver	310	-	# 5
Mov Capacity-2 Maneuver	-	-	# 57
Stage 1	-	-	105
Stage 2	-	-	138

Approach	SE	NW	SW
HCM Control Delay, s	0.1	0	287.9
HCM LOS			F

Minor Lane / Major Mvmt	NWT	NWR	SEL	SET	SWLn1
Capacity (veh/h)	-	-	310	-	79
HCM Lane V/C Ratio	-	-	0.059	-	1.281
HCM Control Delay (s)	-	-	17.335	-	287.9
HCM Lane LOS			C		F
HCM 95th %tile Q(veh)	-	-	0.186	-	7.706

Notes

~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Item C-01

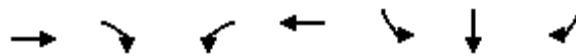
66 of 168

Queues

Champions Tract #3 TIA

4: Loop 360 SB & FM 2222

Existing Conditions - AM Peak



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR	ø1	ø2	ø4	ø5	ø6
Lane Configurations	↑↑↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑					
Volume (vph)	2289	691	572	1077	199	99	617					
Lane Group Flow (vph)	2336	727	596	1224	174	179	678					
Turn Type	NA	Free	pm+pt	NA	Split	NA	Free					
Protected Phases	1 2		6 7	1 2 6 7	4 5	4 5		1	2	4	5	6
Permitted Phases		Free	1 2 6 7				Free					
Detector Phase	1 2		6 7	1 2 6 7	4 5	4 5						
Switch Phase												
Minimum Initial (s)								1.0	25.0	5.0	1.0	12.0
Minimum Split (s)								7.0	31.0	11.0	8.0	22.0
Total Split (s)								8.0	69.0	14.0	8.0	36.0
Total Split (%)								5%	46%	9%	5%	24%
Yellow Time (s)								4.0	4.0	4.0	4.0	4.0
All-Red Time (s)								2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag								Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?								Yes	Yes	Yes	Yes	Yes
Recall Mode								None	C-Max	None	None	None
v/c Ratio	0.77	0.46	1.03	0.43	0.97	0.97	0.43					
Control Delay	53.9	0.1	42.5	2.0	125.7	123.6	0.8					
Queue Delay	0.1	0.0	0.0	49.9	0.0	0.0	0.0					
Total Delay	54.0	0.1	42.5	51.9	125.7	123.6	0.8					
Queue Length 50th (ft)	673	0	~562	0	182	186	0					
Queue Length 95th (ft)	m432	m0	m121	m0	#329	#292	0					
Internal Link Dist (ft)	712			342		1059						
Turn Bay Length (ft)												
Base Capacity (vph)	3033	1583	580	2878	179	185	1583					
Starvation Cap Reductn	0	0	0	1814	0	0	0					
Spillback Cap Reductn	65	0	0	0	0	0	0					
Storage Cap Reductn	0	0	0	0	0	0	0					
Reduced v/c Ratio	0.79	0.46	1.03	1.15	0.97	0.97	0.43					

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

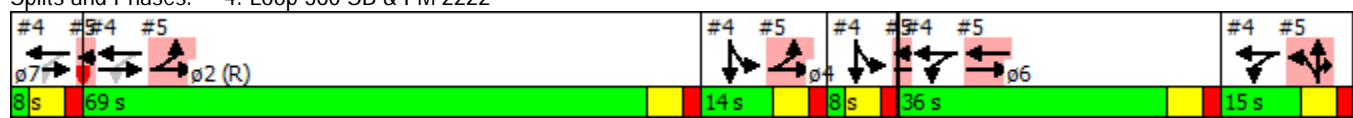
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Loop 360 SB & FM 2222















HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

4: Loop 360 SB & FM 2222

Existing Conditions - AM Peak

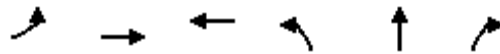
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↗	↖	↑↑					↖	↗	↗
Volume (vph)	0	2289	691	572	1077	0	0	0	0	199	99	617
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0	6.0	4.0
Lane Util. Factor		0.86	1.00	1.00	0.95					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.98	1.00
Satd. Flow (prot)		6408	1583	1770	3539					1681	1743	1583
Flt Permitted		1.00	1.00	0.06	1.00					0.95	0.98	1.00
Satd. Flow (perm)		6408	1583	105	3539					1681	1743	1583
Peak-hour factor, PHF	0.92	0.98	0.95	0.96	0.88	0.92	0.92	0.92	0.92	0.87	0.80	0.91
Adj. Flow (vph)	0	2336	727	596	1224	0	0	0	0	229	124	678
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2336	727	596	1224	0	0	0	0	174	179	678
Turn Type		NA	Free	pm+pt	NA					Split	NA	Free
Protected Phases		1 2		6 7	1 2 6 7					4 5	4 5	
Permitted Phases			Free	1 2 6 7								Free
Actuated Green, G (s)		71.0	150.0	116.0	122.0					16.0	16.0	150.0
Effective Green, g (s)		71.0	150.0	116.0	122.0					16.0	16.0	150.0
Actuated g/C Ratio		0.47	1.00	0.77	0.81					0.11	0.11	1.00
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)		3033	1583	580	2878					179	185	1583
v/s Ratio Prot		0.36		c0.31	0.35					c0.10	0.10	
v/s Ratio Perm			0.46	c0.49								0.43
v/c Ratio		0.77	0.46	1.03	0.43					0.97	0.97	0.43
Uniform Delay, d1		32.7	0.0	46.4	4.0					66.8	66.7	0.0
Progression Factor		1.63	1.00	0.47	0.50					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.1	19.2	0.0					58.7	56.1	0.8
Delay (s)		53.5	0.1	40.9	2.0					125.5	122.8	0.8
Level of Service		D	A	D	A					F	F	A
Approach Delay (s)		40.8			14.7			0.0			43.1	
Approach LOS		D			B			A			D	
Intersection Summary												
HCM 2000 Control Delay			33.2			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			1.18									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)				36.0		
Intersection Capacity Utilization			88.0%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

Queues

Champions Tract #3 TIA

5: Loop 360 NB & FM 2222

Existing Conditions - AM Peak



Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	ø1	ø2	ø4	ø5	ø6	ø7
Lane Configurations	↔↔	↑↑	↑↑↑	↔	↔	↔						
Volume (vph)	1077	1407	1231	427	21	367						
Lane Group Flow (vph)	1184	1481	1477	246	249	459						
Turn Type	Prot	NA	NA	Split	NA	Prot						
Protected Phases	2 4	2 4 5 6	5 6	1 7	1 7	1 7	1	2	4	5	6	7
Permitted Phases												
Detector Phase	2 4	2 4 5 6	5 6	1 7	1 7	1 7						
Switch Phase												
Minimum Initial (s)							1.0	25.0	5.0	1.0	12.0	9.0
Minimum Split (s)							7.0	31.0	11.0	8.0	22.0	15.0
Total Split (s)							8.0	69.0	14.0	8.0	36.0	15.0
Total Split (%)							5%	46%	9%	5%	24%	10%
Yellow Time (s)							4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)							2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag							Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode							None	C-Max	None	None	None	None
v/c Ratio	0.67	0.52	1.16	1.29	1.30	1.46						
Control Delay	9.6	2.8	137.6	215.7	216.2	251.6						
Queue Delay	0.9	1.3	0.4	0.0	0.0	0.0						
Total Delay	10.5	4.1	138.0	215.7	216.2	251.6						
Queue Length 50th (ft)	96	4	~635	~322	~326	~474						
Queue Length 95th (ft)	m131	m5	#724	#511	#341	#571						
Internal Link Dist (ft)		342	774		892							
Turn Bay Length (ft)												
Base Capacity (vph)	1762	2854	1278	190	192	315						
Starvation Cap Reductn	300	1074	0	0	0	0						
Spillback Cap Reductn	0	0	115	0	0	0						
Storage Cap Reductn	0	0	0	0	0	0						
Reduced v/c Ratio	0.81	0.83	1.27	1.29	1.30	1.46						

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

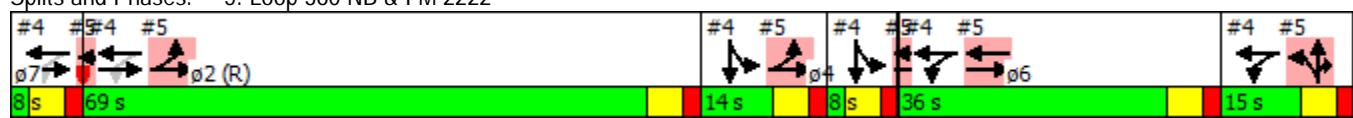
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Loop 360 NB & FM 2222





















HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

5: Loop 360 NB & FM 2222

Existing Conditions - AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1077	1407	0	0	1231	89	427	21	367	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.95	0.95	1.00			
Frt	1.00	1.00			0.99		1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00		0.95	0.96	1.00			
Satd. Flow (prot)	3433	3539			5021		1681	1695	1583			
Flt Permitted	0.95	1.00			1.00		0.95	0.96	1.00			
Satd. Flow (perm)	3433	3539			5021		1681	1695	1583			
Peak-hour factor, PHF	0.91	0.95	0.92	0.92	0.91	0.72	0.92	0.68	0.80	0.92	0.92	0.92
Adj. Flow (vph)	1184	1481	0	0	1353	124	464	31	459	0	0	0
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	136	0	0	0
Lane Group Flow (vph)	1184	1481	0	0	1470	0	246	249	323	0	0	0
Turn Type	Prot	NA			NA		Split	NA	Prot			
Protected Phases	2 4	2 4 5 6			5 6		1 7	1 7	1 7			
Permitted Phases												
Actuated Green, G (s)	77.0	121.0			38.0		17.0	17.0	17.0			
Effective Green, g (s)	77.0	121.0			38.0		17.0	17.0	17.0			
Actuated g/C Ratio	0.51	0.81			0.25		0.11	0.11	0.11			
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)	1762	2854			1271		190	192	179			
v/s Ratio Prot	c0.34	c0.42			c0.29		0.15	0.15	c0.20			
v/s Ratio Perm												
v/c Ratio	0.67	0.52			1.16		1.29	1.30	1.81			
Uniform Delay, d1	27.1	4.8			56.0		66.5	66.5	66.5			
Progression Factor	0.30	0.49			1.26		1.00	1.00	1.00			
Incremental Delay, d2	0.6	0.1			78.7		165.9	166.5	384.1			
Delay (s)	8.8	2.5			149.1		232.4	233.0	450.6			
Level of Service	A	A			F		F	F	F			
Approach Delay (s)		5.3			149.1			337.6			0.0	
Approach LOS		A			F			F			A	
Intersection Summary												
HCM 2000 Control Delay			109.2			HCM 2000 Level of Service			F			
HCM 2000 Volume to Capacity ratio			1.11									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)			36.0			
Intersection Capacity Utilization			88.0%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

Queues

Champions Tract #3 TIA

6: FM 2222 & Lakewood Dr

Existing Conditions - AM Peak



Lane Group	EBL	EBT	WBT	SBL
Lane Configurations				
Volume (vph)	69	1709	1136	9
Lane Group Flow (vph)	92	1762	1309	150
Turn Type	pm+pt	NA	NA	NA
Protected Phases	5	2	6	8
Permitted Phases	2			
Detector Phase	5	2	6	8
Switch Phase				
Minimum Initial (s)	5.0	25.0	25.0	5.0
Minimum Split (s)	12.0	32.0	32.0	22.0
Total Split (s)	20.0	125.0	105.0	25.0
Total Split (%)	13.3%	83.3%	70.0%	16.7%
Yellow Time (s)	5.0	5.0	5.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	6.0
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?	Yes		Yes	
Recall Mode	None	C-Min	C-Min	None
v/c Ratio	0.27	0.58	0.48	0.68
Control Delay	2.3	1.7	7.6	28.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	2.3	1.8	7.6	28.8
Queue Length 50th (ft)	5	83	206	13
Queue Length 95th (ft)	m8	m65	311	28
Internal Link Dist (ft)		774	667	639
Turn Bay Length (ft)	200			
Base Capacity (vph)	401	3034	2705	325
Starvation Cap Reductn	0	124	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.23	0.61	0.48	0.46

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

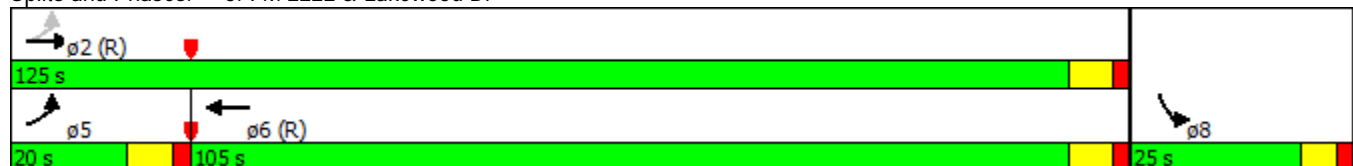
Offset: 48 (32%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: FM 2222 & Lakewood Dr

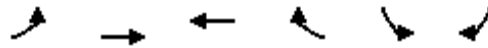


HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

6: FM 2222 & Lakewood Dr

Existing Conditions - AM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	69	1709	1136	8	9	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0		6.0	
Lane Util. Factor	1.00	0.95	0.95		1.00	
Frt	1.00	1.00	1.00		0.88	
Flt Protected	0.95	1.00	1.00		1.00	
Satd. Flow (prot)	1770	3539	3532		1626	
Flt Permitted	0.17	1.00	1.00		1.00	
Satd. Flow (perm)	322	3539	3532		1626	
Peak-hour factor, PHF	0.75	0.97	0.88	0.44	0.67	0.87
Adj. Flow (vph)	92	1762	1291	18	13	137
RTOR Reduction (vph)	0	0	0	0	129	0
Lane Group Flow (vph)	92	1762	1309	0	21	0
Turn Type	pm+pt	NA	NA		NA	
Protected Phases	5	2	6		8	
Permitted Phases	2					
Actuated Green, G (s)	128.6	128.6	114.9		8.4	
Effective Green, g (s)	128.6	128.6	114.9		8.4	
Actuated g/C Ratio	0.86	0.86	0.77		0.06	
Clearance Time (s)	7.0	7.0	7.0		6.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	340	3034	2705		91	
v/s Ratio Prot	0.01	c0.50	0.37		c0.01	
v/s Ratio Perm	0.22					
v/c Ratio	0.27	0.58	0.48		0.23	
Uniform Delay, d1	3.7	3.0	6.5		67.7	
Progression Factor	0.53	0.35	1.00		1.00	
Incremental Delay, d2	0.3	0.5	0.6		1.3	
Delay (s)	2.2	1.6	7.1		69.0	
Level of Service	A	A	A		E	
Approach Delay (s)		1.6	7.1		69.0	
Approach LOS		A	A		E	

Intersection Summary

HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection

Intersection Delay, s/veh 6.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	0	81	0	0	2939	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	74	92	92	96	59
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	109	0	0	3061	36

Major/Minor	Minor2	Major2
Conflicting Flow All	3079	1548
Stage 1	3079	-
Stage 2	0	-
Follow-up Headway	3.52	3.32
Pot Capacity-1 Maneuver	5	# 103
Stage 1	12	-
Stage 2	-	-
Time blocked-Platoon, %		-
Mov Capacity-1 Maneuver	5	# 103
Mov Capacity-2 Maneuver	5	-
Stage 1	12	-
Stage 2	-	-

Approach	EB	SB
HCM Control Delay, s	184.1	0
HCM LOS	F	

Minor Lane / Major Mvmt	EBLn1	SBT	SBR
Capacity (veh/h)	103	-	-
HCM Lane V/C Ratio	1.063	-	-
HCM Control Delay (s)	184.1	-	-
HCM Lane LOS	F		
HCM 95th %tile Q(veh)	6.823	-	-

Notes

~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Queues

Champions Tract #3 TIA

1: Jester Blvd & RM 2222

Existing Conditions - PM Peak



Lane Group	NBL	NBT	NBR	SBL	SBT	NEL	NET	SWL	SWT	SWR
Lane Configurations										
Volume (vph)	57	2366	241	65	1351	4	8	303	7	18
Lane Group Flow (vph)	70	2465	290	88	1536	12	40	186	188	36
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	5	2		1	6	7	4	3	8	
Permitted Phases	2		2	6		4	4	8		8
Detector Phase	5	2	2	1	6	7	4	3	8	8
Switch Phase										
Minimum Initial (s)	5.0	25.0	25.0	5.0	25.0	6.0	5.0	8.0	8.0	8.0
Minimum Split (s)	11.0	32.0	32.0	11.0	32.0	12.0	11.0	14.0	39.0	39.0
Total Split (s)	16.0	100.0	100.0	11.0	95.0	16.0	16.0	23.0	23.0	23.0
Total Split (%)	10.7%	66.7%	66.7%	7.3%	63.3%	10.7%	10.7%	15.3%	15.3%	15.3%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	7.0	7.0	6.0	7.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	None	None	None	None	None
v/c Ratio	0.34	1.09	0.27	0.65	0.66	0.14	0.38	0.78	0.79	0.11
Control Delay	8.3	66.6	7.1	46.3	19.3	70.8	43.6	83.0	83.9	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.3	66.6	7.1	46.3	19.3	70.8	43.6	83.0	83.9	0.7
Queue Length 50th (ft)	16	~1458	68	32	495	12	14	174	176	0
Queue Length 95th (ft)	m24	#1585	m94	#87	618	12	26	#322	#273	0
Internal Link Dist (ft)		362			394		655		292	
Turn Bay Length (ft)	215		180	225		150				
Base Capacity (vph)	236	2265	1055	136	2314	118	136	238	237	329
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	1.09	0.27	0.65	0.66	0.10	0.29	0.78	0.79	0.11

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Jester Blvd & RM 2222

























HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

1: Jester Blvd & RM 2222

Existing Conditions - PM Peak

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	57	2366	241	65	1351	10	4	8	12	303	7	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	7.0	7.0	6.0	7.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	0.95	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3533		1770	1681		1681	1689	1583
Flt Permitted	0.10	1.00	1.00	0.04	1.00		0.83	1.00		0.83	0.81	1.00
Satd. Flow (perm)	183	3539	1583	80	3533		1552	1681		1475	1439	1583
Peak-hour factor, PHF	0.81	0.96	0.83	0.74	0.89	0.56	0.33	0.58	0.46	0.83	0.75	0.50
Adj. Flow (vph)	70	2465	290	88	1518	18	12	14	26	365	9	36
RTOR Reduction (vph)	0	0	44	0	0	0	0	25	0	0	0	31
Lane Group Flow (vph)	70	2465	246	88	1536	0	12	15	0	186	188	5
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6			4	4		8		8
Actuated Green, G (s)	98.6	92.5	92.5	100.6	93.5		8.4	8.4		21.8	21.8	21.8
Effective Green, g (s)	98.6	92.5	92.5	100.6	93.5		8.4	8.4		21.8	21.8	21.8
Actuated g/C Ratio	0.66	0.62	0.62	0.67	0.62		0.06	0.06		0.15	0.15	0.15
Clearance Time (s)	6.0	7.0	7.0	6.0	7.0		6.0	6.0		6.0	6.0	6.0
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)	184	2182	976	133	2202		92	94		237	237	230
v/s Ratio Prot	0.02	c0.70		c0.03	0.43		0.00	c0.01		0.09	c0.09	
v/s Ratio Perm	0.23		0.16	0.41			0.00			0.03	0.03	0.00
v/c Ratio	0.38	1.13	0.25	0.66	0.70		0.13	0.16		0.78	0.79	0.02
Uniform Delay, d1	15.4	28.8	13.0	39.6	18.8		67.4	67.5		61.6	61.9	55.0
Progression Factor	0.99	0.81	0.94	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	61.1	0.2	11.7	1.9		0.6	0.8		15.6	16.5	0.0
Delay (s)	15.8	84.5	12.6	51.3	20.7		68.0	68.3		77.2	78.4	55.0
Level of Service	B	F	B	D	C		E	E		E	E	E
Approach Delay (s)		75.4			22.3			68.2			75.8	
Approach LOS		E			C			E			E	

Intersection Summary

HCM 2000 Control Delay	57.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Queues

Champions Tract #3 TIA

2: City Park Road & FM 2222

Existing Conditions - PM Peak



Lane Group	NBL	NBR	SET	NWL	NWT
Lane Configurations	↰↱	↰	↰↱	↰	↰↱
Volume (vph)	234	448	1835	235	2528
Lane Group Flow (vph)	272	614	2056	255	2661
Turn Type	NA	pt+ov	NA	pm+pt	NA
Protected Phases	4	4 5	6	5	2
Permitted Phases				2	
Detector Phase	4	4 5	6	5	2
Switch Phase					
Minimum Initial (s)	12.0		25.0	10.0	25.0
Minimum Split (s)	20.0		32.0	17.0	32.0
Total Split (s)	20.0		95.0	35.0	130.0
Total Split (%)	13.3%		63.3%	23.3%	86.7%
Yellow Time (s)	4.0		5.0	5.0	5.0
All-Red Time (s)	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0		7.0	7.0	7.0
Lead/Lag			Lead	Lag	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None		None	None	C-Max
v/c Ratio	0.85	1.17	1.00	0.67	0.92
Control Delay	90.3	139.4	41.2	58.7	24.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	90.3	139.4	41.2	58.7	24.9
Queue Length 50th (ft)	137	~708	1052	160	1000
Queue Length 95th (ft)	#196	#667	#1231	272	1078
Internal Link Dist (ft)	1125		1418		298
Turn Bay Length (ft)	500	500		215	
Base Capacity (vph)	320	524	2065	379	2901
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.85	1.17	1.00	0.67	0.92

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:NWTL, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 2: City Park Road & FM 2222



Kimley-Horn












Synchro 8 Report

HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

2: City Park Road & FM 2222

Existing Conditions - PM Peak

						
Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Volume (vph)	234	448	1835	52	235	2528
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	7.0		7.0	7.0
Lane Util. Factor	0.97	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	1583	3518		1770	3539
Flt Permitted	0.95	1.00	1.00		0.04	1.00
Satd. Flow (perm)	3433	1583	3518		78	3539
Peak-hour factor, PHF	0.86	0.73	0.93	0.63	0.92	0.95
Adj. Flow (vph)	272	614	1973	83	255	2661
RTOR Reduction (vph)	0	8	2	0	0	0
Lane Group Flow (vph)	272	606	2054	0	255	2661
Turn Type	NA	pt+ov	NA		pm+pt	NA
Protected Phases	4	4 5	6		5	2
Permitted Phases					2	
Actuated Green, G (s)	14.0	49.0	88.0		123.0	123.0
Effective Green, g (s)	14.0	42.0	88.0		123.0	123.0
Actuated g/C Ratio	0.09	0.28	0.59		0.82	0.82
Clearance Time (s)	6.0		7.0		7.0	7.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	320	443	2063		379	2901
v/s Ratio Prot	0.08	c0.38	c0.58		0.13	0.75
v/s Ratio Perm					0.42	
v/c Ratio	0.85	1.37	1.00		0.67	0.92
Uniform Delay, d1	67.0	54.0	30.8		51.0	9.8
Progression Factor	1.00	1.00	0.80		1.14	1.99
Incremental Delay, d2	18.6	179.6	16.3		3.2	4.3
Delay (s)	85.6	233.6	40.8		61.2	23.7
Level of Service	F	F	D		E	C
Approach Delay (s)	188.1		40.8			27.0
Approach LOS	F		D			C
Intersection Summary						
HCM 2000 Control Delay			56.2		HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio			1.12			
Actuated Cycle Length (s)			150.0		Sum of lost time (s)	20.0
Intersection Capacity Utilization			92.1%		ICU Level of Service	F
Analysis Period (min)			15			
c Critical Lane Group						

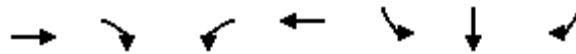
Intersection						
Intersection Delay, s/veh	2.5					
Movement	SEL	SET	NWT	NWR	SWL	SWR
Vol, veh/h	28	2127	2900	59	6	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	78	89	96	75	63	48
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	36	2390	3021	79	10	44
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	3100	0	-	0	4327	1550
Stage 1	-	-	-	-	3060	-
Stage 2	-	-	-	-	1267	-
Follow-up Headway	2.22	-	-	-	3.52	3.32
Pot Capacity-1 Maneuver	103	-	-	-	# 1	103
Stage 1	-	-	-	-	23	-
Stage 2	-	-	-	-	228	-
Time blocked-Platoon, %		-	-	-		
Mov Capacity-1 Maneuver	103	-	-	-	# 1	103
Mov Capacity-2 Maneuver	-	-	-	-	18	-
Stage 1	-	-	-	-	23	-
Stage 2	-	-	-	-	148	-
Approach	SE		NW		SW	
HCM Control Delay, s	0.9		0		224.6	
HCM LOS					F	
Minor Lane / Major Mvmt		NWT	NWR	SEL	SET	SWLn1
Capacity (veh/h)		-	-	103	-	56
HCM Lane V/C Ratio		-	-	0.349	-	0.951
HCM Control Delay (s)		-	-	57.588	-	224.6
HCM Lane LOS				F		F
HCM 95th %tile Q(veh)		-	-	1.378	-	4.302
Notes						
~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined						

Queues

Champions Tract #3 TIA

4: Loop 360 SB & FM 2222

Existing Conditions - PM Peak



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR	ø1	ø2	ø4	ø5	ø6
Lane Configurations	↑↑↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑					
Volume (vph)	1605	528	384	2045	110	1	1029					
Lane Group Flow (vph)	1689	621	447	2087	64	64	1131					
Turn Type	NA	Free	pm+pt	NA	Split	NA	Free					
Protected Phases	1 2		6 7	1 2 6 7	4 5	4 5		1	2	4	5	6
Permitted Phases		Free	1 2 6 7				Free					
Detector Phase	1 2		6 7	1 2 6 7	4 5	4 5						
Switch Phase												
Minimum Initial (s)								1.0	25.0	5.0	1.0	12.0
Minimum Split (s)								7.0	31.0	11.0	8.0	22.0
Total Split (s)								8.0	35.0	14.0	8.0	57.0
Total Split (%)								5%	23%	9%	5%	38%
Yellow Time (s)								4.0	4.0	4.0	4.0	4.0
All-Red Time (s)								2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag								Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?								Yes	Yes	Yes	Yes	Yes
Recall Mode								None	C-Max	None	None	None
v/c Ratio	1.07	0.39	0.46	0.73	0.36	0.36	0.71					
Control Delay	93.0	0.1	3.8	4.7	68.4	68.3	2.8					
Queue Delay	13.1	0.0	2.1	47.5	0.0	0.0	0.0					
Total Delay	106.0	0.1	5.9	52.2	68.4	68.3	2.8					
Queue Length 50th (ft)	~535	0	45	816	62	62	0					
Queue Length 95th (ft)	m#504	m0	m44	m0	114	30	0					
Internal Link Dist (ft)	712			342		1059						
Turn Bay Length (ft)												
Base Capacity (vph)	1580	1583	981	2878	179	180	1583					
Starvation Cap Reductn	0	0	382	1029	0	0	0					
Spillback Cap Reductn	115	0	0	0	0	0	0					
Storage Cap Reductn	0	0	0	0	0	0	0					
Reduced v/c Ratio	1.15	0.39	0.75	1.13	0.36	0.36	0.71					

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

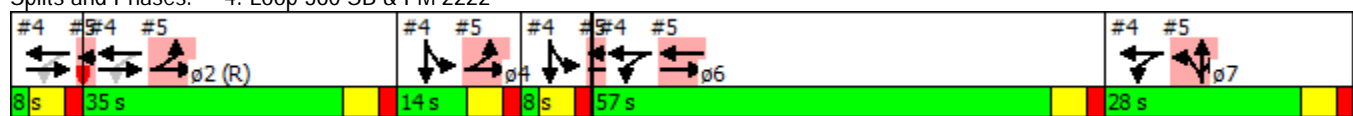
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Loop 360 SB & FM 2222



HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

4: Loop 360 SB & FM 2222

Existing Conditions - PM Peak



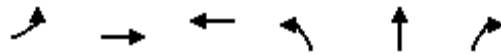
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↗	↖	↑↑					↖	↗	↗
Volume (vph)	0	1605	528	384	2045	0	0	0	0	110	1	1029
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0	6.0	4.0
Lane Util. Factor		0.86	1.00	1.00	0.95					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.96	1.00
Satd. Flow (prot)		6408	1583	1770	3539					1681	1690	1583
Flt Permitted		1.00	1.00	0.11	1.00					0.95	0.96	1.00
Satd. Flow (perm)		6408	1583	201	3539					1681	1690	1583
Peak-hour factor, PHF	0.92	0.95	0.85	0.86	0.98	0.92	0.92	0.92	0.92	0.89	0.25	0.91
Adj. Flow (vph)	0	1689	621	447	2087	0	0	0	0	124	4	1131
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1689	621	447	2087	0	0	0	0	64	64	1131
Turn Type		NA	Free	pm+pt	NA					Split	NA	Free
Protected Phases		1 2		6 7	1 2 6 7					4 5	4 5	
Permitted Phases			Free	1 2 6 7								Free
Actuated Green, G (s)		37.0	150.0	116.0	122.0					16.0	16.0	150.0
Effective Green, g (s)		37.0	150.0	116.0	122.0					16.0	16.0	150.0
Actuated g/C Ratio		0.25	1.00	0.77	0.81					0.11	0.11	1.00
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)		1580	1583	981	2878					179	180	1583
v/s Ratio Prot		c0.26		0.24	c0.59					0.04	0.04	
v/s Ratio Perm			0.39	0.11								c0.71
v/c Ratio		1.07	0.39	0.46	0.73					0.36	0.36	0.71
Uniform Delay, d1		56.5	0.0	16.1	6.4					62.2	62.2	0.0
Progression Factor		1.16	1.00	0.24	0.69					1.00	1.00	1.00
Incremental Delay, d2		32.6	0.1	0.0	0.1					1.2	1.2	2.8
Delay (s)		97.9	0.1	3.9	4.5					63.5	63.4	2.8
Level of Service		F	A	A	A					E	E	A
Approach Delay (s)		71.6			4.4			0.0			9.0	
Approach LOS		E			A			A			A	
Intersection Summary												
HCM 2000 Control Delay			30.8			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			1.02									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)				36.0		
Intersection Capacity Utilization			107.5%			ICU Level of Service				G		
Analysis Period (min)			15									
c Critical Lane Group												

Queues

Champions Tract #3 TIA

5: Loop 360 NB & FM 2222

Existing Conditions - PM Peak



Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	ø1	ø2	ø4	ø5	ø6	ø7
Lane Configurations	↔↔	↑↑	↑↑↑	↔	↔	↔						
Volume (vph)	738	971	1770	663	40	546						
Lane Group Flow (vph)	811	1044	1927	389	385	674						
Turn Type	Prot	NA	NA	Split	NA	Prot						
Protected Phases	2 4	2 4 5 6	5 6	1 7	1 7	1 7	1	2	4	5	6	7
Permitted Phases												
Detector Phase	2 4	2 4 5 6	5 6	1 7	1 7	1 7						
Switch Phase												
Minimum Initial (s)							1.0	25.0	5.0	1.0	12.0	9.0
Minimum Split (s)							7.0	31.0	11.0	8.0	22.0	15.0
Total Split (s)							8.0	35.0	14.0	8.0	57.0	28.0
Total Split (%)							5%	23%	9%	5%	38%	19%
Yellow Time (s)							4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)							2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag							Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode							None	C-Max	None	None	None	None
v/c Ratio	0.82	0.41	0.97	1.16	1.14	1.51						
Control Delay	10.0	4.3	44.7	150.6	143.3	271.6						
Queue Delay	21.8	39.9	12.5	0.0	0.0	0.1						
Total Delay	31.8	44.2	57.1	150.6	143.3	271.7						
Queue Length 50th (ft)	27	3	510	~471	~460	~786						
Queue Length 95th (ft)	m29	m3	#773	#693	#506	#870						
Internal Link Dist (ft)		342	774		892							
Turn Bay Length (ft)												
Base Capacity (vph)	984	2548	1988	336	339	446						
Starvation Cap Reductn	193	1576	0	0	0	0						
Spillback Cap Reductn	0	129	108	0	0	5						
Storage Cap Reductn	0	0	0	0	0	0						
Reduced v/c Ratio	1.03	1.07	1.02	1.16	1.14	1.53						

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

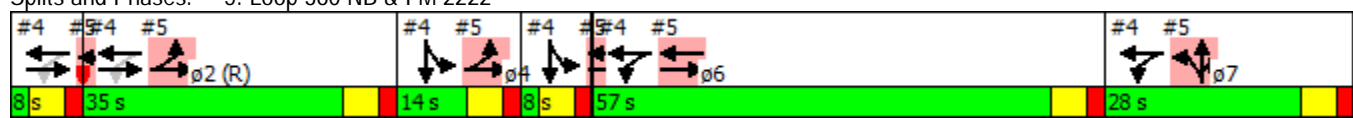
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Loop 360 NB & FM 2222





















HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

5: Loop 360 NB & FM 2222

Existing Conditions - PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	738	971	0	0	1770	54	663	40	546	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.95	0.95	1.00			
Frt	1.00	1.00			0.99		1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00		0.95	0.96	1.00			
Satd. Flow (prot)	3433	3539			5045		1681	1696	1583			
Flt Permitted	0.95	1.00			1.00		0.95	0.96	1.00			
Satd. Flow (perm)	3433	3539			5045		1681	1696	1583			
Peak-hour factor, PHF	0.91	0.93	0.92	0.92	0.97	0.53	0.92	0.75	0.81	0.92	0.92	0.92
Adj. Flow (vph)	811	1044	0	0	1825	102	721	53	674	0	0	0
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	130	0	0	0
Lane Group Flow (vph)	811	1044	0	0	1923	0	389	385	544	0	0	0
Turn Type	Prot	NA			NA		Split	NA	Prot			
Protected Phases	2 4	2 4 5 6			5 6		1 7	1 7	1 7			
Permitted Phases												
Actuated Green, G (s)	43.0	108.0			59.0		30.0	30.0	30.0			
Effective Green, g (s)	43.0	108.0			59.0		30.0	30.0	30.0			
Actuated g/C Ratio	0.29	0.72			0.39		0.20	0.20	0.20			
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)	984	2548			1984		336	339	316			
v/s Ratio Prot	c0.24	0.29			c0.38		0.23	0.23	c0.34			
v/s Ratio Perm												
v/c Ratio	0.82	0.41			0.97		1.16	1.14	1.72			
Uniform Delay, d1	50.0	8.3			44.6		60.0	60.0	60.0			
Progression Factor	0.16	0.49			0.79		1.00	1.00	1.00			
Incremental Delay, d2	1.4	0.0			8.9		99.1	90.9	338.3			
Delay (s)	9.3	4.1			44.1		159.1	150.9	398.3			
Level of Service	A	A			D		F	F	F			
Approach Delay (s)		6.4			44.1			268.3			0.0	
Approach LOS		A			D			F			A	
Intersection Summary												
HCM 2000 Control Delay			92.8			HCM 2000 Level of Service			F			
HCM 2000 Volume to Capacity ratio			1.26									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)			36.0			
Intersection Capacity Utilization			107.5%			ICU Level of Service			G			
Analysis Period (min)			15									
c Critical Lane Group												

Queues

Champions Tract #3 TIA

6: FM 2222 & Lakewood Dr

Existing Conditions - PM Peak



Lane Group	EBL	EBT	WBT	SBL
Lane Configurations				
Volume (vph)	208	1431	1627	20
Lane Group Flow (vph)	274	1590	1854	180
Turn Type	pm+pt	NA	NA	NA
Protected Phases	5	2	6	8
Permitted Phases	2			
Detector Phase	5	2	6	8
Switch Phase				
Minimum Initial (s)	5.0	25.0	25.0	5.0
Minimum Split (s)	12.0	32.0	32.0	22.0
Total Split (s)	25.0	125.0	100.0	25.0
Total Split (%)	16.7%	83.3%	66.7%	16.7%
Yellow Time (s)	5.0	5.0	5.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	6.0
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?	Yes		Yes	
Recall Mode	None	C-Min	C-Min	None
v/c Ratio	0.79	0.53	0.84	0.75
Control Delay	52.1	9.3	26.9	39.0
Queue Delay	0.0	0.2	0.0	0.0
Total Delay	52.1	9.5	26.9	39.0
Queue Length 50th (ft)	140	687	752	46
Queue Length 95th (ft)	m192	m632	841	47
Internal Link Dist (ft)		774	667	639
Turn Bay Length (ft)	200			
Base Capacity (vph)	349	2976	2213	322
Starvation Cap Reductn	0	532	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.79	0.65	0.84	0.56

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

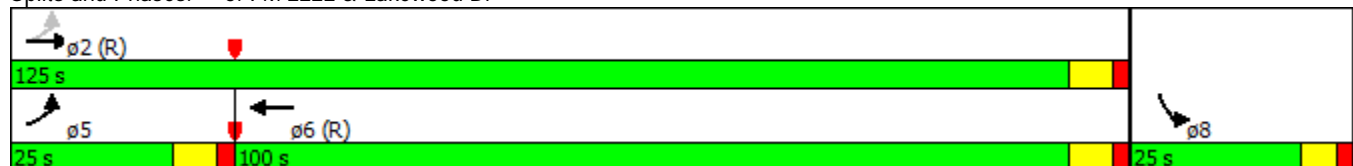
Offset: 48 (32%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: FM 2222 & Lakewood Dr

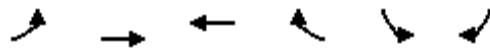


HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

6: FM 2222 & Lakewood Dr

Existing Conditions - PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	208	1431	1627	56	20	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0		6.0	
Lane Util. Factor	1.00	0.95	0.95		1.00	
Frt	1.00	1.00	0.99		0.89	
Flt Protected	0.95	1.00	1.00		0.99	
Satd. Flow (prot)	1770	3539	3520		1640	
Flt Permitted	0.04	1.00	1.00		0.99	
Satd. Flow (perm)	77	3539	3520		1640	
Peak-hour factor, PHF	0.76	0.90	0.91	0.85	0.64	0.87
Adj. Flow (vph)	274	1590	1788	66	31	149
RTOR Reduction (vph)	0	0	2	0	122	0
Lane Group Flow (vph)	274	1590	1852	0	58	0
Turn Type	pm+pt	NA	NA		NA	
Protected Phases	5	2	6		8	
Permitted Phases	2					
Actuated Green, G (s)	126.2	126.2	93.9		10.8	
Effective Green, g (s)	126.2	126.2	93.9		10.8	
Actuated g/C Ratio	0.84	0.84	0.63		0.07	
Clearance Time (s)	7.0	7.0	7.0		6.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	350	2977	2203		118	
v/s Ratio Prot	c0.13	0.45	c0.53		c0.04	
v/s Ratio Perm	0.53					
v/c Ratio	0.78	0.53	0.84		0.49	
Uniform Delay, d1	49.8	3.4	22.1		66.9	
Progression Factor	0.95	2.27	1.00		1.00	
Incremental Delay, d2	6.9	0.4	4.1		3.1	
Delay (s)	53.9	8.2	26.2		70.1	
Level of Service	D	A	C		E	
Approach Delay (s)		14.9	26.2		70.1	
Approach LOS		B	C		E	

Intersection Summary

HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	84.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection						
Intersection Delay, s/veh	1.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	0	36	0	0	2556	68
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	63	92	92	94	67
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	57	0	0	2719	101
Major/Minor	Minor2			Major2		
Conflicting Flow All	2770	1409			-	0
Stage 1	2770	-			-	-
Stage 2	0	-			-	-
Follow-up Headway	3.52	3.32			-	-
Pot Capacity-1 Maneuver	9	128			-	-
Stage 1	19	-			-	-
Stage 2	-	-			-	-
Time blocked-Platoon, %					-	-
Mov Capacity-1 Maneuver	9	128			-	-
Mov Capacity-2 Maneuver	9	-			-	-
Stage 1	19	-			-	-
Stage 2	-	-			-	-
Approach	EB			SB		
HCM Control Delay, s	54				0	
HCM LOS	F					
Minor Lane / Major Mvmt	EBLn1	SBT	SBR			
Capacity (veh/h)	128	-	-			
HCM Lane V/C Ratio	0.446	-	-			
HCM Control Delay (s)	54	-	-			
HCM Lane LOS	F					
HCM 95th %tile Q(veh)	1.978	-	-			
Notes						
~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined						

Appendix E: Synchro Reports – 2016 No-Build Existing Condition

Queues

1: Jester Blvd & RM 2222

Champions Tract #3 TIA

2016 No Build Conditions - AM Peak



Lane Group	NBL	NBT	NBR	SBL	SBT	NEL	NET	SWL	SWT	SWR
Lane Configurations										
Volume (vph)	7	1299	100	41	2805	6	2	186	1	7
Lane Group Flow (vph)	9	1397	147	68	2988	14	120	121	121	18
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	5	2		1	6	7	4	3	8	
Permitted Phases	2		2	6		4	4	8		8
Detector Phase	5	2	2	1	6	7	4	3	8	8
Switch Phase										
Minimum Initial (s)	5.0	25.0	25.0	5.0	25.0	5.0	5.0	8.0	8.0	8.0
Minimum Split (s)	11.0	32.0	32.0	11.0	32.0	11.0	11.0	14.0	39.0	39.0
Total Split (s)	15.0	99.0	99.0	11.0	95.0	16.0	16.0	24.0	24.0	24.0
Total Split (%)	10.0%	66.0%	66.0%	7.3%	63.3%	10.7%	10.7%	16.0%	16.0%	16.0%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	7.0	7.0	6.0	7.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	None	None	None	None	None
v/c Ratio	0.08	0.61	0.14	0.32	1.22	0.12	0.76	0.56	0.56	0.05
Control Delay	5.1	6.2	1.1	11.0	125.5	68.2	63.4	68.9	68.9	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.1	6.2	1.1	11.0	125.5	68.2	63.4	68.9	68.9	0.3
Queue Length 50th (ft)	1	102	0	20	~1887	13	55	105	105	0
Queue Length 95th (ft)	m3	178	4	23	#2151	17	40	167	50	0
Internal Link Dist (ft)		362			394		655		292	
Turn Bay Length (ft)	215		180	225		150				
Base Capacity (vph)	157	2296	1066	215	2456	139	167	233	216	351
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.61	0.14	0.32	1.22	0.10	0.72	0.52	0.56	0.05

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Jester Blvd & RM 2222

























HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

1: Jester Blvd & RM 2222

2016 No Build Conditions - AM Peak

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	7	1299	100	41	2805	1	6	2	93	186	1	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	7.0	7.0	6.0	7.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	0.95	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539		1770	1593		1681	1688	1583
Flt Permitted	0.04	1.00	1.00	0.12	1.00		0.68	1.00		0.45	0.44	1.00
Satd. Flow (perm)	80	3539	1583	224	3539		1258	1593		795	782	1583
Peak-hour factor, PHF	0.75	0.93	0.68	0.60	0.94	0.25	0.42	0.50	0.80	0.78	0.25	0.38
Adj. Flow (vph)	9	1397	147	68	2984	4	14	4	116	238	4	18
RTOR Reduction (vph)	0	0	42	0	0	0	0	57	0	0	0	15
Lane Group Flow (vph)	9	1397	105	68	2988	0	14	63	0	121	121	3
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6			4	4		8		8
Actuated Green, G (s)	93.8	92.6	92.6	100.2	95.8		12.9	12.9		24.0	24.0	24.0
Effective Green, g (s)	93.8	92.6	92.6	100.2	95.8		12.9	12.9		24.0	24.0	24.0
Actuated g/C Ratio	0.63	0.62	0.62	0.67	0.64		0.09	0.09		0.16	0.16	0.16
Clearance Time (s)	6.0	7.0	7.0	6.0	7.0		6.0	6.0		6.0	6.0	6.0
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)	63	2184	977	194	2260		121	136		216	216	253
v/s Ratio Prot	0.00	0.39		c0.01	c0.84		0.00	c0.04		c0.06	0.06	
v/s Ratio Perm	0.09		0.07	0.22			0.01			0.03	c0.03	0.00
v/c Ratio	0.14	0.64	0.11	0.35	1.32		0.12	0.47		0.56	0.56	0.01
Uniform Delay, d1	36.9	18.1	11.8	13.9	27.1		63.4	65.3		57.1	58.1	53.0
Progression Factor	0.57	0.32	0.23	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.8	1.1	0.2	1.1	148.2		0.4	2.5		3.3	3.3	0.0
Delay (s)	21.8	6.9	2.9	15.0	175.3		63.8	67.8		60.4	61.4	53.0
Level of Service	C	A	A	B	F		E	E		E	E	D
Approach Delay (s)		6.6			171.7			67.4			60.4	
Approach LOS		A			F			E			E	

Intersection Summary

HCM 2000 Control Delay	111.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	100.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Queues

2: City Park Road & FM 2222

Champions Tract #3 TIA

2016 No Build Conditions - AM Peak



Lane Group	NBL	NBR	SET	NWL	NWT
Lane Configurations	←←	→	←→	←	→→
Volume (vph)	41	350	2893	208	1570
Lane Group Flow (vph)	51	389	3350	263	1670
Turn Type	NA	pt+ov	NA	pm+pt	NA
Protected Phases	4	4 5	6	5	2
Permitted Phases				2	
Detector Phase	4	4 5	6	5	2
Switch Phase					
Minimum Initial (s)	12.0		20.0	5.0	20.0
Minimum Split (s)	20.0		29.0	14.0	29.0
Total Split (s)	32.0		93.0	25.0	118.0
Total Split (%)	21.3%		62.0%	16.7%	78.7%
Yellow Time (s)	4.0		5.0	5.0	5.0
All-Red Time (s)	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0		7.0	7.0	7.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None		None	None	C-Max
v/c Ratio	0.09	0.72	1.67	1.00	0.64
Control Delay	52.6	52.2	323.2	91.9	20.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	52.6	52.2	323.2	91.9	20.2
Queue Length 50th (ft)	21	332	~2525	~195	790
Queue Length 95th (ft)	38	461	m#1955	#310	865
Internal Link Dist (ft)	1125		1418		298
Turn Bay Length (ft)	500	500		215	
Base Capacity (vph)	595	527	2004	264	2621
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.09	0.74	1.67	1.00	0.64

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:NWTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.












Splits and Phases: 2: City Park Road & FM 2222



HCM Signalized Intersection Capacity Analysis

2: City Park Road & FM 2222

Champions Tract #3 TIA
2016 No Build Conditions - AM Peak

						
Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Volume (vph)	41	350	2893	272	208	1570
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	7.0		7.0	7.0
Lane Util. Factor	0.97	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	1583	3486		1770	3539
Flt Permitted	0.95	1.00	1.00		0.04	1.00
Satd. Flow (perm)	3433	1583	3486		80	3539
Peak-hour factor, PHF	0.81	0.90	0.96	0.81	0.79	0.94
Adj. Flow (vph)	51	389	3014	336	263	1670
RTOR Reduction (vph)	0	1	6	0	0	0
Lane Group Flow (vph)	51	388	3344	0	263	1670
Turn Type	NA	pt+ov	NA		pm+pt	NA
Protected Phases	4	4 5	6		5	2
Permitted Phases					2	
Actuated Green, G (s)	25.9	50.0	86.0		111.1	111.1
Effective Green, g (s)	25.9	50.0	86.0		111.1	111.1
Actuated g/C Ratio	0.17	0.33	0.57		0.74	0.74
Clearance Time (s)	6.0		7.0		7.0	7.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	592	527	1998		263	2621
v/s Ratio Prot	0.01	c0.25	c0.96		c0.12	0.47
v/s Ratio Perm					0.62	
v/c Ratio	0.09	0.74	1.67		1.00	0.64
Uniform Delay, d1	52.1	44.2	32.0		56.5	9.6
Progression Factor	1.00	1.00	0.55		0.82	1.96
Incremental Delay, d2	0.1	5.3	303.5		52.7	1.1
Delay (s)	52.2	49.5	321.1		99.2	19.8
Level of Service	D	D	F		F	B
Approach Delay (s)	49.8		321.1			30.6
Approach LOS	D		F			C
Intersection Summary						
HCM 2000 Control Delay			202.2		HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio			1.41			
Actuated Cycle Length (s)			150.0		Sum of lost time (s)	20.0
Intersection Capacity Utilization			126.8%		ICU Level of Service	H
Analysis Period (min)			15			
c Critical Lane Group						

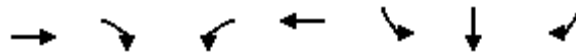
Intersection						
Intersection Delay, s/veh	31.7					
Movement	SEL	SET	NWT	NWR	SWL	SWR
Vol, veh/h	55	3130	1813	175	78	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	44	95	93	63	87	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	125	3295	1949	278	90	45
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	2227	0	-	0	3985	1114
Stage 1	-	-	-	-	2088	-
Stage 2	-	-	-	-	1897	-
Follow-up Headway	2.22	-	-	-	3.52	3.32
Pot Capacity-1 Maneuver	230	-	-	-	# 2	203
Stage 1	-	-	-	-	# 81	-
Stage 2	-	-	-	-	104	-
Time blocked-Platoon, %		-	-	-		
Mov Capacity-1 Maneuver	230	-	-	-	# 1	203
Mov Capacity-2 Maneuver	-	-	-	-	# 28	-
Stage 1	-	-	-	-	# 81	-
Stage 2	-	-	-	-	# 47	-
Approach	SE		NW		SW	
HCM Control Delay, s	1.4		0		\$ 1321.2	
HCM LOS					F	
Minor Lane / Major Mvmt	NWT	NWR	SEL	SET	SWLn1	
Capacity (veh/h)	-	-	230	-	39	
HCM Lane V/C Ratio	-	-	0.543	-	3.459	
HCM Control Delay (s)	-	-	37.847	-	\$ 1321.2	
HCM Lane LOS			E		F	
HCM 95th %tile Q(veh)	-	-	2.921	-	15.294	
Notes						
~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined						

Queues

4: Loop 360 SB & FM 2222

Champions Tract #3 TIA

2016 No Build Conditions - AM Peak



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR	ø1	ø2	ø4	ø5	ø6
Lane Configurations	↑↑↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑					
Volume (vph)	2395	724	595	1278	220	108	642					
Lane Group Flow (vph)	2444	762	620	1452	190	198	705					
Turn Type	NA	Free	pm+pt	NA	Split	NA	Free					
Protected Phases	1 2		6 7	1 2 6 7	4 5	4 5		1	2	4	5	6
Permitted Phases		Free	1 2 6 7				Free					
Detector Phase	1 2		6 7	1 2 6 7	4 5	4 5						
Switch Phase												
Minimum Initial (s)								1.0	25.0	5.0	1.0	12.0
Minimum Split (s)								7.0	31.0	11.0	8.0	22.0
Total Split (s)								8.0	69.0	14.0	8.0	36.0
Total Split (%)								5%	46%	9%	5%	24%
Yellow Time (s)								4.0	4.0	4.0	4.0	4.0
All-Red Time (s)								2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag								Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?								Yes	Yes	Yes	Yes	Yes
Recall Mode								None	C-Max	None	None	None
v/c Ratio	0.81	0.48	1.07	0.50	1.06	1.07	0.45					
Control Delay	55.0	0.1	60.1	4.9	146.0	147.1	0.9					
Queue Delay	0.1	0.0	0.0	49.7	0.0	0.0	0.0					
Total Delay	55.1	0.1	60.1	54.6	146.0	147.1	0.9					
Queue Length 50th (ft)	705	0	~611	573	~214	~224	0					
Queue Length 95th (ft)	m433	m0	m107	m1	#368	#333	0					
Internal Link Dist (ft)	712			342		1059						
Turn Bay Length (ft)												
Base Capacity (vph)	3033	1583	580	2878	179	185	1583					
Starvation Cap Reductn	0	0	0	1790	0	0	0					
Spillback Cap Reductn	79	0	0	0	0	0	0					
Storage Cap Reductn	0	0	0	0	0	0	0					
Reduced v/c Ratio	0.83	0.48	1.07	1.33	1.06	1.07	0.45					

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

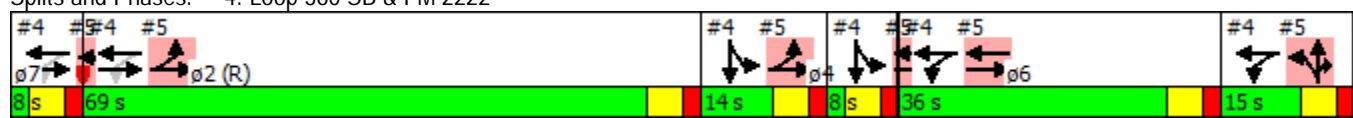
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Loop 360 SB & FM 2222















HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

4: Loop 360 SB & FM 2222

2016 No Build Conditions - AM Peak

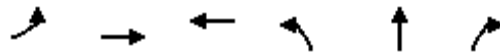
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↗	↖	↑↑					↖	↗	↗
Volume (vph)	0	2395	724	595	1278	0	0	0	0	220	108	642
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0	6.0	4.0
Lane Util. Factor		0.86	1.00	1.00	0.95					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.98	1.00
Satd. Flow (prot)		6408	1583	1770	3539					1681	1742	1583
Flt Permitted		1.00	1.00	0.06	1.00					0.95	0.98	1.00
Satd. Flow (perm)		6408	1583	105	3539					1681	1742	1583
Peak-hour factor, PHF	0.92	0.98	0.95	0.96	0.88	0.92	0.92	0.92	0.92	0.87	0.80	0.91
Adj. Flow (vph)	0	2444	762	620	1452	0	0	0	0	253	135	705
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2444	762	620	1452	0	0	0	0	190	198	705
Turn Type		NA	Free	pm+pt	NA					Split	NA	Free
Protected Phases		1 2		6 7	1 2 6 7					4 5	4 5	
Permitted Phases			Free	1 2 6 7								Free
Actuated Green, G (s)		71.0	150.0	116.0	122.0					16.0	16.0	150.0
Effective Green, g (s)		71.0	150.0	116.0	122.0					16.0	16.0	150.0
Actuated g/C Ratio		0.47	1.00	0.77	0.81					0.11	0.11	1.00
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)		3033	1583	580	2878					179	185	1583
v/s Ratio Prot		0.38		c0.32	0.41					0.11	c0.11	
v/s Ratio Perm			0.48	c0.51								0.45
v/c Ratio		0.81	0.48	1.07	0.50					1.06	1.07	0.45
Uniform Delay, d1		33.6	0.0	46.5	4.4					67.0	67.0	0.0
Progression Factor		1.62	1.00	0.52	1.08					1.00	1.00	1.00
Incremental Delay, d2		0.2	0.1	34.9	0.0					84.5	86.1	0.9
Delay (s)		54.5	0.1	59.0	4.8					151.5	153.1	0.9
Level of Service		D	A	E	A					F	F	A
Approach Delay (s)		41.6			21.0			0.0			54.7	
Approach LOS		D			C			A			D	
Intersection Summary												
HCM 2000 Control Delay			37.1			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			1.24									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)				36.0		
Intersection Capacity Utilization			91.6%			ICU Level of Service				F		
Analysis Period (min)			15									
c Critical Lane Group												

Queues

5: Loop 360 NB & FM 2222

Champions Tract #3 TIA

2016 No Build Conditions - AM Peak



Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	ø1	ø2	ø4	ø5	ø6	ø7
Lane Configurations	↔↔	↑↑	↑↑↑	↔	↔	↔						
Volume (vph)	1135	1475	1360	523	22	382						
Lane Group Flow (vph)	1247	1553	1624	301	299	478						
Turn Type	Prot	NA	NA	Split	NA	Prot						
Protected Phases	2 4	2 4 5 6	5 6	1 7	1 7	1 7	1	2	4	5	6	7
Permitted Phases												
Detector Phase	2 4	2 4 5 6	5 6	1 7	1 7	1 7						
Switch Phase												
Minimum Initial (s)							1.0	25.0	5.0	1.0	12.0	9.0
Minimum Split (s)							7.0	31.0	11.0	8.0	22.0	15.0
Total Split (s)							8.0	69.0	14.0	8.0	36.0	15.0
Total Split (%)							5%	46%	9%	5%	24%	10%
Yellow Time (s)							4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)							2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag							Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode							None	C-Max	None	None	None	None
v/c Ratio	0.71	0.54	1.27	1.58	1.57	1.52						
Control Delay	10.3	2.8	178.9	326.9	319.3	276.9						
Queue Delay	1.3	1.8	0.5	0.0	0.0	0.0						
Total Delay	11.6	4.6	179.4	326.9	319.3	276.9						
Queue Length 50th (ft)	138	4	~747	~438	~433	~513						
Queue Length 95th (ft)	m158	m5	#847	#644	#431	#606						
Internal Link Dist (ft)		342	774		892							
Turn Bay Length (ft)												
Base Capacity (vph)	1762	2854	1279	190	191	315						
Starvation Cap Reductn	298	1073	0	0	0	0						
Spillback Cap Reductn	0	0	144	0	0	0						
Storage Cap Reductn	0	0	0	0	0	0						
Reduced v/c Ratio	0.85	0.87	1.43	1.58	1.57	1.52						

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

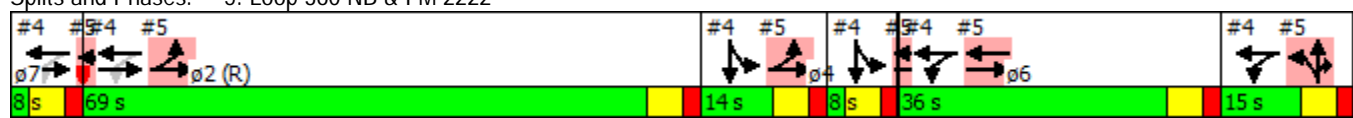
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.




















Splits and Phases: 5: Loop 360 NB & FM 2222



HCM Signalized Intersection Capacity Analysis

5: Loop 360 NB & FM 2222

Champions Tract #3 TIA
2016 No Build Conditions - AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1135	1475	0	0	1360	93	523	22	382	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.95	0.95	1.00			
Frt	1.00	1.00			0.99		1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00		0.95	0.96	1.00			
Satd. Flow (prot)	3433	3539			5025		1681	1694	1583			
Flt Permitted	0.95	1.00			1.00		0.95	0.96	1.00			
Satd. Flow (perm)	3433	3539			5025		1681	1694	1583			
Peak-hour factor, PHF	0.91	0.95	0.92	0.92	0.91	0.72	0.92	0.68	0.80	0.92	0.92	0.92
Adj. Flow (vph)	1247	1553	0	0	1495	129	568	32	478	0	0	0
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	136	0	0	0
Lane Group Flow (vph)	1247	1553	0	0	1617	0	301	299	342	0	0	0
Turn Type	Prot	NA			NA		Split	NA	Prot			
Protected Phases	2 4	2 4 5 6			5 6		1 7	1 7	1 7			
Permitted Phases												
Actuated Green, G (s)	77.0	121.0			38.0		17.0	17.0	17.0			
Effective Green, g (s)	77.0	121.0			38.0		17.0	17.0	17.0			
Actuated g/C Ratio	0.51	0.81			0.25		0.11	0.11	0.11			
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)	1762	2854			1273		190	191	179			
v/s Ratio Prot	c0.36	c0.44			c0.32		0.18	0.18	c0.22			
v/s Ratio Perm												
v/c Ratio	0.71	0.54			1.27		1.58	1.57	1.91			
Uniform Delay, d1	27.9	5.0			56.0		66.5	66.5	66.5			
Progression Factor	0.31	0.48			1.22		1.00	1.00	1.00			
Incremental Delay, d2	0.8	0.1			127.2		286.5	278.3	430.7			
Delay (s)	9.5	2.5			195.4		353.0	344.8	497.2			
Level of Service	A	A			F		F	F	F			
Approach Delay (s)		5.6			195.4			414.7			0.0	
Approach LOS		A			F			F			A	
Intersection Summary												
HCM 2000 Control Delay		141.8			HCM 2000 Level of Service			F				
HCM 2000 Volume to Capacity ratio		1.19										
Actuated Cycle Length (s)		150.0			Sum of lost time (s)			36.0				
Intersection Capacity Utilization		91.6%			ICU Level of Service			F				
Analysis Period (min)		15										
c Critical Lane Group												

Queues

6: FM 2222 & Lakewood Dr

Champions Tract #3 TIA

2016 No Build Conditions - AM Peak



Lane Group	EBL	EBT	WBT	SBL
Lane Configurations				
Volume (vph)	72	1789	1261	9
Lane Group Flow (vph)	96	1844	1451	156
Turn Type	pm+pt	NA	NA	NA
Protected Phases	5	2	6	8
Permitted Phases	2			
Detector Phase	5	2	6	8
Switch Phase				
Minimum Initial (s)	5.0	25.0	25.0	5.0
Minimum Split (s)	12.0	32.0	32.0	22.0
Total Split (s)	20.0	125.0	105.0	25.0
Total Split (%)	13.3%	83.3%	70.0%	16.7%
Yellow Time (s)	5.0	5.0	5.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	6.0
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?	Yes		Yes	
Recall Mode	None	C-Min	C-Min	None
v/c Ratio	0.33	0.61	0.54	0.69
Control Delay	2.6	1.6	8.3	28.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	2.6	1.6	8.3	28.6
Queue Length 50th (ft)	6	90	245	12
Queue Length 95th (ft)	m4	m31	367	27
Internal Link Dist (ft)		774	667	639
Turn Bay Length (ft)	200			
Base Capacity (vph)	358	3033	2704	330
Starvation Cap Reductn	0	90	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.27	0.63	0.54	0.47

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

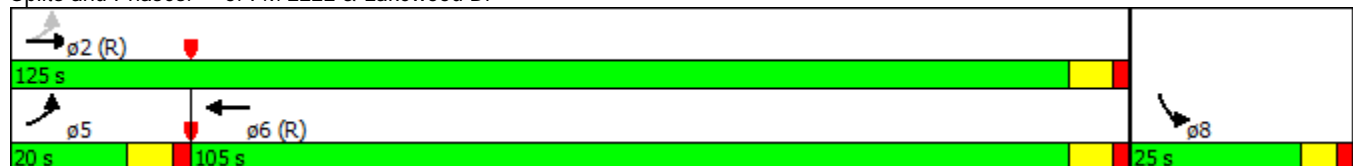
Offset: 48 (32%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: FM 2222 & Lakewood Dr

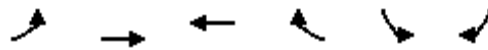


HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

6: FM 2222 & Lakewood Dr

2016 No Build Conditions - AM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	72	1789	1261	8	9	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0		6.0	
Lane Util. Factor	1.00	0.95	0.95		1.00	
Frt	1.00	1.00	1.00		0.88	
Flt Protected	0.95	1.00	1.00		1.00	
Satd. Flow (prot)	1770	3539	3533		1625	
Flt Permitted	0.14	1.00	1.00		1.00	
Satd. Flow (perm)	267	3539	3533		1625	
Peak-hour factor, PHF	0.75	0.97	0.88	0.44	0.67	0.87
Adj. Flow (vph)	96	1844	1433	18	13	143
RTOR Reduction (vph)	0	0	0	0	135	0
Lane Group Flow (vph)	96	1844	1451	0	21	0
Turn Type	pm+pt	NA	NA		NA	
Protected Phases	5	2	6		8	
Permitted Phases	2					
Actuated Green, G (s)	128.6	128.6	114.8		8.4	
Effective Green, g (s)	128.6	128.6	114.8		8.4	
Actuated g/C Ratio	0.86	0.86	0.77		0.06	
Clearance Time (s)	7.0	7.0	7.0		6.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	297	3034	2703		91	
v/s Ratio Prot	0.01	c0.52	0.41		c0.01	
v/s Ratio Perm	0.26					
v/c Ratio	0.32	0.61	0.54		0.23	
Uniform Delay, d1	4.7	3.2	7.0		67.7	
Progression Factor	0.43	0.29	1.00		1.00	
Incremental Delay, d2	0.4	0.6	0.8		1.3	
Delay (s)	2.4	1.5	7.8		69.0	
Level of Service	A	A	A		E	
Approach Delay (s)		1.5	7.8		69.0	
Approach LOS		A	A		E	

Intersection Summary

HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection

Intersection Delay, s/veh 17.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	0	103	0	0	3058	133
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	74	92	92	96	59
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	139	0	0	3185	225

Major/Minor	Minor2	Major2
Conflicting Flow All	3298	1704
Stage 1	3298	-
Stage 2	0	-
Follow-up Headway	3.52	3.32
Pot Capacity-1 Maneuver	3	# 81
Stage 1	9	-
Stage 2	-	-
Time blocked-Platoon, %		-
Mov Capacity-1 Maneuver	3	# 81
Mov Capacity-2 Maneuver	3	-
Stage 1	9	-
Stage 2	-	-

Approach	EB	SB
HCM Control Delay, s	\$ 457	0
HCM LOS	F	

Minor Lane / Major Mvmt	EBLn1	SBT	SBR
Capacity (veh/h)	81	-	-
HCM Lane V/C Ratio	1.718	-	-
HCM Control Delay (s)	\$ 457	-	-
HCM Lane LOS	F		
HCM 95th %tile Q(veh)	11.725	-	-

Notes

~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Queues

Champions Tract #3 TIA

1: Jester Blvd & RM 2222

2016 No Build Conditions - PM Peak



Lane Group	NBL	NBT	NBR	SBL	SBT	NEL	NET	SWL	SWT	SWR
Lane Configurations										
Volume (vph)	60	2495	254	68	1412	5	8	316	7	18
Lane Group Flow (vph)	74	2599	306	92	1605	15	42	194	196	36
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	5	2		1	6	7	4	3	8	
Permitted Phases	2		2	6		4	4	8		8
Detector Phase	5	2	2	1	6	7	4	3	8	8
Switch Phase										
Minimum Initial (s)	5.0	25.0	25.0	5.0	25.0	6.0	5.0	8.0	8.0	8.0
Minimum Split (s)	11.0	32.0	32.0	11.0	32.0	12.0	11.0	14.0	39.0	39.0
Total Split (s)	16.0	100.0	100.0	11.0	95.0	16.0	16.0	23.0	23.0	23.0
Total Split (%)	10.7%	66.7%	66.7%	7.3%	63.3%	10.7%	10.7%	15.3%	15.3%	15.3%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	7.0	7.0	6.0	7.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	None	None	None	None	None
v/c Ratio	0.40	1.15	0.29	0.67	0.71	0.17	0.40	0.82	0.83	0.11
Control Delay	8.9	93.8	8.2	49.3	21.3	72.0	43.0	86.5	87.6	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.9	93.8	8.2	49.3	21.3	72.0	43.0	86.5	87.6	0.7
Queue Length 50th (ft)	20	~1605	83	36	537	14	14	183	185	0
Queue Length 95th (ft)	m24	m#1703	m94	#96	675	14	26	#338	#291	0
Internal Link Dist (ft)		362			394		655		292	
Turn Bay Length (ft)	215		180	225		150				
Base Capacity (vph)	215	2261	1053	137	2253	118	137	238	237	329
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	1.15	0.29	0.67	0.71	0.13	0.31	0.82	0.83	0.11

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Jester Blvd & RM 2222

























HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

1: Jester Blvd & RM 2222

2016 No Build Conditions - PM Peak

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	60	2495	254	68	1412	10	5	8	13	316	7	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	7.0	7.0	6.0	7.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	0.95	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3533		1770	1676		1681	1689	1583
Flt Permitted	0.08	1.00	1.00	0.04	1.00		0.83	1.00		0.83	0.81	1.00
Satd. Flow (perm)	151	3539	1583	81	3533		1552	1676		1475	1441	1583
Peak-hour factor, PHF	0.81	0.96	0.83	0.74	0.89	0.56	0.33	0.58	0.46	0.83	0.75	0.50
Adj. Flow (vph)	74	2599	306	92	1587	18	15	14	28	381	9	36
RTOR Reduction (vph)	0	0	45	0	0	0	0	26	0	0	0	31
Lane Group Flow (vph)	74	2599	261	92	1605	0	15	16	0	194	196	5
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6			4	4		8		8
Actuated Green, G (s)	99.7	92.3	92.3	99.5	92.2		8.4	8.4		21.8	21.8	21.8
Effective Green, g (s)	99.7	92.3	92.3	99.5	92.2		8.4	8.4		21.8	21.8	21.8
Actuated g/C Ratio	0.66	0.62	0.62	0.66	0.61		0.06	0.06		0.15	0.15	0.15
Clearance Time (s)	6.0	7.0	7.0	6.0	7.0		6.0	6.0		6.0	6.0	6.0
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)	180	2177	974	135	2171		92	93		237	237	230
v/s Ratio Prot	0.02	c0.73		c0.03	0.45		0.00	c0.01		0.09	c0.09	
v/s Ratio Perm	0.25		0.17	0.42			0.01			0.03	0.03	0.00
v/c Ratio	0.41	1.19	0.27	0.68	0.74		0.16	0.17		0.82	0.83	0.02
Uniform Delay, d1	17.5	28.9	13.3	40.2	20.4		67.5	67.5		61.9	62.3	55.0
Progression Factor	1.06	0.88	1.05	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	88.8	0.2	13.3	2.3		0.8	0.9		19.3	20.5	0.0
Delay (s)	19.1	114.1	14.1	53.5	22.7		68.3	68.3		81.2	82.7	55.0
Level of Service	B	F	B	D	C		E	E		F	F	E
Approach Delay (s)		101.4			24.4			68.3			79.7	
Approach LOS		F			C			E			E	

Intersection Summary

HCM 2000 Control Delay	73.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	95.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Queues

2: City Park Road & FM 2222

Champions Tract #3 TIA

2016 No Build Conditions - PM Peak



Lane Group	NBL	NBR	SET	NWL	NWT
Lane Configurations	←←	→	←→	→	→→
Volume (vph)	244	467	1917	251	2667
Lane Group Flow (vph)	284	640	2147	273	2807
Turn Type	NA	pt+ov	NA	pm+pt	NA
Protected Phases	4	4 5	6	5	2
Permitted Phases				2	
Detector Phase	4	4 5	6	5	2
Switch Phase					
Minimum Initial (s)	12.0		25.0	10.0	25.0
Minimum Split (s)	20.0		32.0	17.0	32.0
Total Split (s)	20.0		95.0	35.0	130.0
Total Split (%)	13.3%		63.3%	23.3%	86.7%
Yellow Time (s)	4.0		5.0	5.0	5.0
All-Red Time (s)	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0		7.0	7.0	7.0
Lead/Lag			Lead	Lag	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None		None	None	C-Max
v/c Ratio	0.89	1.22	1.04	0.72	0.97
Control Delay	95.1	158.8	52.7	61.4	29.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	95.1	158.8	52.7	61.4	29.9
Queue Length 50th (ft)	144	~765	~1197	182	1104
Queue Length 95th (ft)	#209	#715	#1305	m291	#1192
Internal Link Dist (ft)	1125		1418		298
Turn Bay Length (ft)	500	500		215	
Base Capacity (vph)	320	523	2065	379	2901
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.89	1.22	1.04	0.72	0.97

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:NWTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.












Splits and Phases: 2: City Park Road & FM 2222



HCM Signalized Intersection Capacity Analysis

2: City Park Road & FM 2222

Champions Tract #3 TIA
2016 No Build Conditions - PM Peak

						
Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Volume (vph)	244	467	1917	54	251	2667
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	7.0		7.0	7.0
Lane Util. Factor	0.97	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	1583	3518		1770	3539
Flt Permitted	0.95	1.00	1.00		0.04	1.00
Satd. Flow (perm)	3433	1583	3518		78	3539
Peak-hour factor, PHF	0.86	0.73	0.93	0.63	0.92	0.95
Adj. Flow (vph)	284	640	2061	86	273	2807
RTOR Reduction (vph)	0	6	2	0	0	0
Lane Group Flow (vph)	284	634	2145	0	273	2807
Turn Type	NA	pt+ov	NA		pm+pt	NA
Protected Phases	4	4 5	6		5	2
Permitted Phases					2	
Actuated Green, G (s)	14.0	49.0	88.0		123.0	123.0
Effective Green, g (s)	14.0	42.0	88.0		123.0	123.0
Actuated g/C Ratio	0.09	0.28	0.59		0.82	0.82
Clearance Time (s)	6.0		7.0		7.0	7.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	320	443	2063		379	2901
v/s Ratio Prot	0.08	c0.40	c0.61		0.13	0.79
v/s Ratio Perm					0.45	
v/c Ratio	0.89	1.43	1.04		0.72	0.97
Uniform Delay, d1	67.2	54.0	31.0		52.2	11.8
Progression Factor	1.00	1.00	0.77		1.14	1.84
Incremental Delay, d2	24.2	206.2	28.4		4.5	8.0
Delay (s)	91.5	260.2	52.2		63.8	29.7
Level of Service	F	F	D		E	C
Approach Delay (s)	208.3		52.2			32.7
Approach LOS	F		D			C
Intersection Summary						
HCM 2000 Control Delay			65.9		HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio			1.17			
Actuated Cycle Length (s)			150.0		Sum of lost time (s)	20.0
Intersection Capacity Utilization			95.3%		ICU Level of Service	F
Analysis Period (min)			15			
c Critical Lane Group						

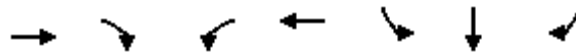
Intersection						
Intersection Delay, s/veh	392					
Movement	SEL	SET	NWT	NWR	SWL	SWR
Vol, veh/h	38	2213	3017	92	127	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	78	89	96	75	63	48
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	49	2487	3143	123	202	135
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	3265	0	-	0	4545	1633
Stage 1	-	-	-	-	3204	-
Stage 2	-	-	-	-	1341	-
Follow-up Headway	2.22	-	-	-	3.52	3.32
Pot Capacity-1 Maneuver	88	-	-	-	# 1	# 90
Stage 1	-	-	-	-	# 19	-
Stage 2	-	-	-	-	208	-
Time blocked-Platoon, %		-	-	-		
Mov Capacity-1 Maneuver	88	-	-	-	# 0	# 90
Mov Capacity-2 Maneuver	-	-	-	-	# 14	-
Stage 1	-	-	-	-	# 19	-
Stage 2	-	-	-	-	# 92	-
Approach	SE		NW		SW	
HCM Control Delay, s	1.7		0		\$ 7126.1	
HCM LOS					F	
Minor Lane / Major Mvmt		NWT	NWR	SEL	SET	SWLn1
Capacity (veh/h)		-	-	88	-	21
HCM Lane V/C Ratio		-	-	0.554	-	16.048
HCM Control Delay (s)		-	-	87.877	-	\$ 7126.1
HCM Lane LOS				F		F
HCM 95th %tile Q(veh)		-	-	2.474	-	42.476
Notes						
~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined						

Queues

4: Loop 360 SB & FM 2222

Champions Tract #3 TIA

2016 No Build Conditions - PM Peak



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR	ø1	ø2	ø4	ø5	ø6
Lane Configurations	↑↑↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑					
Volume (vph)	1755	585	399	2158	200	37	1070					
Lane Group Flow (vph)	1847	688	464	2202	182	191	1176					
Turn Type	NA	Free	pm+pt	NA	Split	NA	Free					
Protected Phases	1 2		6 7	1 2 6 7	4 5	4 5		1	2	4	5	6
Permitted Phases		Free	1 2 6 7				Free					
Detector Phase	1 2		6 7	1 2 6 7	4 5	4 5						
Switch Phase												
Minimum Initial (s)								1.0	25.0	5.0	1.0	12.0
Minimum Split (s)								7.0	31.0	11.0	8.0	22.0
Total Split (s)								8.0	35.0	14.0	8.0	57.0
Total Split (%)								5%	23%	9%	5%	38%
Yellow Time (s)								4.0	4.0	4.0	4.0	4.0
All-Red Time (s)								2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag								Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?								Yes	Yes	Yes	Yes	Yes
Recall Mode								None	C-Max	None	None	None
v/c Ratio	1.17	0.43	0.47	0.77	1.02	1.03	0.74					
Control Delay	131.1	0.1	4.1	6.1	136.0	136.9	3.2					
Queue Delay	0.4	0.0	2.6	47.4	0.0	0.0	0.0					
Total Delay	131.5	0.1	6.7	53.5	136.0	136.9	3.2					
Queue Length 50th (ft)	~630	0	48	861	~196	~208	0					
Queue Length 95th (ft)	m#562	m0	m43	m0	#362	74	0					
Internal Link Dist (ft)	712			342		1059						
Turn Bay Length (ft)												
Base Capacity (vph)	1580	1583	981	2878	179	186	1583					
Starvation Cap Reductn	0	0	385	1027	0	0	0					
Spillback Cap Reductn	160	0	0	0	0	0	0					
Storage Cap Reductn	0	0	0	0	0	0	0					
Reduced v/c Ratio	1.30	0.43	0.78	1.19	1.02	1.03	0.74					

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green

Natural Cycle: 135

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

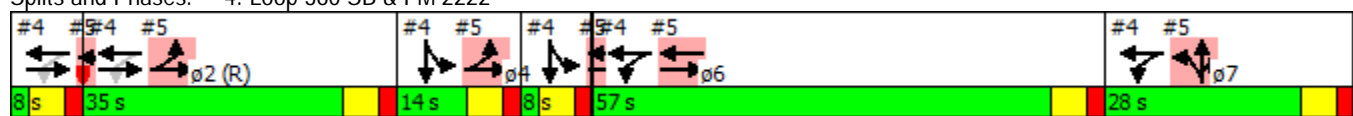
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Loop 360 SB & FM 2222















HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

4: Loop 360 SB & FM 2222

2016 No Build Conditions - PM Peak

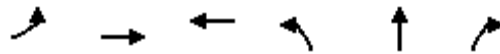
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↗	↖	↑↑					↖	↗	↗
Volume (vph)	0	1755	585	399	2158	0	0	0	0	200	37	1070
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0	6.0	4.0
Lane Util. Factor		0.86	1.00	1.00	0.95					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		6408	1583	1770	3539					1681	1750	1583
Flt Permitted		1.00	1.00	0.11	1.00					0.95	0.99	1.00
Satd. Flow (perm)		6408	1583	201	3539					1681	1750	1583
Peak-hour factor, PHF	0.92	0.95	0.85	0.86	0.98	0.92	0.92	0.92	0.92	0.89	0.25	0.91
Adj. Flow (vph)	0	1847	688	464	2202	0	0	0	0	225	148	1176
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1847	688	464	2202	0	0	0	0	182	191	1176
Turn Type		NA	Free	pm+pt	NA					Split	NA	Free
Protected Phases		1 2		6 7	1 2 6 7					4 5	4 5	
Permitted Phases			Free	1 2 6 7								Free
Actuated Green, G (s)		37.0	150.0	116.0	122.0					16.0	16.0	150.0
Effective Green, g (s)		37.0	150.0	116.0	122.0					16.0	16.0	150.0
Actuated g/C Ratio		0.25	1.00	0.77	0.81					0.11	0.11	1.00
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)		1580	1583	981	2878					179	186	1583
v/s Ratio Prot		c0.29		0.25	c0.62					0.11	c0.11	
v/s Ratio Perm			0.43	0.12								c0.74
v/c Ratio		1.17	0.43	0.47	0.77					1.02	1.03	0.74
Uniform Delay, d1		56.5	0.0	16.5	6.9					67.0	67.0	0.0
Progression Factor		1.14	1.00	0.25	0.82					1.00	1.00	1.00
Incremental Delay, d2		76.7	0.1	0.0	0.1					71.7	73.2	3.2
Delay (s)		141.0	0.1	4.2	5.8					138.7	140.2	3.2
Level of Service		F	A	A	A					F	F	A
Approach Delay (s)		102.7			5.5			0.0			36.0	
Approach LOS		F			A			A			D	
Intersection Summary												
HCM 2000 Control Delay			49.0			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			1.09									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)				36.0		
Intersection Capacity Utilization			113.6%			ICU Level of Service				H		
Analysis Period (min)			15									
c Critical Lane Group												

Queues

5: Loop 360 NB & FM 2222

Champions Tract #3 TIA

2016 No Build Conditions - PM Peak



Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	ø1	ø2	ø4	ø5	ø6	ø7
Lane Configurations	↔↔	↑↑	↑↑↔	↔	↔	↔						
Volume (vph)	868	1082	1856	705	41	568						
Lane Group Flow (vph)	954	1163	2019	406	415	701						
Turn Type	Prot	NA	NA	Split	NA	Prot						
Protected Phases	2 4	2 4 5 6	5 6	1 7	1 7	1 7	1	2	4	5	6	7
Permitted Phases												
Detector Phase	2 4	2 4 5 6	5 6	1 7	1 7	1 7						
Switch Phase												
Minimum Initial (s)							1.0	25.0	5.0	1.0	12.0	9.0
Minimum Split (s)							7.0	31.0	11.0	8.0	22.0	15.0
Total Split (s)							8.0	35.0	14.0	8.0	57.0	28.0
Total Split (%)							5%	23%	9%	5%	38%	19%
Yellow Time (s)							4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)							2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag							Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode							None	C-Max	None	None	None	None
v/c Ratio	0.97	0.46	1.02	1.21	1.22	1.60						
Control Delay	21.2	5.1	55.5	167.7	173.2	308.5						
Queue Delay	41.5	50.3	25.4	0.0	0.0	0.1						
Total Delay	62.6	55.4	80.9	167.7	173.2	308.6						
Queue Length 50th (ft)	454	563	~663	~508	~524	~856						
Queue Length 95th (ft)	m49	m3	#842	#732	#565	#937						
Internal Link Dist (ft)		342	774		892							
Turn Bay Length (ft)												
Base Capacity (vph)	984	2548	1988	336	339	439						
Starvation Cap Reductn	189	1586	0	0	0	0						
Spillback Cap Reductn	0	156	123	0	0	6						
Storage Cap Reductn	0	0	0	0	0	0						
Reduced v/c Ratio	1.20	1.21	1.08	1.21	1.22	1.62						

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green

Natural Cycle: 135

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

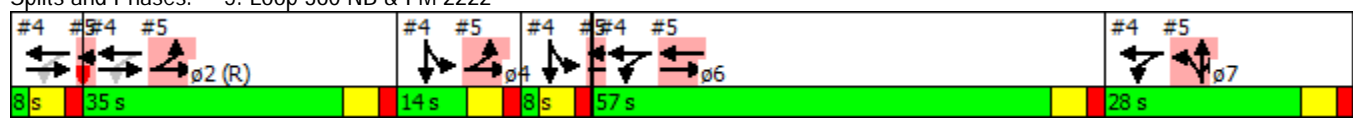
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.




















Splits and Phases: 5: Loop 360 NB & FM 2222



HCM Signalized Intersection Capacity Analysis

5: Loop 360 NB & FM 2222

Champions Tract #3 TIA
2016 No Build Conditions - PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	868	1082	0	0	1856	56	705	41	568	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.95	0.95	1.00			
Frt	1.00	1.00			0.99		1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00		0.95	0.96	1.00			
Satd. Flow (prot)	3433	3539			5045		1681	1696	1583			
Flt Permitted	0.95	1.00			1.00		0.95	0.96	1.00			
Satd. Flow (perm)	3433	3539			5045		1681	1696	1583			
Peak-hour factor, PHF	0.91	0.93	0.92	0.92	0.97	0.53	0.92	0.75	0.81	0.92	0.92	0.92
Adj. Flow (vph)	954	1163	0	0	1913	106	766	55	701	0	0	0
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	122	0	0	0
Lane Group Flow (vph)	954	1163	0	0	2015	0	406	415	579	0	0	0
Turn Type	Prot	NA			NA		Split	NA	Prot			
Protected Phases	2 4	2 4 5 6			5 6		1 7	1 7	1 7			
Permitted Phases												
Actuated Green, G (s)	43.0	108.0			59.0		30.0	30.0	30.0			
Effective Green, g (s)	43.0	108.0			59.0		30.0	30.0	30.0			
Actuated g/C Ratio	0.29	0.72			0.39		0.20	0.20	0.20			
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)	984	2548			1984		336	339	316			
v/s Ratio Prot	c0.28	0.33			c0.40		0.24	0.24	c0.37			
v/s Ratio Perm												
v/c Ratio	0.97	0.46			1.02		1.21	1.22	1.83			
Uniform Delay, d1	52.9	8.8			45.5		60.0	60.0	60.0			
Progression Factor	0.29	0.57			0.83		1.00	1.00	1.00			
Incremental Delay, d2	3.8	0.0			17.9		118.4	124.4	386.1			
Delay (s)	19.1	5.0			55.8		178.4	184.4	446.1			
Level of Service	B	A			E		F	F	F			
Approach Delay (s)		11.4			55.8			303.3			0.0	
Approach LOS		B			E			F			A	
Intersection Summary												
HCM 2000 Control Delay			105.8				HCM 2000 Level of Service		F			
HCM 2000 Volume to Capacity ratio			1.37									
Actuated Cycle Length (s)			150.0				Sum of lost time (s)		36.0			
Intersection Capacity Utilization			113.6%				ICU Level of Service		H			
Analysis Period (min)			15									
c Critical Lane Group												

Queues

6: FM 2222 & Lakewood Dr

Champions Tract #3 TIA

2016 No Build Conditions - PM Peak



Lane Group	EBL	EBT	WBT	SBL
Lane Configurations				
Volume (vph)	216	1560	1708	21
Lane Group Flow (vph)	284	1733	1945	188
Turn Type	pm+pt	NA	NA	NA
Protected Phases	5	2	6	8
Permitted Phases	2			
Detector Phase	5	2	6	8
Switch Phase				
Minimum Initial (s)	5.0	25.0	25.0	5.0
Minimum Split (s)	12.0	32.0	32.0	22.0
Total Split (s)	25.0	125.0	100.0	25.0
Total Split (%)	16.7%	83.3%	66.7%	16.7%
Yellow Time (s)	5.0	5.0	5.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	6.0
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?	Yes		Yes	
Recall Mode	None	C-Min	C-Min	None
v/c Ratio	0.80	0.59	0.89	0.76
Control Delay	50.9	11.4	31.1	42.3
Queue Delay	0.0	0.2	0.0	0.0
Total Delay	50.9	11.6	31.1	42.3
Queue Length 50th (ft)	177	737	808	56
Queue Length 95th (ft)	m#224	m695	934	56
Internal Link Dist (ft)		774	667	639
Turn Bay Length (ft)	200			
Base Capacity (vph)	353	2958	2185	320
Starvation Cap Reductn	0	471	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.80	0.70	0.89	0.59

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 48 (32%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 100

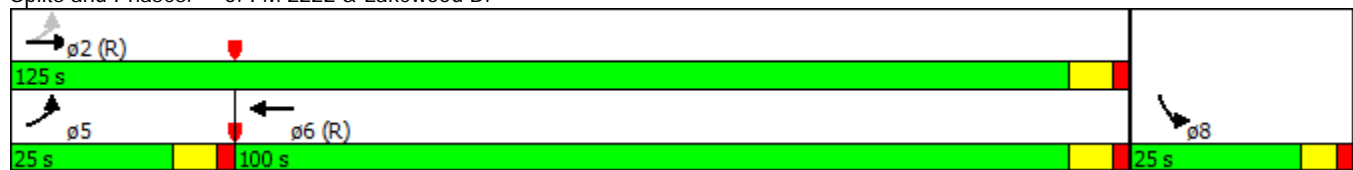
Control Type: Actuated-Coordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: FM 2222 & Lakewood Dr

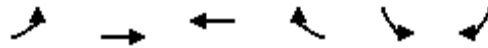


HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

6: FM 2222 & Lakewood Dr

2016 No Build Conditions - PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	216	1560	1708	58	21	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0		6.0	
Lane Util. Factor	1.00	0.95	0.95		1.00	
Frt	1.00	1.00	0.99		0.89	
Flt Protected	0.95	1.00	1.00		0.99	
Satd. Flow (prot)	1770	3539	3521		1641	
Flt Permitted	0.04	1.00	1.00		0.99	
Satd. Flow (perm)	75	3539	3521		1641	
Peak-hour factor, PHF	0.76	0.90	0.91	0.85	0.64	0.87
Adj. Flow (vph)	284	1733	1877	68	33	155
RTOR Reduction (vph)	0	0	2	0	119	0
Lane Group Flow (vph)	284	1733	1943	0	69	0
Turn Type	pm+pt	NA	NA		NA	
Protected Phases	5	2	6		8	
Permitted Phases	2					
Actuated Green, G (s)	125.4	125.4	92.7		11.6	
Effective Green, g (s)	125.4	125.4	92.7		11.6	
Actuated g/C Ratio	0.84	0.84	0.62		0.08	
Clearance Time (s)	7.0	7.0	7.0		6.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	353	2958	2175		126	
v/s Ratio Prot	c0.14	0.49	c0.55		c0.04	
v/s Ratio Perm	0.54					
v/c Ratio	0.80	0.59	0.89		0.55	
Uniform Delay, d1	51.2	4.0	24.4		66.7	
Progression Factor	0.89	2.41	1.00		1.00	
Incremental Delay, d2	7.2	0.5	6.2		4.8	
Delay (s)	52.9	10.0	30.6		71.5	
Level of Service	D	B	C		E	
Approach Delay (s)		16.0	30.6		71.5	
Approach LOS		B	C		E	

Intersection Summary

HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection

Intersection Delay, s/veh 49.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	0	159	0	0	2660	91
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	63	92	92	94	67
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	252	0	0	2830	136

Major/Minor	Minor2	Major2
Conflicting Flow All	2898	1482
Stage 1	2898	-
Stage 2	0	-
Follow-up Headway	3.52	3.32
Pot Capacity-1 Maneuver	7	# 114
Stage 1	16	-
Stage 2	-	-
Time blocked-Platoon, %		-
Mov Capacity-1 Maneuver	7	# 114
Mov Capacity-2 Maneuver	7	-
Stage 1	16	-
Stage 2	-	-

Approach	EB	SB
HCM Control Delay, s	\$ 635.4	0
HCM LOS	F	

Minor Lane / Major Mvmt	EBLn1	SBT	SBR
Capacity (veh/h)	114	-	-
HCM Lane V/C Ratio	2.214	-	-
HCM Control Delay (s)	\$ 635.4	-	-
HCM Lane LOS	F		
HCM 95th %tile Q(veh)	21.666	-	-

Notes

~ : Volume Exceeds Capacity; \$: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Appendix F: Synchro Reports – 2016 Build-Out Conditions

Timings

1: Jester Blvd & FM 2222

Champions Tract #3 TIA

2016 Build Out Conditions - AM Peak



Lane Group	NBL	NBT	NBR	SBL	SBT	NEL	NET	SWL	SWT	SWR
Lane Configurations										
Traffic Volume (vph)	7	1316	100	41	2809	6	2	186	1	7
Future Volume (vph)	7	1316	100	41	2809	6	2	186	1	7
Lane Group Flow (vph)	9	1415	147	68	2992	14	120	121	121	18
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	5	2		1	6	7	4	3	8	
Permitted Phases	2		2	6		4	4	8		8
Detector Phase	5	2	2	1	6	7	4	3	8	8
Switch Phase										
Minimum Initial (s)	5.0	25.0	25.0	5.0	25.0	5.0	5.0	8.0	8.0	8.0
Minimum Split (s)	11.0	32.0	32.0	11.0	32.0	11.0	11.0	14.0	39.0	39.0
Total Split (s)	15.0	99.0	99.0	11.0	95.0	16.0	16.0	24.0	24.0	24.0
Total Split (%)	10.0%	66.0%	66.0%	7.3%	63.3%	10.7%	10.7%	16.0%	16.0%	16.0%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	7.0	7.0	6.0	7.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	None	None	None	None	None
v/c Ratio	0.08	0.62	0.14	0.32	1.22	0.12	0.76	0.56	0.56	0.05
Control Delay	5.1	6.4	1.0	11.1	126.2	68.2	63.4	68.9	68.9	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.1	6.4	1.0	11.1	126.2	68.2	63.4	68.9	68.9	0.3
Queue Length 50th (ft)	1	113	0	20	~1892	13	55	105	105	0
Queue Length 95th (ft)	m2	187	3	23	#2155	17	40	167	50	0
Internal Link Dist (ft)		362			394		655		292	
Turn Bay Length (ft)	215		180	225		150				
Base Capacity (vph)	157	2296	1066	211	2456	139	167	233	216	351
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.62	0.14	0.32	1.22	0.10	0.72	0.52	0.56	0.05

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

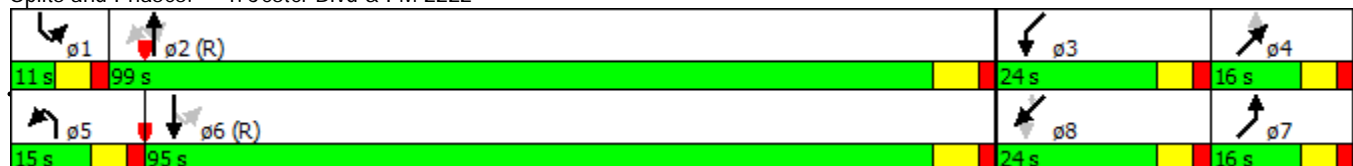
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Jester Blvd & FM 2222

























HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

1: Jester Blvd & FM 2222

2016 Build Out Conditions - AM Peak

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	7	1316	100	41	2809	1	6	2	93	186	1	7
Future Volume (vph)	7	1316	100	41	2809	1	6	2	93	186	1	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	7.0	7.0	6.0	7.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	0.95	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539		1770	1593		1681	1688	1583
Flt Permitted	0.04	1.00	1.00	0.12	1.00		0.68	1.00		0.45	0.44	1.00
Satd. Flow (perm)	80	3539	1583	217	3539		1258	1593		795	782	1583
Peak-hour factor, PHF	0.75	0.93	0.68	0.60	0.94	0.25	0.42	0.50	0.80	0.78	0.25	0.38
Adj. Flow (vph)	9	1415	147	68	2988	4	14	4	116	238	4	18
RTOR Reduction (vph)	0	0	42	0	0	0	0	57	0	0	0	15
Lane Group Flow (vph)	9	1415	105	68	2992	0	14	63	0	121	121	3
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6			4	4		8		8
Actuated Green, G (s)	93.8	92.6	92.6	100.2	95.8		12.9	12.9		24.0	24.0	24.0
Effective Green, g (s)	93.8	92.6	92.6	100.2	95.8		12.9	12.9		24.0	24.0	24.0
Actuated g/C Ratio	0.63	0.62	0.62	0.67	0.64		0.09	0.09		0.16	0.16	0.16
Clearance Time (s)	6.0	7.0	7.0	6.0	7.0		6.0	6.0		6.0	6.0	6.0
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)	63	2184	977	190	2260		121	136		216	216	253
v/s Ratio Prot	0.00	0.40		c0.01	c0.85		0.00	c0.04		c0.06	0.06	
v/s Ratio Perm	0.09		0.07	0.23			0.01			0.03	c0.03	0.00
v/c Ratio	0.14	0.65	0.11	0.36	1.32		0.12	0.47		0.56	0.56	0.01
Uniform Delay, d1	36.9	18.3	11.8	14.2	27.1		63.4	65.3		57.1	58.1	53.0
Progression Factor	0.58	0.32	0.22	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.8	1.2	0.2	1.2	148.9		0.4	2.5		3.3	3.3	0.0
Delay (s)	22.1	7.1	2.8	15.3	176.0		63.8	67.8		60.4	61.4	53.0
Level of Service	C	A	A	B	F		E	E		E	E	D
Approach Delay (s)		6.8			172.5			67.4			60.4	
Approach LOS		A			F			E			E	

Intersection Summary

HCM 2000 Control Delay	112.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	100.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Timings

2: City Park Road & FM 2222

Champions Tract #3 TIA

2016 Build Out Conditions - AM Peak



Lane Group	NBL	NBR	SET	NWL	NWT
Lane Configurations	←←	→	←→	←	→→
Traffic Volume (vph)	58	350	2897	236	1570
Future Volume (vph)	58	350	2897	236	1570
Lane Group Flow (vph)	72	389	3354	299	1670
Turn Type	Prot	pt+ov	NA	pm+pt	NA
Protected Phases	4	4 5	6	5	2
Permitted Phases				2	
Detector Phase	4	4 5	6	5	2
Switch Phase					
Minimum Initial (s)	12.0		20.0	5.0	20.0
Minimum Split (s)	20.0		29.0	14.0	29.0
Total Split (s)	32.0		93.0	25.0	118.0
Total Split (%)	21.3%		62.0%	16.7%	78.7%
Yellow Time (s)	4.0		5.0	5.0	5.0
All-Red Time (s)	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0		7.0	7.0	7.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None		None	None	C-Max
v/c Ratio	0.12	0.72	1.67	1.13	0.64
Control Delay	53.1	52.2	324.0	131.3	19.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	53.1	52.2	324.0	131.3	19.9
Queue Length 50th (ft)	30	332	~2530	~283	785
Queue Length 95th (ft)	49	461	m#1956	#382	860
Internal Link Dist (ft)	664		1418		595
Turn Bay Length (ft)	500	500		215	
Base Capacity (vph)	595	527	2004	264	2621
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.12	0.74	1.67	1.13	0.64

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:NWTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: City Park Road & FM 2222



HCM Signalized Intersection Capacity Analysis

2: City Park Road & FM 2222

Champions Tract #3 TIA
2016 Build Out Conditions - AM Peak



Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations	↰↱	↰	↰↱		↰	↰↱
Traffic Volume (vph)	58	350	2897	272	236	1570
Future Volume (vph)	58	350	2897	272	236	1570
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	7.0		7.0	7.0
Lane Util. Factor	0.97	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	1583	3486		1770	3539
Flt Permitted	0.95	1.00	1.00		0.04	1.00
Satd. Flow (perm)	3433	1583	3486		80	3539
Peak-hour factor, PHF	0.81	0.90	0.96	0.81	0.79	0.94
Adj. Flow (vph)	72	389	3018	336	299	1670
RTOR Reduction (vph)	0	1	6	0	0	0
Lane Group Flow (vph)	72	388	3348	0	299	1670
Turn Type	Prot	pt+ov	NA		pm+pt	NA
Protected Phases	4	4 5	6		5	2
Permitted Phases					2	
Actuated Green, G (s)	25.9	50.0	86.0		111.1	111.1
Effective Green, g (s)	25.9	50.0	86.0		111.1	111.1
Actuated g/C Ratio	0.17	0.33	0.57		0.74	0.74
Clearance Time (s)	6.0		7.0		7.0	7.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	592	527	1998		263	2621
v/s Ratio Prot	0.02	c0.25	c0.96		c0.14	0.47
v/s Ratio Perm					0.70	
v/c Ratio	0.12	0.74	1.68		1.14	0.64
Uniform Delay, d1	52.4	44.2	32.0		56.5	9.6
Progression Factor	1.00	1.00	0.55		0.83	1.94
Incremental Delay, d2	0.1	5.3	304.4		94.9	1.1
Delay (s)	52.5	49.5	322.0		141.8	19.6
Level of Service	D	D	F		F	B
Approach Delay (s)	50.0		322.0			38.1
Approach LOS	D		F			D

Intersection Summary

HCM 2000 Control Delay	203.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.43		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	128.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Intersection

Int Delay, s/veh 35.4

Movement	SEL	SET	NWT	NWR	SWL	SWR
Traffic Vol, veh/h	55	3239	1841	175	78	38
Future Vol, veh/h	55	3239	1841	175	78	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	44	95	93	63	87	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	125	3409	1980	278	90	45

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	2257	0	4073
Stage 1	-	-	2118
Stage 2	-	-	1955
Critical Hdwy	4.14	-	6.84
Critical Hdwy Stg 1	-	-	5.84
Critical Hdwy Stg 2	-	-	5.84
Follow-up Hdwy	2.22	-	3.52
Pot Cap-1 Maneuver	224	-	~ 2
Stage 1	-	-	~ 78
Stage 2	-	-	96
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	224	-	~ 1
Mov Cap-2 Maneuver	-	-	~ 25
Stage 1	-	-	~ 78
Stage 2	-	-	~ 42

Approach	SE	NW	SW
HCM Control Delay, s	1.4	0	\$ 1518.6
HCM LOS			F

Minor Lane/Major Mvmt	NWT	NWR	SEL	SETSWLn1
Capacity (veh/h)	-	-	224	- 35
HCM Lane V/C Ratio	-	-	0.558	- 3.854
HCM Control Delay (s)	-	-	39.6	\$ 1518.6
HCM Lane LOS	-	-	E	- F
HCM 95th %tile Q(veh)	-	-	3	- 15.7

Notes

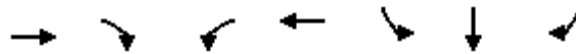
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Timings

4: Loop 360 SB & FM 2222

Champions Tract #3 TIA

2016 Build Out Conditions - AM Peak



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR	ø1	ø2	ø4	ø5	ø6
Lane Configurations	↑↑↑↑	↑	↑	↑↑	↑	↑	↑					
Traffic Volume (vph)	2472	756	595	1294	220	108	654					
Future Volume (vph)	2472	756	595	1294	220	108	654					
Lane Group Flow (vph)	2687	796	620	1470	190	198	719					
Turn Type	NA	Free	pm+pt	NA	Split	NA	Free					
Protected Phases	1 2		6 7	1 2 6 7	4 5	4 5		1	2	4	5	6
Permitted Phases		Free	1 2 6 7				Free					
Detector Phase	1 2		6 7	1 2 6 7	4 5	4 5						
Switch Phase												
Minimum Initial (s)								1.0	25.0	5.0	1.0	12.0
Minimum Split (s)								7.0	31.0	11.0	8.0	22.0
Total Split (s)								8.0	69.0	14.0	8.0	36.0
Total Split (%)								5%	46%	9%	5%	24%
Yellow Time (s)								4.0	4.0	4.0	4.0	4.0
All-Red Time (s)								2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag								Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?								Yes	Yes	Yes	Yes	Yes
Recall Mode								None	C-Max	None	None	None
v/c Ratio	0.89	0.50	1.07	0.51	1.06	1.07	0.45					
Control Delay	56.3	0.1	60.2	5.1	146.0	147.1	0.9					
Queue Delay	0.2	0.0	0.0	49.7	0.0	0.0	0.0					
Total Delay	56.4	0.1	60.2	54.9	146.0	147.1	0.9					
Queue Length 50th (ft)	775	0	~610	578	~214	~224	0					
Queue Length 95th (ft)	m495	m0	m107	m1	#368	#333	0					
Internal Link Dist (ft)	712			342		1059						
Turn Bay Length (ft)												
Base Capacity (vph)	3033	1583	580	2878	179	185	1583					
Starvation Cap Reductn	0	0	0	1787	0	0	0					
Spillback Cap Reductn	38	0	0	0	0	0	0					
Storage Cap Reductn	0	0	0	0	0	0	0					
Reduced v/c Ratio	0.90	0.50	1.07	1.35	1.06	1.07	0.45					

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

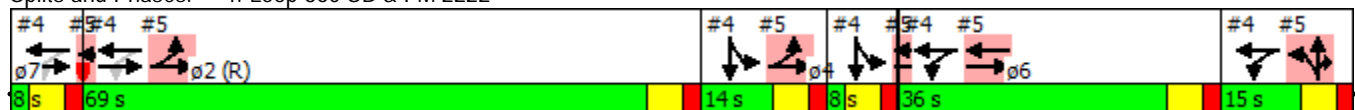
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Loop 360 SB & FM 2222



Kimley-Horn

Synchro 9 Report

Timings

4: Loop 360 SB & FM 2222

Champions Tract #3 TIA

2016 Build Out Conditions - AM Peak

Lane Group	ø7
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	7
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	9.0
Minimum Split (s)	15.0
Total Split (s)	15.0
Total Split (%)	10%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Recall Mode	None
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

4: Loop 360 SB & FM 2222

2016 Build Out Conditions - AM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↗	↖	↑↑					↘	↗	↖
Traffic Volume (vph)	0	2472	756	595	1294	0	0	0	0	220	108	654
Future Volume (vph)	0	2472	756	595	1294	0	0	0	0	220	108	654
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0	6.0	4.0
Lane Util. Factor		0.86	1.00	1.00	0.95					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.98	1.00
Satd. Flow (prot)		6408	1583	1770	3539					1681	1742	1583
Flt Permitted		1.00	1.00	0.06	1.00					0.95	0.98	1.00
Satd. Flow (perm)		6408	1583	105	3539					1681	1742	1583
Peak-hour factor, PHF	0.92	0.92	0.95	0.96	0.88	0.92	0.92	0.92	0.92	0.87	0.80	0.91
Adj. Flow (vph)	0	2687	796	620	1470	0	0	0	0	253	135	719
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2687	796	620	1470	0	0	0	0	190	198	719
Turn Type		NA	Free	pm+pt	NA					Split	NA	Free
Protected Phases		1 2		6 7	1 2 6 7					4 5	4 5	
Permitted Phases			Free	1 2 6 7								Free
Actuated Green, G (s)		71.0	150.0	116.0	122.0					16.0	16.0	150.0
Effective Green, g (s)		71.0	150.0	116.0	122.0					16.0	16.0	150.0
Actuated g/C Ratio		0.47	1.00	0.77	0.81					0.11	0.11	1.00
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)		3033	1583	580	2878					179	185	1583
v/s Ratio Prot		0.42		c0.32	0.42					0.11	c0.11	
v/s Ratio Perm			0.50	c0.51								0.45
v/c Ratio		0.89	0.50	1.07	0.51					1.06	1.07	0.45
Uniform Delay, d1		35.8	0.0	46.9	4.5					67.0	67.0	0.0
Progression Factor		1.55	1.00	0.52	1.12					1.00	1.00	1.00
Incremental Delay, d2		0.3	0.1	34.9	0.0					84.5	86.1	0.9
Delay (s)		55.7	0.1	59.5	5.0					151.5	153.1	0.9
Level of Service		E	A	E	A					F	F	A
Approach Delay (s)		43.0			21.2			0.0			54.0	
Approach LOS		D			C			A			D	

Intersection Summary

HCM 2000 Control Delay	38.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	36.0
Intersection Capacity Utilization	92.7%	ICU Level of Service	F
Analysis Period (min)	15		

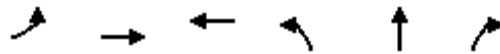
c Critical Lane Group

Timings

5: Loop 360 NB & FM 2222

Champions Tract #3 TIA

2016 Build Out Conditions - AM Peak



Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	ø1	ø2	ø4	ø5	ø6	ø7
Lane Configurations	↔↔	↑↑	↑↑↑	↔	↔	↔						
Traffic Volume (vph)	1180	1507	1368	531	22	382						
Future Volume (vph)	1180	1507	1368	531	22	382						
Lane Group Flow (vph)	1297	1586	1632	306	303	478						
Turn Type	Prot	NA	NA	Split	NA	Prot						
Protected Phases	2 4	2 4 5 6	5 6	1 7	1 7	1 7	1	2	4	5	6	7
Permitted Phases												
Detector Phase	2 4	2 4 5 6	5 6	1 7	1 7	1 7						
Switch Phase												
Minimum Initial (s)							1.0	25.0	5.0	1.0	12.0	9.0
Minimum Split (s)							7.0	31.0	11.0	8.0	22.0	15.0
Total Split (s)							8.0	69.0	14.0	8.0	36.0	15.0
Total Split (%)							5%	46%	9%	5%	24%	10%
Yellow Time (s)							4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)							2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag							Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode							None	C-Max	None	None	None	None
v/c Ratio	0.74	0.56	1.28	1.61	1.59	1.52						
Control Delay	8.0	1.3	181.1	337.5	327.7	276.9						
Queue Delay	2.3	2.7	0.5	0.0	0.0	0.0						
Total Delay	10.3	4.0	181.6	337.5	327.7	276.9						
Queue Length 50th (ft)	57	0	~753	~450	~442	~513						
Queue Length 95th (ft)	m79	m0	#853	#654	#437	#606						
Internal Link Dist (ft)		342	774		892							
Turn Bay Length (ft)												
Base Capacity (vph)	1762	2854	1279	190	191	315						
Starvation Cap Reductn	322	1113	0	0	0	0						
Spillback Cap Reductn	0	0	148	0	0	0						
Storage Cap Reductn	0	0	0	0	0	0						
Reduced v/c Ratio	0.90	0.91	1.44	1.61	1.59	1.52						

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

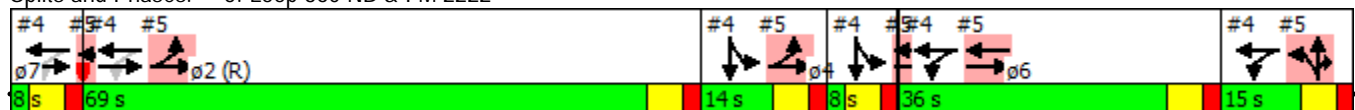
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Loop 360 NB & FM 2222



Kimley-Horn

Synchro 9 Report

Timings

6: FM 2222 & Lakewood Dr

Champions Tract #3 TIA

2016 Build Out Conditions - AM Peak



Lane Group	EBL	EBT	WBT	SBL
Lane Configurations				
Traffic Volume (vph)	72	1821	1269	9
Future Volume (vph)	72	1821	1269	9
Lane Group Flow (vph)	96	1877	1460	156
Turn Type	pm+pt	NA	NA	Prot
Protected Phases	5	2	6	8
Permitted Phases	2			
Detector Phase	5	2	6	8
Switch Phase				
Minimum Initial (s)	5.0	25.0	25.0	5.0
Minimum Split (s)	12.0	32.0	32.0	22.0
Total Split (s)	18.0	124.0	106.0	26.0
Total Split (%)	12.0%	82.7%	70.7%	17.3%
Yellow Time (s)	5.0	5.0	5.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	6.0
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?	Yes		Yes	
Recall Mode	None	C-Min	C-Min	None
v/c Ratio	0.33	0.62	0.54	0.69
Control Delay	2.5	1.5	8.3	28.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	2.5	1.5	8.3	28.6
Queue Length 50th (ft)	6	83	248	12
Queue Length 95th (ft)	m2	m20	372	27
Internal Link Dist (ft)		774	667	639
Turn Bay Length (ft)	200			
Base Capacity (vph)	337	3033	2704	340
Starvation Cap Reductn	0	88	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.28	0.64	0.54	0.46

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

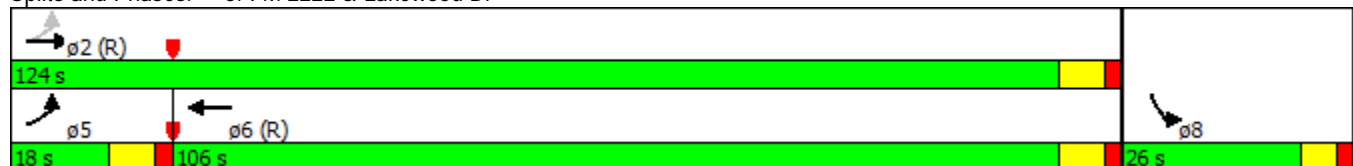
Offset: 48 (32%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: FM 2222 & Lakewood Dr

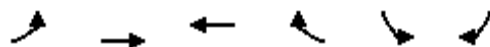


HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

6: FM 2222 & Lakewood Dr

2016 Build Out Conditions - AM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	72	1821	1269	8	9	124
Future Volume (vph)	72	1821	1269	8	9	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0		6.0	
Lane Util. Factor	1.00	0.95	0.95		1.00	
Frt	1.00	1.00	1.00		0.88	
Flt Protected	0.95	1.00	1.00		1.00	
Satd. Flow (prot)	1770	3539	3533		1625	
Flt Permitted	0.14	1.00	1.00		1.00	
Satd. Flow (perm)	264	3539	3533		1625	
Peak-hour factor, PHF	0.75	0.97	0.88	0.44	0.67	0.87
Adj. Flow (vph)	96	1877	1442	18	13	143
RTOR Reduction (vph)	0	0	0	0	135	0
Lane Group Flow (vph)	96	1877	1460	0	21	0
Turn Type	pm+pt	NA	NA		Prot	
Protected Phases	5	2	6		8	
Permitted Phases	2					
Actuated Green, G (s)	128.6	128.6	114.8		8.4	
Effective Green, g (s)	128.6	128.6	114.8		8.4	
Actuated g/C Ratio	0.86	0.86	0.77		0.06	
Clearance Time (s)	7.0	7.0	7.0		6.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	294	3034	2703		91	
v/s Ratio Prot	0.01	c0.53	0.41		c0.01	
v/s Ratio Perm	0.26					
v/c Ratio	0.33	0.62	0.54		0.23	
Uniform Delay, d1	4.8	3.3	7.0		67.7	
Progression Factor	0.36	0.25	1.00		1.00	
Incremental Delay, d2	0.4	0.6	0.8		1.3	
Delay (s)	2.1	1.4	7.8		69.0	
Level of Service	A	A	A		E	
Approach Delay (s)		1.4	7.8		69.0	
Approach LOS		A	A		E	

Intersection Summary

HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection

Int Delay, s/veh 18.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	0	103	0	0	3070	133
Future Vol, veh/h	0	103	0	0	3070	133
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	74	92	92	96	59
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	139	0	0	3198	225

Major/Minor	Minor2	Major2
Conflicting Flow All	3311	1711
Stage 1	3311	-
Stage 2	0	-
Critical Hdwy	7.54	6.94
Critical Hdwy Stg 1	6.54	-
Critical Hdwy Stg 2	-	-
Follow-up Hdwy	3.52	3.32
Pot Cap-1 Maneuver	3	~ 80
Stage 1	8	-
Stage 2	-	-
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	3	~ 80
Mov Cap-2 Maneuver	3	-
Stage 1	8	-
Stage 2	-	-

Approach	EB	SB
HCM Control Delay, s	\$ 467.4	0
HCM LOS	F	

Minor Lane/Major Mvmt	EBLn1	SBT	SBR
Capacity (veh/h)	80	-	-
HCM Lane V/C Ratio	1.74	-	-
HCM Control Delay (s)	\$ 467.4	-	-
HCM Lane LOS	F	-	-
HCM 95th %tile Q(veh)	11.8	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh 8.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	0	109	0	1896	3185	4
Future Vol, veh/h	0	109	0	1896	3185	4
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	-	-	-	-
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	118	0	2061	3462	4

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	4494	1733	3466 0
Stage 1	3464	-	- -
Stage 2	1030	-	- -
Critical Hdwy	6.84	6.94	4.14 -
Critical Hdwy Stg 1	5.84	-	- -
Critical Hdwy Stg 2	5.84	-	- -
Follow-up Hdwy	3.52	3.32	2.22 -
Pot Cap-1 Maneuver	1	~ 77	73 -
Stage 1	13	-	- -
Stage 2	305	-	- -
Platoon blocked, %			- -
Mov Cap-1 Maneuver	1	~ 77	73 -
Mov Cap-2 Maneuver	11	-	- -
Stage 1	13	-	- -
Stage 2	305	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	\$ 389.9	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	73	-	77	-	-
HCM Lane V/C Ratio	-	-	1.539	-	-
HCM Control Delay (s)	0	-	\$ 389.9	-	-
HCM Lane LOS	A	-	F	-	-
HCM 95th %tile Q(veh)	0	-	9.7	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh 0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	397	1	28	481	3	17
Future Vol, veh/h	397	1	28	481	3	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	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	432	1	30	523	3	18

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	433
Stage 1	-	-	432
Stage 2	-	-	584
Critical Hdwy	-	4.12	6.42
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	-	2.218	3.518
Pot Cap-1 Maneuver	-	1127	264
Stage 1	-	-	655
Stage 2	-	-	557
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	1127	254
Mov Cap-2 Maneuver	-	-	254
Stage 1	-	-	655
Stage 2	-	-	536

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	12.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	512	-	-	1127	-
HCM Lane V/C Ratio	0.042	-	-	0.027	-
HCM Control Delay (s)	12.3	-	-	8.3	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Timings

1: Jester Blvd & FM 2222

Champions Tract #3 TIA

2016 Build Out Conditions - PM Peak



Lane Group	NBL	NBT	NBR	SBL	SBT	NEL	NET	SWL	SWT	SWR
Lane Configurations										
Traffic Volume (vph)	60	2504	254	68	1429	5	8	316	7	18
Future Volume (vph)	60	2504	254	68	1429	5	8	316	7	18
Lane Group Flow (vph)	74	2608	306	92	1624	15	42	194	196	36
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	5	2		1	6	7	4	3	8	
Permitted Phases	2		2	6		4	4	8		8
Detector Phase	5	2	2	1	6	7	4	3	8	8
Switch Phase										
Minimum Initial (s)	5.0	25.0	25.0	5.0	25.0	6.0	5.0	8.0	8.0	8.0
Minimum Split (s)	11.0	32.0	32.0	11.0	32.0	12.0	11.0	14.0	39.0	39.0
Total Split (s)	16.0	100.0	100.0	11.0	95.0	16.0	16.0	23.0	23.0	23.0
Total Split (%)	10.7%	66.7%	66.7%	7.3%	63.3%	10.7%	10.7%	15.3%	15.3%	15.3%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	7.0	7.0	6.0	7.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	None	None	None	None	None
v/c Ratio	0.41	1.15	0.29	0.67	0.72	0.17	0.40	0.82	0.83	0.11
Control Delay	9.0	95.5	8.2	49.4	21.7	72.0	43.0	86.5	87.6	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.0	95.5	8.2	49.4	21.7	72.0	43.0	86.5	87.6	0.7
Queue Length 50th (ft)	19	~1613	83	36	550	14	14	183	185	0
Queue Length 95th (ft)	m24	m#1713	m93	#96	695	14	26	#338	#291	0
Internal Link Dist (ft)		362			394		655		292	
Turn Bay Length (ft)	215		180	225		150				
Base Capacity (vph)	210	2261	1053	137	2252	118	137	238	237	329
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	1.15	0.29	0.67	0.72	0.13	0.31	0.82	0.83	0.11

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Jester Blvd & FM 2222























ø1	ø2 (R)	ø3	ø4	ø5	ø6 (R)	ø7	ø8
11 s	100 s	23 s	16 s	16 s	95 s	23 s	16 s

HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

1: Jester Blvd & FM 2222

2016 Build Out Conditions - PM Peak

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	60	2504	254	68	1429	10	5	8	13	316	7	18
Future Volume (vph)	60	2504	254	68	1429	10	5	8	13	316	7	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	7.0	7.0	6.0	7.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	0.95	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3533		1770	1676		1681	1689	1583
Flt Permitted	0.08	1.00	1.00	0.04	1.00		0.83	1.00		0.83	0.81	1.00
Satd. Flow (perm)	144	3539	1583	81	3533		1552	1676		1475	1441	1583
Peak-hour factor, PHF	0.81	0.96	0.83	0.74	0.89	0.56	0.33	0.58	0.46	0.83	0.75	0.50
Adj. Flow (vph)	74	2608	306	92	1606	18	15	14	28	381	9	36
RTOR Reduction (vph)	0	0	44	0	0	0	0	26	0	0	0	31
Lane Group Flow (vph)	74	2608	262	92	1624	0	15	16	0	194	196	5
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6			4	4		8		8
Actuated Green, G (s)	99.8	92.3	92.3	99.4	92.1		8.4	8.4		21.8	21.8	21.8
Effective Green, g (s)	99.8	92.3	92.3	99.4	92.1		8.4	8.4		21.8	21.8	21.8
Actuated g/C Ratio	0.67	0.62	0.62	0.66	0.61		0.06	0.06		0.15	0.15	0.15
Clearance Time (s)	6.0	7.0	7.0	6.0	7.0		6.0	6.0		6.0	6.0	6.0
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)	177	2177	974	135	2169		92	93		237	237	230
v/s Ratio Prot	0.02	c0.74		c0.03	0.46		0.00	c0.01		0.09	c0.09	
v/s Ratio Perm	0.26		0.17	0.42			0.01			0.03	0.03	0.00
v/c Ratio	0.42	1.20	0.27	0.68	0.75		0.16	0.17		0.82	0.83	0.02
Uniform Delay, d1	18.1	28.9	13.3	40.2	20.7		67.5	67.5		61.9	62.3	55.0
Progression Factor	1.05	0.88	1.04	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	90.6	0.2	13.3	2.4		0.8	0.9		19.3	20.5	0.0
Delay (s)	19.6	115.8	14.0	53.4	23.1		68.3	68.3		81.2	82.7	55.0
Level of Service	B	F	B	D	C		E	E		F	F	E
Approach Delay (s)		103.0			24.7			68.3			79.7	
Approach LOS		F			C			E			E	

Intersection Summary

HCM 2000 Control Delay	74.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	95.9%	ICU Level of Service	F
Analysis Period (min)	15		











c Critical Lane Group

Timings

2: City Park Road & FM 2222

Champions Tract #3 TIA

2016 Build Out Conditions - PM Peak

					
Lane Group	NBL	NBR	SET	NWL	NWT
Lane Configurations					
Traffic Volume (vph)	253	467	1934	360	2667
Future Volume (vph)	253	467	1934	360	2667
Lane Group Flow (vph)	294	640	2166	391	2807
Turn Type	Prot	pt+ov	NA	pm+pt	NA
Protected Phases	4	4 5	6	5	2
Permitted Phases				2	
Detector Phase	4	4 5	6	5	2
Switch Phase					
Minimum Initial (s)	12.0		25.0	10.0	25.0
Minimum Split (s)	20.0		32.0	17.0	32.0
Total Split (s)	20.0		95.0	35.0	130.0
Total Split (%)	13.3%		63.3%	23.3%	86.7%
Yellow Time (s)	4.0		5.0	5.0	5.0
All-Red Time (s)	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0		7.0	7.0	7.0
Lead/Lag			Lead	Lag	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None		None	None	C-Max
v/c Ratio	0.92	1.23	1.05	1.03	0.97
Control Delay	100.0	159.8	55.9	101.7	28.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	100.0	159.8	55.9	101.7	28.7
Queue Length 50th (ft)	149	~766	~1217	~353	1099
Queue Length 95th (ft)	#221	#717	#1326	#567	#1178
Internal Link Dist (ft)	664		1418		595
Turn Bay Length (ft)	500	500		215	
Base Capacity (vph)	320	522	2065	379	2901
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.92	1.23	1.05	1.03	0.97

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:NWTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.












Splits and Phases: 2: City Park Road & FM 2222



HCM Signalized Intersection Capacity Analysis

2: City Park Road & FM 2222

Champions Tract #3 TIA
2016 Build Out Conditions - PM Peak

						
Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Traffic Volume (vph)	253	467	1934	54	360	2667
Future Volume (vph)	253	467	1934	54	360	2667
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	7.0		7.0	7.0
Lane Util. Factor	0.97	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	1583	3518		1770	3539
Flt Permitted	0.95	1.00	1.00		0.04	1.00
Satd. Flow (perm)	3433	1583	3518		78	3539
Peak-hour factor, PHF	0.86	0.73	0.93	0.63	0.92	0.95
Adj. Flow (vph)	294	640	2080	86	391	2807
RTOR Reduction (vph)	0	6	2	0	0	0
Lane Group Flow (vph)	294	634	2164	0	391	2807
Turn Type	Prot	pt+ov	NA		pm+pt	NA
Protected Phases	4	4 5	6		5	2
Permitted Phases					2	
Actuated Green, G (s)	14.0	49.0	88.0		123.0	123.0
Effective Green, g (s)	14.0	42.0	88.0		123.0	123.0
Actuated g/C Ratio	0.09	0.28	0.59		0.82	0.82
Clearance Time (s)	6.0		7.0		7.0	7.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	320	443	2063		379	2901
v/s Ratio Prot	0.09	c0.40	0.62		0.19	0.79
v/s Ratio Perm					c0.65	
v/c Ratio	0.92	1.43	1.05		1.03	0.97
Uniform Delay, d1	67.4	54.0	31.0		56.3	11.8
Progression Factor	1.00	1.00	0.77		1.12	1.75
Incremental Delay, d2	29.9	206.9	31.5		45.7	7.9
Delay (s)	97.4	260.9	55.3		108.6	28.4
Level of Service	F	F	E		F	C
Approach Delay (s)	209.4		55.3			38.2
Approach LOS	F		E			D
Intersection Summary						
HCM 2000 Control Delay			69.5		HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio			1.19			
Actuated Cycle Length (s)			150.0		Sum of lost time (s)	20.0
Intersection Capacity Utilization			101.8%		ICU Level of Service	G
Analysis Period (min)			15			
c Critical Lane Group						

Intersection

Int Delay, s/veh 448.3

Movement	SEL	SET	NWT	NWR	SWL	SWR
Traffic Vol, veh/h	38	2271	3126	92	127	65
Future Vol, veh/h	38	2271	3126	92	127	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	78	89	96	75	63	48
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	49	2552	3256	123	202	135

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	3379	0	4691
Stage 1	-	-	3318
Stage 2	-	-	1373
Critical Hdwy	4.14	-	6.84
Critical Hdwy Stg 1	-	-	5.84
Critical Hdwy Stg 2	-	-	5.84
Follow-up Hdwy	2.22	-	3.52
Pot Cap-1 Maneuver	79	-	~ 1
Stage 1	-	-	~ 16
Stage 2	-	-	~ 200
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	79	-	0
Mov Cap-2 Maneuver	-	-	~ 12
Stage 1	-	-	~ 16
Stage 2	-	-	~ 76

Approach	SE	NW	SW
HCM Control Delay, s	2	0	\$ 8386.1
HCM LOS			F

Minor Lane/Major Mvmt	NWT	NWR	SEL	SETSWLn1
Capacity (veh/h)	-	-	79	- 18
HCM Lane V/C Ratio	-	-	0.617	-18.722
HCM Control Delay (s)	-	-	106	\$ 8386.1
HCM Lane LOS	-	-	F	- F
HCM 95th %tile Q(veh)	-	-	2.8	- 42.8

Notes

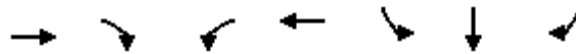
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Timings

Champions Tract #3 TIA

4: Loop 360 SB & FM 2222

2016 Build Out Conditions - PM Peak



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR	ø1	ø2	ø4	ø5	ø6
Lane Configurations	↑↑↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑					
Traffic Volume (vph)	1796	602	399	2222	200	37	1115					
Future Volume (vph)	1796	602	399	2222	200	37	1115					
Lane Group Flow (vph)	1891	708	464	2267	182	191	1225					
Turn Type	NA	Free	pm+pt	NA	Split	NA	Free					
Protected Phases	1 2		6 7	1 2 6 7	4 5	4 5		1	2	4	5	6
Permitted Phases		Free	1 2 6 7				Free					
Detector Phase	1 2		6 7	1 2 6 7	4 5	4 5						
Switch Phase												
Minimum Initial (s)								1.0	25.0	5.0	1.0	12.0
Minimum Split (s)								7.0	31.0	11.0	8.0	22.0
Total Split (s)								8.0	35.0	14.0	8.0	57.0
Total Split (%)								5%	23%	9%	5%	38%
Yellow Time (s)								4.0	4.0	4.0	4.0	4.0
All-Red Time (s)								2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag								Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?								Yes	Yes	Yes	Yes	Yes
Recall Mode								None	C-Max	None	None	None
v/c Ratio	1.20	0.45	0.47	0.79	1.02	1.03	0.77					
Control Delay	143.4	0.3	4.3	6.9	136.0	136.9	3.8					
Queue Delay	0.4	0.0	2.7	47.3	0.0	0.0	0.0					
Total Delay	143.8	0.3	7.0	54.2	136.0	136.9	3.8					
Queue Length 50th (ft)	~656	0	50	879	~196	~208	0					
Queue Length 95th (ft)	m#587	m0	m43	m0	#362	74	0					
Internal Link Dist (ft)	712			342		1059						
Turn Bay Length (ft)												
Base Capacity (vph)	1580	1583	981	2878	179	186	1583					
Starvation Cap Reductn	0	0	390	1023	0	0	0					
Spillback Cap Reductn	173	0	0	0	0	0	0					
Storage Cap Reductn	0	0	0	0	0	0	0					
Reduced v/c Ratio	1.34	0.45	0.79	1.22	1.02	1.03	0.77					

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green

Natural Cycle: 125

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

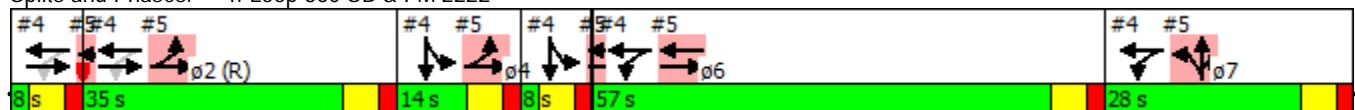
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Loop 360 SB & FM 2222



Kimley-Horn

Synchro 9 Report

Timings

4: Loop 360 SB & FM 2222

Champions Tract #3 TIA

2016 Build Out Conditions - PM Peak

Lane Group	ø7
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	7
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	9.0
Minimum Split (s)	15.0
Total Split (s)	28.0
Total Split (%)	19%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Recall Mode	None
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

4: Loop 360 SB & FM 2222

2016 Build Out Conditions - PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↗	↖	↑↑					↘	↗	↖
Traffic Volume (vph)	0	1796	602	399	2222	0	0	0	0	200	37	1115
Future Volume (vph)	0	1796	602	399	2222	0	0	0	0	200	37	1115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0	6.0	4.0
Lane Util. Factor		0.86	1.00	1.00	0.95					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		6408	1583	1770	3539					1681	1750	1583
Flt Permitted		1.00	1.00	0.11	1.00					0.95	0.99	1.00
Satd. Flow (perm)		6408	1583	201	3539					1681	1750	1583
Peak-hour factor, PHF	0.92	0.95	0.85	0.86	0.98	0.92	0.92	0.92	0.92	0.89	0.25	0.91
Adj. Flow (vph)	0	1891	708	464	2267	0	0	0	0	225	148	1225
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1891	708	464	2267	0	0	0	0	182	191	1225
Turn Type		NA	Free	pm+pt	NA					Split	NA	Free
Protected Phases		1 2		6 7	1 2 6 7					4 5	4 5	
Permitted Phases			Free	1 2 6 7								Free
Actuated Green, G (s)		37.0	150.0	116.0	122.0					16.0	16.0	150.0
Effective Green, g (s)		37.0	150.0	116.0	122.0					16.0	16.0	150.0
Actuated g/C Ratio		0.25	1.00	0.77	0.81					0.11	0.11	1.00
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)		1580	1583	981	2878					179	186	1583
v/s Ratio Prot		c0.30		0.25	c0.64					0.11	c0.11	
v/s Ratio Perm			0.45	0.12								c0.77
v/c Ratio		1.20	0.45	0.47	0.79					1.02	1.03	0.77
Uniform Delay, d1		56.5	0.0	16.5	7.3					67.0	67.0	0.0
Progression Factor		1.13	1.00	0.26	0.88					1.00	1.00	1.00
Incremental Delay, d2		90.8	0.3	0.0	0.1					71.7	73.2	3.8
Delay (s)		154.5	0.3	4.4	6.6					138.7	140.2	3.8
Level of Service		F	A	A	A					F	F	A
Approach Delay (s)		112.5			6.2			0.0			35.4	
Approach LOS		F			A			A			D	

Intersection Summary

HCM 2000 Control Delay	52.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	36.0
Intersection Capacity Utilization	114.8%	ICU Level of Service	H
Analysis Period (min)	15		

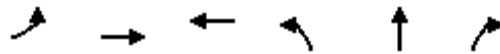
c Critical Lane Group

Timings

Champions Tract #3 TIA

5: Loop 360 NB & FM 2222

2016 Build Out Conditions - PM Peak



Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	ø1	ø2	ø4	ø5	ø6	ø7
Lane Configurations	↔↔	↑↑	↑↑↑↔	↔	↔	↔						
Traffic Volume (vph)	892	1099	1888	737	41	568						
Future Volume (vph)	892	1099	1888	737	41	568						
Lane Group Flow (vph)	980	1182	2052	425	431	701						
Turn Type	Prot	NA	NA	Split	NA	Prot						
Protected Phases	2 4	2 4 5 6	5 6	1 7	1 7	1 7	1	2	4	5	6	7
Permitted Phases												
Detector Phase	2 4	2 4 5 6	5 6	1 7	1 7	1 7						
Switch Phase												
Minimum Initial (s)							1.0	25.0	5.0	1.0	12.0	9.0
Minimum Split (s)							7.0	31.0	11.0	8.0	22.0	15.0
Total Split (s)							8.0	35.0	14.0	8.0	57.0	28.0
Total Split (%)							5%	23%	9%	5%	38%	19%
Yellow Time (s)							4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)							2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag							Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode							None	C-Max	None	None	None	None
v/c Ratio	1.00	0.46	1.03	1.26	1.27	1.60						
Control Delay	25.3	5.5	61.0	188.1	190.3	308.5						
Queue Delay	36.7	50.3	27.4	0.0	0.0	0.1						
Total Delay	62.0	55.8	88.4	188.1	190.3	308.6						
Queue Length 50th (ft)	520	574	~771	~548	~557	~856						
Queue Length 95th (ft)	m48	m3	#866	#776	#596	#937						
Internal Link Dist (ft)		342	774		892							
Turn Bay Length (ft)												
Base Capacity (vph)	984	2548	1988	336	339	439						
Starvation Cap Reductn	188	1587	0	0	0	0						
Spillback Cap Reductn	0	157	134	0	0	6						
Storage Cap Reductn	0	0	0	0	0	0						
Reduced v/c Ratio	1.23	1.23	1.11	1.26	1.27	1.62						

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green

Natural Cycle: 125

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

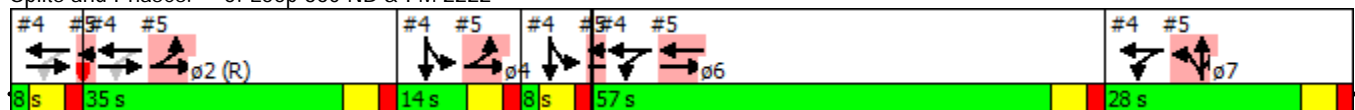
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Loop 360 NB & FM 2222



Kimley-Horn

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis

5: Loop 360 NB & FM 2222

Champions Tract #3 TIA
2016 Build Out Conditions - PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↕			↕↕↕		↔	↕	↔			
Traffic Volume (vph)	892	1099	0	0	1888	56	737	41	568	0	0	0
Future Volume (vph)	892	1099	0	0	1888	56	737	41	568	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.95	0.95	1.00			
Frt	1.00	1.00			0.99		1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00		0.95	0.96	1.00			
Satd. Flow (prot)	3433	3539			5046		1681	1696	1583			
Flt Permitted	0.95	1.00			1.00		0.95	0.96	1.00			
Satd. Flow (perm)	3433	3539			5046		1681	1696	1583			
Peak-hour factor, PHF	0.91	0.93	0.92	0.92	0.97	0.53	0.92	0.75	0.81	0.92	0.92	0.92
Adj. Flow (vph)	980	1182	0	0	1946	106	801	55	701	0	0	0
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	122	0	0	0
Lane Group Flow (vph)	980	1182	0	0	2048	0	425	431	579	0	0	0
Turn Type	Prot	NA			NA		Split	NA	Prot			
Protected Phases	2 4	2 4 5 6			5 6		1 7	1 7	1 7			
Permitted Phases												
Actuated Green, G (s)	43.0	108.0			59.0		30.0	30.0	30.0			
Effective Green, g (s)	43.0	108.0			59.0		30.0	30.0	30.0			
Actuated g/C Ratio	0.29	0.72			0.39		0.20	0.20	0.20			
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)	984	2548			1984		336	339	316			
v/s Ratio Prot	c0.29	0.33			c0.41		0.25	0.25	c0.37			
v/s Ratio Perm												
v/c Ratio	1.00	0.46			1.03		1.26	1.27	1.83			
Uniform Delay, d1	53.4	8.8			45.5		60.0	60.0	60.0			
Progression Factor	0.29	0.61			0.86		1.00	1.00	1.00			
Incremental Delay, d2	7.7	0.0			22.8		140.8	143.3	386.1			
Delay (s)	23.1	5.4			61.9		200.8	203.3	446.1			
Level of Service	C	A			E		F	F	F			
Approach Delay (s)		13.4			61.9			312.0			0.0	
Approach LOS		B			E			F			A	

Intersection Summary

HCM 2000 Control Delay	111.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.39		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	36.0
Intersection Capacity Utilization	114.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Timings

6: FM 2222 & Lakewood Dr

Champions Tract #3 TIA

2016 Build Out Conditions - PM Peak



Lane Group	EBL	EBT	WBT	SBL
Lane Configurations				
Traffic Volume (vph)	216	1577	1740	21
Future Volume (vph)	216	1577	1740	21
Lane Group Flow (vph)	284	1752	1980	188
Turn Type	pm+pt	NA	NA	Prot
Protected Phases	5	2	6	8
Permitted Phases	2			
Detector Phase	5	2	6	8
Switch Phase				
Minimum Initial (s)	5.0	25.0	25.0	5.0
Minimum Split (s)	12.0	32.0	32.0	22.0
Total Split (s)	25.0	125.0	100.0	25.0
Total Split (%)	16.7%	83.3%	66.7%	16.7%
Yellow Time (s)	5.0	5.0	5.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	6.0
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?	Yes		Yes	
Recall Mode	None	C-Min	C-Min	None
v/c Ratio	0.80	0.59	0.91	0.76
Control Delay	50.1	11.6	32.5	42.3
Queue Delay	0.0	0.2	0.0	0.0
Total Delay	50.1	11.9	32.5	42.3
Queue Length 50th (ft)	177	753	841	56
Queue Length 95th (ft)	m#223	m705	973	56
Internal Link Dist (ft)		774	667	639
Turn Bay Length (ft)	200			
Base Capacity (vph)	353	2958	2185	320
Starvation Cap Reductn	0	457	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.80	0.70	0.91	0.59

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 48 (32%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 110

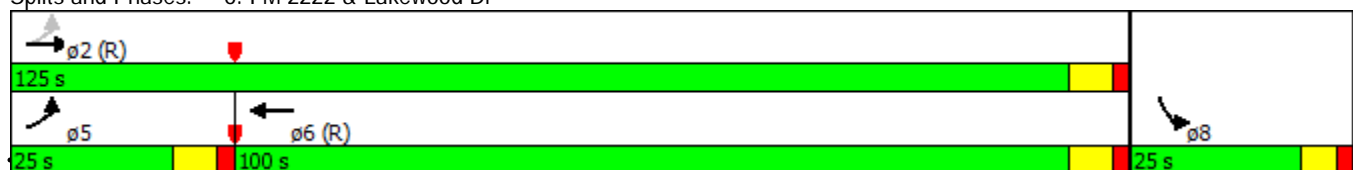
Control Type: Actuated-Coordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: FM 2222 & Lakewood Dr



Kimley-Horn

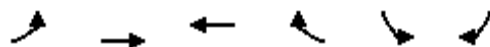
Synchro 9 Report

HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

6: FM 2222 & Lakewood Dr

2016 Build Out Conditions - PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	216	1577	1740	58	21	135
Future Volume (vph)	216	1577	1740	58	21	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0		6.0	
Lane Util. Factor	1.00	0.95	0.95		1.00	
Frt	1.00	1.00	0.99		0.89	
Flt Protected	0.95	1.00	1.00		0.99	
Satd. Flow (prot)	1770	3539	3521		1641	
Flt Permitted	0.04	1.00	1.00		0.99	
Satd. Flow (perm)	75	3539	3521		1641	
Peak-hour factor, PHF	0.76	0.90	0.91	0.85	0.64	0.87
Adj. Flow (vph)	284	1752	1912	68	33	155
RTOR Reduction (vph)	0	0	2	0	119	0
Lane Group Flow (vph)	284	1752	1978	0	69	0
Turn Type	pm+pt	NA	NA		Prot	
Protected Phases	5	2	6		8	
Permitted Phases	2					
Actuated Green, G (s)	125.4	125.4	92.7		11.6	
Effective Green, g (s)	125.4	125.4	92.7		11.6	
Actuated g/C Ratio	0.84	0.84	0.62		0.08	
Clearance Time (s)	7.0	7.0	7.0		6.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	353	2958	2175		126	
v/s Ratio Prot	c0.14	0.50	c0.56		c0.04	
v/s Ratio Perm	0.54					
v/c Ratio	0.80	0.59	0.91		0.55	
Uniform Delay, d1	51.5	4.0	25.0		66.7	
Progression Factor	0.87	2.44	1.00		1.00	
Incremental Delay, d2	7.2	0.5	7.1		4.8	
Delay (s)	52.0	10.2	32.1		71.5	
Level of Service	D	B	C		E	
Approach Delay (s)		16.1	32.1		71.5	
Approach LOS		B	C		E	

Intersection Summary

HCM 2000 Control Delay	26.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	88.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection

Int Delay, s/veh 52

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	0	159	0	0	2705	91
Future Vol, veh/h	0	159	0	0	2705	91
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	63	92	92	94	67
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	252	0	0	2878	136

Major/Minor	Minor2	Major2
Conflicting Flow All	2946	1506
Stage 1	2946	-
Stage 2	0	-
Critical Hdwy	7.54	6.94
Critical Hdwy Stg 1	6.54	-
Critical Hdwy Stg 2	-	-
Follow-up Hdwy	3.52	3.32
Pot Cap-1 Maneuver	7	~ 110
Stage 1	15	-
Stage 2	-	-
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	7	~ 110
Mov Cap-2 Maneuver	7	-
Stage 1	15	-
Stage 2	-	-

Approach	EB	SB
HCM Control Delay, s	\$ 673.4	0
HCM LOS	F	

Minor Lane/Major Mvmt	EBLn1	SBT	SBR
Capacity (veh/h)	110	-	-
HCM Lane V/C Ratio	2.294	-	-
HCM Control Delay (s)	\$ 673.4	-	-
HCM Lane LOS	F	-	-
HCM 95th %tile Q(veh)	22.1	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	0	58	0	3163	2251	17
Future Vol, veh/h	0	58	0	3163	2251	17
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	-	-	-	-
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	63	0	3438	2447	18

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	4175	1233	2465	0	-	0
Stage 1	2456	-	-	-	-	-
Stage 2	1719	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	2	169	185	-	-	-
Stage 1	50	-	-	-	-	-
Stage 2	130	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	2	169	185	-	-	-
Mov Cap-2 Maneuver	34	-	-	-	-	-
Stage 1	50	-	-	-	-	-
Stage 2	130	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	38.5	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	185	-	169	-	-
HCM Lane V/C Ratio	-	-	0.373	-	-
HCM Control Delay (s)	0	-	38.5	-	-
HCM Lane LOS	A	-	E	-	-
HCM 95th %tile Q(veh)	0	-	1.6	-	-

Intersection

Int Delay, s/veh 1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	712	3	109	305	1	9
Future Vol, veh/h	712	3	109	305	1	9
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	774	3	118	332	1	10

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	1344
Stage 1	-	-	776
Stage 2	-	-	568
Critical Hdwy	-	4.12	6.42
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	-	2.218	3.518
Pot Cap-1 Maneuver	-	839	167
Stage 1	-	-	454
Stage 2	-	-	567
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	839	138
Mov Cap-2 Maneuver	-	-	138
Stage 1	-	-	454
Stage 2	-	-	469

Approach	EB	WB	NB
HCM Control Delay, s	0	2.6	16.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	334	-	-	839	-
HCM Lane V/C Ratio	0.033	-	-	0.141	-
HCM Control Delay (s)	16.1	-	-	10	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.5	-

Appendix G: Synchro Reports – Mitigations

Item C-01





















143 of 168

Timings

Champions Tract #3 TIA

1: Jester Blvd & FM 2222

2016 Build Out Conditions Mitigated - AM Peak

										
Lane Group	NBL	NBT	NBR	SBL	SBT	NEL	NET	SWL	SWT	SWR
Lane Configurations										
Traffic Volume (vph)	7	1316	100	41	2809	6	2	186	1	7
Future Volume (vph)	7	1316	100	41	2809	6	2	186	1	7
Lane Group Flow (vph)	9	1415	147	68	2992	14	120	121	121	18
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	5	2		1	6	7	4	3	8	
Permitted Phases	2		2	6		4	4	8		8
Detector Phase	5	2	2	1	6	7	4	3	8	8
Switch Phase										
Minimum Initial (s)	5.0	25.0	25.0	5.0	25.0	5.0	5.0	8.0	8.0	8.0
Minimum Split (s)	11.0	32.0	32.0	11.0	32.0	11.0	11.0	14.0	39.0	39.0
Total Split (s)	15.0	101.0	101.0	11.0	97.0	16.0	16.0	22.0	22.0	22.0
Total Split (%)	10.0%	67.3%	67.3%	7.3%	64.7%	10.7%	10.7%	14.7%	14.7%	14.7%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	7.0	7.0	6.0	7.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	None	None	None	None	None
v/c Ratio	0.07	0.61	0.14	0.32	1.21	0.13	0.79	0.58	0.58	0.05
Control Delay	4.4	5.7	0.7	10.5	121.2	68.7	69.8	71.1	71.1	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.4	5.7	0.7	10.5	121.2	68.7	69.8	71.1	71.1	0.3
Queue Length 50th (ft)	1	108	0	19	~1872	13	60	106	106	0
Queue Length 95th (ft)	m2	167	0	22	#2130	17	44	170	51	0
Internal Link Dist (ft)		362			394		655		292	
Turn Bay Length (ft)	215		180	225		150				
Base Capacity (vph)	158	2320	1075	214	2478	131	160	218	208	342
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.61	0.14	0.32	1.21	0.11	0.75	0.56	0.58	0.05

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

- ~ Volume exceeds capacity, queue is theoretically infinite.


Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Jester Blvd & FM 2222


























 ϕ_1	 ϕ_2 (R)	 ϕ_3	 ϕ_4
11 s	101 s	22 s	16 s
 ϕ_5	 ϕ_6 (R)	 ϕ_8	 ϕ_7
15 s	97 s	22 s	16 s

HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

1: Jester Blvd & FM 2222

2016 Build Out Conditions Mitigated - AM Peak

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		 			 						 	
Traffic Volume (vph)	7	1316	100	41	2809	1	6	2	93	186	1	7
Future Volume (vph)	7	1316	100	41	2809	1	6	2	93	186	1	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	7.0	7.0	6.0	7.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	0.95	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539		1770	1593		1681	1688	1583
Flt Permitted	0.04	1.00	1.00	0.12	1.00		0.68	1.00		0.46	0.45	1.00
Satd. Flow (perm)	80	3539	1583	221	3539		1258	1593		814	800	1583
Peak-hour factor, PHF	0.75	0.93	0.68	0.60	0.94	0.25	0.42	0.50	0.80	0.78	0.25	0.38
Adj. Flow (vph)	9	1415	147	68	2988	4	14	4	116	238	4	18
RTOR Reduction (vph)	0	0	41	0	0	0	0	53	0	0	0	15
Lane Group Flow (vph)	9	1415	106	68	2992	0	14	67	0	121	121	3
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6			4	4		8		8
Actuated Green, G (s)	94.8	93.6	93.6	101.0	96.7		12.7	12.7		23.1	23.1	23.1
Effective Green, g (s)	94.8	93.6	93.6	101.0	96.7		12.7	12.7		23.1	23.1	23.1
Actuated g/C Ratio	0.63	0.62	0.62	0.67	0.64		0.08	0.08		0.15	0.15	0.15
Clearance Time (s)	6.0	7.0	7.0	6.0	7.0		6.0	6.0		6.0	6.0	6.0
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)	64	2208	987	193	2281		120	134		208	208	243
v/s Ratio Prot	0.00	0.40		c0.01	c0.85		0.00	c0.04		c0.06	0.06	
v/s Ratio Perm	0.09		0.07	0.23			0.01			0.03	0.03	0.00
v/c Ratio	0.14	0.64	0.11	0.35	1.31		0.12	0.50		0.58	0.58	0.01
Uniform Delay, d1	37.1	17.7	11.4	13.6	26.6		63.5	65.6		57.9	59.0	53.8
Progression Factor	0.53	0.30	0.15	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.8	1.1	0.2	1.1	143.5		0.4	2.9		4.1	4.1	0.0
Delay (s)	20.5	6.4	1.9	14.8	170.2		64.0	68.5		62.0	63.1	53.8
Level of Service	C	A	A	B	F		E	E		E	E	D
Approach Delay (s)		6.1			166.7			68.0			61.9	
Approach LOS		A			F			E			E	

Intersection Summary

HCM 2000 Control Delay	108.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	100.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Timings

2: City Park Road & FM 2222

Champions Tract #3 TIA

2016 Build Out Conditions Mitigated - AM Peak



Lane Group	NBL	NBR	SET	NWL	NWT
Lane Configurations					
Traffic Volume (vph)	58	350	2897	236	1570
Future Volume (vph)	58	350	2897	236	1570
Lane Group Flow (vph)	72	389	3354	299	1670
Turn Type	Prot	pt+ov	NA	pm+pt	NA
Protected Phases	4	4 5	6	5	2
Permitted Phases				2	
Detector Phase	4	4 5	6	5	2
Switch Phase					
Minimum Initial (s)	12.0		20.0	5.0	20.0
Minimum Split (s)	20.0		29.0	14.0	29.0
Total Split (s)	32.0		94.0	24.0	118.0
Total Split (%)	21.3%		62.7%	16.0%	78.7%
Yellow Time (s)	4.0		5.0	5.0	5.0
All-Red Time (s)	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0		7.0	7.0	7.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None		None	None	C-Max
v/c Ratio	0.12	0.74	1.65	1.19	0.64
Control Delay	53.1	53.8	315.3	150.1	24.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	53.1	53.8	315.3	150.1	24.4
Queue Length 50th (ft)	30	336	~2503	~303	785
Queue Length 95th (ft)	49	466	m#1952	#393	861
Internal Link Dist (ft)	664		1418		595
Turn Bay Length (ft)	500	500		215	
Base Capacity (vph)	595	516	2027	251	2620
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.12	0.75	1.65	1.19	0.64

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:NWTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.












Splits and Phases: 2: City Park Road & FM 2222



HCM Signalized Intersection Capacity Analysis

2: City Park Road & FM 2222

Champions Tract #3 TIA
2016 Build Out Conditions Mitigated - AM Peak

						
Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Traffic Volume (vph)	58	350	2897	272	236	1570
Future Volume (vph)	58	350	2897	272	236	1570
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	7.0		7.0	7.0
Lane Util. Factor	0.97	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	1583	3486		1770	3539
Flt Permitted	0.95	1.00	1.00		0.04	1.00
Satd. Flow (perm)	3433	1583	3486		79	3539
Peak-hour factor, PHF	0.81	0.90	0.96	0.81	0.79	0.94
Adj. Flow (vph)	72	389	3018	336	299	1670
RTOR Reduction (vph)	0	1	5	0	0	0
Lane Group Flow (vph)	72	388	3349	0	299	1670
Turn Type	Prot	pt+ov	NA		pm+pt	NA
Protected Phases	4	4 5	6		5	2
Permitted Phases					2	
Actuated Green, G (s)	25.9	49.0	87.0		111.1	111.1
Effective Green, g (s)	25.9	49.0	87.0		111.1	111.1
Actuated g/C Ratio	0.17	0.33	0.58		0.74	0.74
Clearance Time (s)	6.0		7.0		7.0	7.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	592	517	2021		251	2621
v/s Ratio Prot	0.02	c0.25	c0.96		c0.14	0.47
v/s Ratio Perm					0.74	
v/c Ratio	0.12	0.75	1.66		1.19	0.64
Uniform Delay, d1	52.4	45.1	31.5		56.6	9.6
Progression Factor	1.00	1.00	0.54		0.78	2.39
Incremental Delay, d2	0.1	6.1	295.8		116.0	1.1
Delay (s)	52.5	51.1	312.7		160.3	23.9
Level of Service	D	D	F		F	C
Approach Delay (s)	51.4		312.7			44.7
Approach LOS	D		F			D
Intersection Summary						
HCM 2000 Control Delay			200.6		HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio			1.44			
Actuated Cycle Length (s)			150.0		Sum of lost time (s)	20.0
Intersection Capacity Utilization			128.5%		ICU Level of Service	H
Analysis Period (min)			15			
c Critical Lane Group						

Intersection

Int Delay, s/veh 35.4

Movement	SEL	SET	NWT	NWR	SWL	SWR
Traffic Vol, veh/h	55	3239	1841	175	78	38
Future Vol, veh/h	55	3239	1841	175	78	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	44	95	93	63	87	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	125	3409	1980	278	90	45

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	2257	0	4073
Stage 1	-	-	2118
Stage 2	-	-	1955
Critical Hdwy	4.14	-	6.84
Critical Hdwy Stg 1	-	-	5.84
Critical Hdwy Stg 2	-	-	5.84
Follow-up Hdwy	2.22	-	3.52
Pot Cap-1 Maneuver	224	-	~ 2
Stage 1	-	-	~ 78
Stage 2	-	-	96
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	224	-	~ 1
Mov Cap-2 Maneuver	-	-	~ 25
Stage 1	-	-	~ 78
Stage 2	-	-	~ 42

Approach	SE	NW	SW
HCM Control Delay, s	1.4	0	\$ 1518.6
HCM LOS			F

Minor Lane/Major Mvmt	NWT	NWR	SEL	SETSWLn1
Capacity (veh/h)	-	-	224	- 35
HCM Lane V/C Ratio	-	-	0.558	- 3.854
HCM Control Delay (s)	-	-	39.6	\$ 1518.6
HCM Lane LOS	-	-	E	- F
HCM 95th %tile Q(veh)	-	-	3	- 15.7

Notes

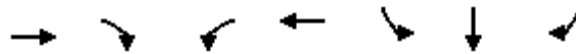
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Timings

Champions Tract #3 TIA

4: Loop 360 SB & FM 2222

2016 Build Out Conditions Mitigated - AM Peak



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR	ø1	ø2	ø4	ø5	ø6
Lane Configurations	↑↑↑↑	↑	↑	↑↑	↑	↑	↑					
Traffic Volume (vph)	2472	756	595	1294	220	108	654					
Future Volume (vph)	2472	756	595	1294	220	108	654					
Lane Group Flow (vph)	2687	796	620	1470	190	198	719					
Turn Type	NA	Free	D.P+P	NA	Split	NA	Free					
Protected Phases	1 2		6 7	1 2 6 7	4 5	4 5		1	2	4	5	6
Permitted Phases		Free	1 2				Free					
Detector Phase	1 2		6 7	1 2 6 7	4 5	4 5						
Switch Phase												
Minimum Initial (s)								1.0	25.0	5.0	1.0	12.0
Minimum Split (s)								7.0	31.0	11.0	8.0	22.0
Total Split (s)								8.0	61.0	14.0	8.0	41.0
Total Split (%)								5%	41%	9%	5%	27%
Yellow Time (s)								4.0	4.0	4.0	4.0	4.0
All-Red Time (s)								2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag								Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?								Yes	Yes	Yes	Yes	Yes
Recall Mode								Min	C-Max	Min	Min	Min
v/c Ratio	1.00	0.50	0.92	0.51	1.06	1.07	0.45					
Control Delay	64.9	0.1	21.6	2.6	146.0	147.1	0.9					
Queue Delay	6.1	0.0	46.6	49.2	0.0	0.0	0.0					
Total Delay	71.0	0.1	68.2	51.8	146.0	147.1	0.9					
Queue Length 50th (ft)	807	0	284	1	~214	~224	0					
Queue Length 95th (ft)	m523	m0	m103	m1	#368	#333	0					
Internal Link Dist (ft)	712			342		1059						
Turn Bay Length (ft)												
Base Capacity (vph)	2691	1583	674	2878	179	185	1583					
Starvation Cap Reductn	0	0	137	1636	0	0	0					
Spillback Cap Reductn	57	0	0	0	0	0	0					
Storage Cap Reductn	0	0	0	0	0	0	0					
Reduced v/c Ratio	1.02	0.50	1.15	1.18	1.06	1.07	0.45					

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

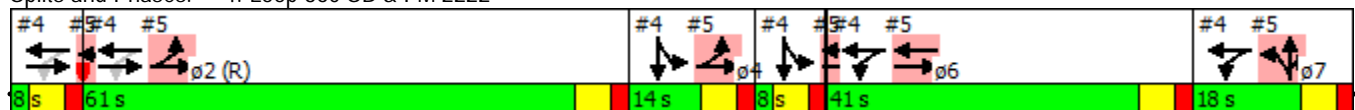
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Loop 360 SB & FM 2222



Kimley-Horn

Synchro 9 Report

Timings

4: Loop 360 SB & FM 2222

Champions Tract #3 TIA

2016 Build Out Conditions Mitigated - AM Peak

Lane Group	ø7
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	7
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	9.0
Minimum Split (s)	15.0
Total Split (s)	18.0
Total Split (%)	12%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Recall Mode	Min
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

4: Loop 360 SB & FM 2222

2016 Build Out Conditions Mitigated - AM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↗	↖	↑↑					↖	↗	↗
Traffic Volume (vph)	0	2472	756	595	1294	0	0	0	0	220	108	654
Future Volume (vph)	0	2472	756	595	1294	0	0	0	0	220	108	654
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0	6.0	4.0
Lane Util. Factor		0.86	1.00	1.00	0.95					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.98	1.00
Satd. Flow (prot)		6408	1583	1770	3539					1681	1742	1583
Flt Permitted		1.00	1.00	0.06	1.00					0.95	0.98	1.00
Satd. Flow (perm)		6408	1583	118	3539					1681	1742	1583
Peak-hour factor, PHF	0.92	0.92	0.95	0.96	0.88	0.92	0.92	0.92	0.92	0.87	0.80	0.91
Adj. Flow (vph)	0	2687	796	620	1470	0	0	0	0	253	135	719
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2687	796	620	1470	0	0	0	0	190	198	719
Turn Type		NA	Free	D.P+P	NA					Split	NA	Free
Protected Phases		1 2		6 7	1 2 6 7					4 5	4 5	
Permitted Phases			Free	1 2								Free
Actuated Green, G (s)		63.0	150.0	116.0	122.0					16.0	16.0	150.0
Effective Green, g (s)		63.0	150.0	116.0	122.0					16.0	16.0	150.0
Actuated g/C Ratio		0.42	1.00	0.77	0.81					0.11	0.11	1.00
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)		2691	1583	674	2878					179	185	1583
v/s Ratio Prot		c0.42		c0.32	0.42					0.11	c0.11	
v/s Ratio Perm			0.50	0.38								0.45
v/c Ratio		1.00	0.50	0.92	0.51					1.06	1.07	0.45
Uniform Delay, d1		43.5	0.0	41.5	4.5					67.0	67.0	0.0
Progression Factor		1.41	1.00	0.45	0.57					1.00	1.00	1.00
Incremental Delay, d2		4.8	0.1	2.2	0.0					84.5	86.1	0.9
Delay (s)		66.2	0.1	20.7	2.6					151.5	153.1	0.9
Level of Service		E	A	C	A					F	F	A
Approach Delay (s)		51.1			8.0			0.0			54.0	
Approach LOS		D			A			A			D	

Intersection Summary

HCM 2000 Control Delay	38.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	36.0
Intersection Capacity Utilization	92.7%	ICU Level of Service	F
Analysis Period (min)	15		

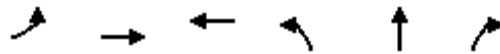
c Critical Lane Group

Timings

Champions Tract #3 TIA

5: Loop 360 NB & FM 2222

2016 Build Out Conditions Mitigated - AM Peak



Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	ø1	ø2	ø4	ø5	ø6	ø7
Lane Configurations	↔↔	↑↑	↑↑↑	↔	↔	↔						
Traffic Volume (vph)	1180	1507	1368	531	22	382						
Future Volume (vph)	1180	1507	1368	531	22	382						
Lane Group Flow (vph)	1297	1586	1632	306	303	478						
Turn Type	Prot	NA	NA	Split	NA	Prot						
Protected Phases	2 4	2 4 5 6	5 6	1 7	1 7	1 7	1	2	4	5	6	7
Permitted Phases												
Detector Phase	2 4	2 4 5 6	5 6	1 7	1 7	1 7						
Switch Phase												
Minimum Initial (s)							1.0	25.0	5.0	1.0	12.0	9.0
Minimum Split (s)							7.0	31.0	11.0	8.0	22.0	15.0
Total Split (s)							8.0	61.0	14.0	8.0	41.0	18.0
Total Split (%)							5%	41%	9%	5%	27%	12%
Yellow Time (s)							4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)							2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag							Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode							Min	C-Max	Min	Min	Min	Min
v/c Ratio	0.82	0.57	1.13	1.37	1.35	1.39						
Control Delay	8.8	2.2	121.1	237.0	229.6	224.7						
Queue Delay	13.9	17.4	0.2	0.0	0.0	0.0						
Total Delay	22.7	19.6	121.3	237.0	229.6	224.7						
Queue Length 50th (ft)	58	0	~689	~413	~406	~487						
Queue Length 95th (ft)	m56	m0	#780	#618	#402	#579						
Internal Link Dist (ft)		342	774		892							
Turn Bay Length (ft)												
Base Capacity (vph)	1579	2784	1446	224	225	343						
Starvation Cap Reductn	291	1228	0	0	0	0						
Spillback Cap Reductn	0	0	86	0	0	0						
Storage Cap Reductn	0	0	0	0	0	0						
Reduced v/c Ratio	1.01	1.02	1.20	1.37	1.35	1.39						

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

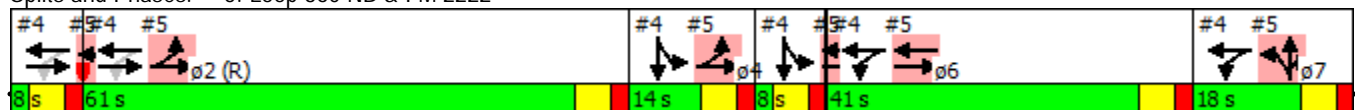
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Loop 360 NB & FM 2222



Kimley-Horn




















Synchro 9 Report

HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

5: Loop 360 NB & FM 2222

2016 Build Out Conditions Mitigated - AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1180	1507	0	0	1368	93	531	22	382	0	0	0
Future Volume (vph)	1180	1507	0	0	1368	93	531	22	382	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91		0.95	0.95	1.00			
Frt	1.00	1.00			0.99		1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00		0.95	0.96	1.00			
Satd. Flow (prot)	3433	3539			5025		1681	1694	1583			
Flt Permitted	0.95	1.00			1.00		0.95	0.96	1.00			
Satd. Flow (perm)	3433	3539			5025		1681	1694	1583			
Peak-hour factor, PHF	0.91	0.95	0.92	0.92	0.91	0.72	0.92	0.68	0.80	0.92	0.92	0.92
Adj. Flow (vph)	1297	1586	0	0	1503	129	577	32	478	0	0	0
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	133	0	0	0
Lane Group Flow (vph)	1297	1586	0	0	1626	0	306	303	345	0	0	0
Turn Type	Prot	NA			NA		Split	NA	Prot			
Protected Phases	2 4	2 4 5 6			5 6		1 7	1 7	1 7			
Permitted Phases												
Actuated Green, G (s)	69.0	118.0			43.0		20.0	20.0	20.0			
Effective Green, g (s)	69.0	118.0			43.0		20.0	20.0	20.0			
Actuated g/C Ratio	0.46	0.79			0.29		0.13	0.13	0.13			
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)	1579	2784			1440		224	225	211			
v/s Ratio Prot	c0.38	0.45			c0.32		0.18	0.18	c0.22			
v/s Ratio Perm												
v/c Ratio	0.82	0.57			1.13		1.37	1.35	1.64			
Uniform Delay, d1	35.2	6.2			53.5		65.0	65.0	65.0			
Progression Factor	0.23	0.33			1.18		1.00	1.00	1.00			
Incremental Delay, d2	0.3	0.0			66.3		190.6	182.6	307.1			
Delay (s)	8.5	2.1			129.2		255.6	247.6	372.1			
Level of Service	A	A			F		F	F	F			
Approach Delay (s)		5.0			129.2			304.6			0.0	
Approach LOS		A			F			F			A	
Intersection Summary												
HCM 2000 Control Delay			99.3				HCM 2000 Level of Service			F		
HCM 2000 Volume to Capacity ratio			1.21									
Actuated Cycle Length (s)			150.0				Sum of lost time (s)			36.0		
Intersection Capacity Utilization			92.7%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												

Timings

6: FM 2222 & Lakewood Dr

Champions Tract #3 TIA

2016 Build Out Conditions Mitigated - AM Peak



Lane Group	EBL	EBT	WBT	SBL
Lane Configurations				
Traffic Volume (vph)	72	1821	1269	9
Future Volume (vph)	72	1821	1269	9
Lane Group Flow (vph)	96	1877	1460	156
Turn Type	pm+pt	NA	NA	Prot
Protected Phases	5	2	6	8
Permitted Phases	2			
Detector Phase	5	2	6	8
Switch Phase				
Minimum Initial (s)	5.0	25.0	25.0	5.0
Minimum Split (s)	12.0	32.0	32.0	22.0
Total Split (s)	20.0	125.0	105.0	25.0
Total Split (%)	13.3%	83.3%	70.0%	16.7%
Yellow Time (s)	5.0	5.0	5.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	6.0
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?	Yes		Yes	
Recall Mode	None	C-Min	C-Min	None
v/c Ratio	0.33	0.62	0.54	0.69
Control Delay	2.4	1.4	8.3	28.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	2.4	1.4	8.3	28.6
Queue Length 50th (ft)	6	62	248	12
Queue Length 95th (ft)	m2	m15	372	27
Internal Link Dist (ft)		774	667	639
Turn Bay Length (ft)	200			
Base Capacity (vph)	357	3033	2704	330
Starvation Cap Reductn	0	88	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.27	0.64	0.54	0.47

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 48 (32%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: FM 2222 & Lakewood Dr

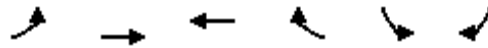


HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

6: FM 2222 & Lakewood Dr

2016 Build Out Conditions Mitigated - AM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	72	1821	1269	8	9	124
Future Volume (vph)	72	1821	1269	8	9	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0		6.0	
Lane Util. Factor	1.00	0.95	0.95		1.00	
Frt	1.00	1.00	1.00		0.88	
Flt Protected	0.95	1.00	1.00		1.00	
Satd. Flow (prot)	1770	3539	3533		1625	
Flt Permitted	0.14	1.00	1.00		1.00	
Satd. Flow (perm)	264	3539	3533		1625	
Peak-hour factor, PHF	0.75	0.97	0.88	0.44	0.67	0.87
Adj. Flow (vph)	96	1877	1442	18	13	143
RTOR Reduction (vph)	0	0	0	0	135	0
Lane Group Flow (vph)	96	1877	1460	0	21	0
Turn Type	pm+pt	NA	NA		Prot	
Protected Phases	5	2	6		8	
Permitted Phases	2					
Actuated Green, G (s)	128.6	128.6	114.8		8.4	
Effective Green, g (s)	128.6	128.6	114.8		8.4	
Actuated g/C Ratio	0.86	0.86	0.77		0.06	
Clearance Time (s)	7.0	7.0	7.0		6.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	294	3034	2703		91	
v/s Ratio Prot	0.01	c0.53	0.41		c0.01	
v/s Ratio Perm	0.26					
v/c Ratio	0.33	0.62	0.54		0.23	
Uniform Delay, d1	4.8	3.3	7.0		67.7	
Progression Factor	0.31	0.21	1.00		1.00	
Incremental Delay, d2	0.4	0.6	0.8		1.3	
Delay (s)	1.9	1.3	7.8		69.0	
Level of Service	A	A	A		E	
Approach Delay (s)		1.3	7.8		69.0	
Approach LOS		A	A		E	

Intersection Summary

HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		





















c Critical Lane Group

Timings

Champions Tract #3 TIA

1: Jester Blvd & FM 2222

2016 Build Out Conditions Mitigated - PM Peak

										
Lane Group	NBL	NBT	NBR	SBL	SBT	NEL	NET	SWL	SWT	SWR
Lane Configurations										
Traffic Volume (vph)	60	2504	254	68	1429	5	8	316	7	18
Future Volume (vph)	60	2504	254	68	1429	5	8	316	7	18
Lane Group Flow (vph)	74	2608	306	92	1624	15	42	194	196	36
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	5	2		1	6	7	4	3	8	
Permitted Phases	2		2	6		4	4	8		8
Detector Phase	5	2	2	1	6	7	4	3	8	8
Switch Phase										
Minimum Initial (s)	5.0	25.0	25.0	5.0	25.0	6.0	5.0	8.0	8.0	8.0
Minimum Split (s)	11.0	32.0	32.0	11.0	32.0	12.0	11.0	14.0	39.0	39.0
Total Split (s)	16.0	101.0	101.0	11.0	96.0	14.0	14.0	24.0	24.0	24.0
Total Split (%)	10.7%	67.3%	67.3%	7.3%	64.0%	9.3%	9.3%	16.0%	16.0%	16.0%
Yellow Time (s)	4.0	5.0	5.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	7.0	7.0	6.0	7.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	None	None	None	None	None
v/c Ratio	0.42	1.15	0.29	0.73	0.73	0.19	0.42	0.78	0.79	0.11
Control Delay	9.9	94.5	8.9	57.0	21.9	73.6	44.9	81.5	82.3	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.9	94.5	8.9	57.0	21.9	73.6	44.9	81.5	82.3	0.6
Queue Length 50th (ft)	22	~1601	91	36	560	14	14	182	183	0
Queue Length 95th (ft)	m24	m#1657	m101	#92	679	14	26	#327	#278	0
Internal Link Dist (ft)		362			394		655		292	
Turn Bay Length (ft)	215		180	225		150				
Base Capacity (vph)	208	2271	1058	126	2239	94	115	249	248	339
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	1.15	0.29	0.73	0.73	0.16	0.37	0.78	0.79	0.11

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 139 (93%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

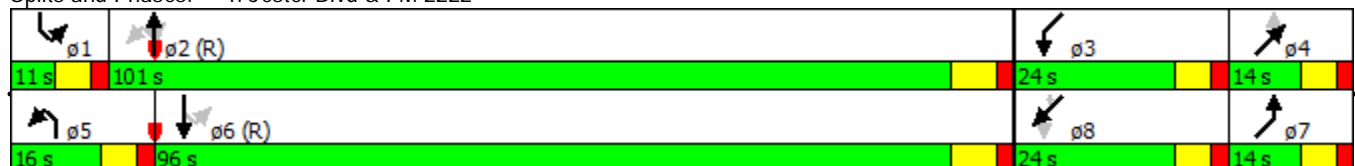
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Jester Blvd & FM 2222

























HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

1: Jester Blvd & FM 2222

2016 Build Out Conditions Mitigated - PM Peak

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	60	2504	254	68	1429	10	5	8	13	316	7	18
Future Volume (vph)	60	2504	254	68	1429	10	5	8	13	316	7	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	7.0	7.0	6.0	7.0		6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	0.95	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3533		1770	1676		1681	1689	1583
Flt Permitted	0.08	1.00	1.00	0.04	1.00		0.83	1.00		0.83	0.81	1.00
Satd. Flow (perm)	140	3539	1583	81	3533		1552	1676		1475	1441	1583
Peak-hour factor, PHF	0.81	0.96	0.83	0.74	0.89	0.56	0.33	0.58	0.46	0.83	0.75	0.50
Adj. Flow (vph)	74	2608	306	92	1606	18	15	14	28	381	9	36
RTOR Reduction (vph)	0	0	45	0	0	0	0	27	0	0	0	31
Lane Group Flow (vph)	74	2608	261	92	1624	0	15	15	0	194	196	5
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6			4	4		8		8
Actuated Green, G (s)	100.2	92.7	92.7	97.8	91.5		8.0	8.0		22.8	22.8	22.8
Effective Green, g (s)	100.2	92.7	92.7	97.8	91.5		8.0	8.0		22.8	22.8	22.8
Actuated g/C Ratio	0.67	0.62	0.62	0.65	0.61		0.05	0.05		0.15	0.15	0.15
Clearance Time (s)	6.0	7.0	7.0	6.0	7.0		6.0	6.0		6.0	6.0	6.0
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)	175	2187	978	123	2155		87	89		248	248	240
v/s Ratio Prot	0.02	c0.74		c0.03	0.46		0.00	c0.01		0.09	c0.09	
v/s Ratio Perm	0.26		0.17	0.45			0.01			0.02	0.03	0.00
v/c Ratio	0.42	1.19	0.27	0.75	0.75		0.17	0.17		0.78	0.79	0.02
Uniform Delay, d1	18.6	28.6	13.1	40.3	21.1		67.9	67.8		61.0	61.3	54.1
Progression Factor	1.19	0.95	1.18	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	88.1	0.2	21.7	2.5		0.9	0.9		14.8	15.6	0.0
Delay (s)	22.6	115.4	15.7	62.0	23.6		68.8	68.8		75.7	76.9	54.2
Level of Service	C	F	B	E	C		E	E		E	E	D
Approach Delay (s)		102.9			25.7			68.8			74.5	
Approach LOS		F			C			E			E	

Intersection Summary

HCM 2000 Control Delay	74.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	95.9%	ICU Level of Service	F
Analysis Period (min)	15		











c Critical Lane Group

Timings

2: City Park Road & FM 2222

Champions Tract #3 TIA

2016 Build Out Conditions Mitigated - PM Peak

					
Lane Group	NBL	NBR	SET	NWL	NWT
Lane Configurations					
Traffic Volume (vph)	253	467	1934	360	2667
Future Volume (vph)	253	467	1934	360	2667
Lane Group Flow (vph)	294	640	2166	391	2807
Turn Type	Prot	pt+ov	NA	pm+pt	NA
Protected Phases	4	4 5	6	5	2
Permitted Phases				2	
Detector Phase	4	4 5	6	5	2
Switch Phase					
Minimum Initial (s)	12.0		25.0	10.0	25.0
Minimum Split (s)	20.0		32.0	17.0	32.0
Total Split (s)	22.0		96.0	32.0	128.0
Total Split (%)	14.7%		64.0%	21.3%	85.3%
Yellow Time (s)	4.0		5.0	5.0	5.0
All-Red Time (s)	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0		7.0	7.0	7.0
Lead/Lag			Lead	Lag	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None		None	None	C-Max
v/c Ratio	0.80	1.25	1.04	1.14	0.98
Control Delay	82.3	169.5	52.0	136.7	34.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	82.3	169.5	52.0	136.7	34.3
Queue Length 50th (ft)	147	~775	~1204	~389	1201
Queue Length 95th (ft)	#197	#726	#1335	#603	#1575
Internal Link Dist (ft)	664		1418		595
Turn Bay Length (ft)	500	500		215	
Base Capacity (vph)	366	512	2089	344	2854
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.80	1.25	1.04	1.14	0.98

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 148 (99%), Referenced to phase 2:NWTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 2: City Park Road & FM 2222

















HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

2: City Park Road & FM 2222

2016 Build Out Conditions Mitigated - PM Peak

						
Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations	 		 			 
Traffic Volume (vph)	253	467	1934	54	360	2667
Future Volume (vph)	253	467	1934	54	360	2667
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	7.0		7.0	7.0
Lane Util. Factor	0.97	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	1583	3518		1770	3539
Flt Permitted	0.95	1.00	1.00		0.04	1.00
Satd. Flow (perm)	3433	1583	3518		78	3539
Peak-hour factor, PHF	0.86	0.73	0.93	0.63	0.92	0.95
Adj. Flow (vph)	294	640	2080	86	391	2807
RTOR Reduction (vph)	0	7	2	0	0	0
Lane Group Flow (vph)	294	633	2164	0	391	2807
Turn Type	Prot	pt+ov	NA		pm+pt	NA
Protected Phases	4	4 5	6		5	2
Permitted Phases					2	
Actuated Green, G (s)	16.0	48.0	89.0		121.0	121.0
Effective Green, g (s)	16.0	41.0	89.0		121.0	121.0
Actuated g/C Ratio	0.11	0.27	0.59		0.81	0.81
Clearance Time (s)	6.0		7.0		7.0	7.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	366	432	2087		344	2854
v/s Ratio Prot	0.09	c0.40	0.62		0.19	0.79
v/s Ratio Perm					c0.73	
v/c Ratio	0.80	1.47	1.04		1.14	0.98
Uniform Delay, d1	65.5	54.5	30.5		57.8	13.6
Progression Factor	1.00	1.00	0.79		1.16	1.80
Incremental Delay, d2	12.0	222.2	27.3		82.9	10.4
Delay (s)	77.5	276.7	51.5		150.1	34.8
Level of Service	E	F	D		F	C
Approach Delay (s)	214.0		51.5			48.9
Approach LOS	F		D			D
Intersection Summary						
HCM 2000 Control Delay			74.3		HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio			1.28			
Actuated Cycle Length (s)			150.0		Sum of lost time (s)	20.0
Intersection Capacity Utilization			101.8%		ICU Level of Service	G
Analysis Period (min)			15			
c Critical Lane Group						

Intersection

Int Delay, s/veh 448.3

Movement	SEL	SET	NWT	NWR	SWL	SWR
Traffic Vol, veh/h	38	2271	3126	92	127	65
Future Vol, veh/h	38	2271	3126	92	127	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	78	89	96	75	63	48
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	49	2552	3256	123	202	135

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	3379	0	4691
Stage 1	-	-	3318
Stage 2	-	-	1373
Critical Hdwy	4.14	-	6.84
Critical Hdwy Stg 1	-	-	5.84
Critical Hdwy Stg 2	-	-	5.84
Follow-up Hdwy	2.22	-	3.52
Pot Cap-1 Maneuver	79	-	~ 1
Stage 1	-	-	~ 16
Stage 2	-	-	~ 200
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	79	-	0
Mov Cap-2 Maneuver	-	-	~ 12
Stage 1	-	-	~ 16
Stage 2	-	-	~ 76

Approach	SE	NW	SW
HCM Control Delay, s	2	0	\$ 8386.1
HCM LOS			F

Minor Lane/Major Mvmt	NWT	NWR	SEL	SETSWLn1
Capacity (veh/h)	-	-	79	- 18
HCM Lane V/C Ratio	-	-	0.617	-18.722
HCM Control Delay (s)	-	-	106	\$ 8386.1
HCM Lane LOS	-	-	F	- F
HCM 95th %tile Q(veh)	-	-	2.8	- 42.8

Notes

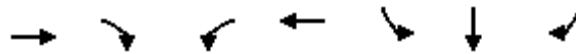
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Timings

Champions Tract #3 TIA

4: Loop 360 SB & FM 2222

2016 Build Out Conditions Mitigated - PM Peak



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR	ø1	ø2	ø4	ø5	ø6
Lane Configurations	↑↑↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑					
Traffic Volume (vph)	1796	602	399	2222	200	37	1115					
Future Volume (vph)	1796	602	399	2222	200	37	1115					
Lane Group Flow (vph)	1891	708	464	2267	182	191	1225					
Turn Type	NA	Free	D.P+P	NA	Split	NA	Free					
Protected Phases	1 2		6 7	1 2 6 7	4 5	4 5		1	2	4	5	6
Permitted Phases		Free	1 2				Free					
Detector Phase	1 2		6 7	1 2 6 7	4 5	4 5						
Switch Phase												
Minimum Initial (s)								1.0	25.0	5.0	1.0	1.0
Minimum Split (s)								8.0	31.0	11.0	8.0	22.0
Total Split (s)								8.0	40.0	9.0	11.0	53.0
Total Split (%)								5%	27%	6%	7%	35%
Yellow Time (s)								4.0	4.0	4.0	4.0	4.0
All-Red Time (s)								2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag								Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?								Yes	Yes	Yes	Yes	Yes
Recall Mode								Min	C-Max	Min	Min	Min
v/c Ratio	1.05	0.45	0.49	0.78	1.17	1.17	0.77					
Control Delay	91.1	0.3	4.7	10.5	180.4	180.4	3.8					
Queue Delay	19.1	0.0	1.0	47.5	0.0	0.0	0.0					
Total Delay	110.3	0.3	5.7	58.0	180.4	180.4	3.8					
Queue Length 50th (ft)	~595	0	48	1223	~221	~233	0					
Queue Length 95th (ft)	m532	m0	m45	m840	#385	75	0					
Internal Link Dist (ft)	712			342		1059						
Turn Bay Length (ft)												
Base Capacity (vph)	1794	1583	946	2925	156	163	1583					
Starvation Cap Reductn	0	0	248	1149	0	0	0					
Spillback Cap Reductn	149	0	0	0	0	0	0					
Storage Cap Reductn	0	0	0	0	0	0	0					
Reduced v/c Ratio	1.15	0.45	0.66	1.28	1.17	1.17	0.77					

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

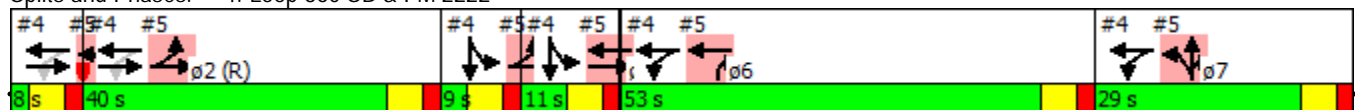
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Loop 360 SB & FM 2222



Kimley-Horn

Synchro 9 Report

Timings

4: Loop 360 SB & FM 2222

Champions Tract #3 TIA

2016 Build Out Conditions Mitigated - PM Peak

Lane Group	ø7
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	7
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	8.0
Total Split (s)	29.0
Total Split (%)	19%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Recall Mode	Min
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

4: Loop 360 SB & FM 2222

2016 Build Out Conditions Mitigated - PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↗	↖	↑↑					↘	↙	↗
Traffic Volume (vph)	0	1796	602	399	2222	0	0	0	0	200	37	1115
Future Volume (vph)	0	1796	602	399	2222	0	0	0	0	200	37	1115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0	6.0	4.0
Lane Util. Factor		0.86	1.00	1.00	0.95					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		6408	1583	1770	3539					1681	1750	1583
Flt Permitted		1.00	1.00	0.10	1.00					0.95	0.99	1.00
Satd. Flow (perm)		6408	1583	177	3539					1681	1750	1583
Peak-hour factor, PHF	0.92	0.95	0.85	0.86	0.98	0.92	0.92	0.92	0.92	0.89	0.25	0.91
Adj. Flow (vph)	0	1891	708	464	2267	0	0	0	0	225	148	1225
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1891	708	464	2267	0	0	0	0	182	191	1225
Turn Type		NA	Free	D.P+P	NA					Split	NA	Free
Protected Phases		1 2		6 7	1 2 6 7					4 5	4 5	
Permitted Phases			Free	1 2								Free
Actuated Green, G (s)		42.0	150.0	118.0	124.0					14.0	14.0	150.0
Effective Green, g (s)		42.0	150.0	118.0	124.0					14.0	14.0	150.0
Actuated g/C Ratio		0.28	1.00	0.79	0.83					0.09	0.09	1.00
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)		1794	1583	946	2925					156	163	1583
v/s Ratio Prot		c0.30		0.25	c0.64					0.11	c0.11	
v/s Ratio Perm			0.45	0.14								c0.77
v/c Ratio		1.05	0.45	0.49	0.78					1.17	1.17	0.77
Uniform Delay, d1		54.0	0.0	18.6	6.3					68.0	68.0	0.0
Progression Factor		1.22	1.00	0.26	1.57					1.00	1.00	1.00
Incremental Delay, d2		29.6	0.3	0.0	0.1					123.9	124.2	3.8
Delay (s)		95.3	0.3	4.8	10.0					191.9	192.2	3.8
Level of Service		F	A	A	A					F	F	A
Approach Delay (s)		69.4			9.1			0.0			47.7	
Approach LOS		E			A			A			D	

Intersection Summary

HCM 2000 Control Delay	40.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	36.0
Intersection Capacity Utilization	113.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Timings

Champions Tract #3 TIA

5: Loop 360 NB & FM 2222

2016 Build Out Conditions Mitigated - PM Peak



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	ø1	ø2	ø4	ø5	ø6
Lane Configurations	↔↔	↑↑	↑↑↑	↗	↖	↖	↗					
Traffic Volume (vph)	892	1099	1888	56	737	41	568					
Future Volume (vph)	892	1099	1888	56	737	41	568					
Lane Group Flow (vph)	980	1182	1946	106	425	431	701					
Turn Type	Prot	NA	NA	Free	Split	NA	custom					
Protected Phases	2 4	2 4 5	5 6		1 7	1 7	1 6 7	1	2	4	5	6
Permitted Phases				Free								
Detector Phase	2 4	2 4 5	5 6		1 7	1 7	1 6 7					
Switch Phase												
Minimum Initial (s)								1.0	25.0	5.0	1.0	1.0
Minimum Split (s)								8.0	31.0	11.0	8.0	22.0
Total Split (s)								8.0	40.0	9.0	11.0	53.0
Total Split (%)								5%	27%	6%	7%	35%
Yellow Time (s)								4.0	4.0	4.0	4.0	4.0
All-Red Time (s)								2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag								Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?								Yes	Yes	Yes	Yes	Yes
Recall Mode								Min	C-Max	Min	Min	Min
v/c Ratio	1.00	0.93	0.99	0.07	1.22	1.23	0.75					
Control Delay	24.9	12.1	51.3	0.0	172.6	174.8	26.9					
Queue Delay	36.1	45.5	39.2	0.0	0.0	0.0	0.1					
Total Delay	61.0	57.7	90.5	0.0	172.6	174.8	27.0					
Queue Length 50th (ft)	147	610	587	0	~536	~546	435					
Queue Length 95th (ft)	m95	m37	#799	0	#765	#585	486					
Internal Link Dist (ft)		342	774			892						
Turn Bay Length (ft)												
Base Capacity (vph)	984	1274	1966	1583	347	350	934					
Starvation Cap Reductn	99	265	0	0	0	0	0					
Spillback Cap Reductn	0	0	214	0	0	0	13					
Storage Cap Reductn	0	0	0	0	0	0	0					
Reduced v/c Ratio	1.11	1.17	1.11	0.07	1.22	1.23	0.76					

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.

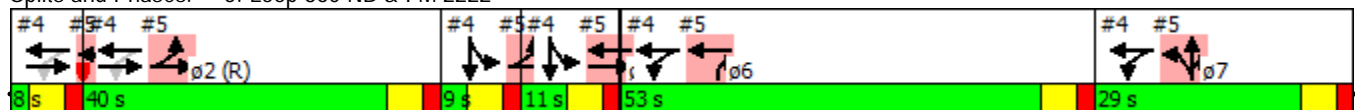
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Loop 360 NB & FM 2222



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Synchro 9 Report

Timings

5: Loop 360 NB & FM 2222

Champions Tract #3 TIA

2016 Build Out Conditions Mitigated - PM Peak




















Lane Group	ø7
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	7
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	8.0
Total Split (s)	29.0
Total Split (%)	19%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Recall Mode	Min
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

5: Loop 360 NB & FM 2222

2016 Build Out Conditions Mitigated - PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	892	1099	0	0	1888	56	737	41	568	0	0	0
Future Volume (vph)	892	1099	0	0	1888	56	737	41	568	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	4.0	6.0	6.0	6.0			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.95	0.95	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (prot)	3433	3539			5085	1583	1681	1696	1583			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (perm)	3433	3539			5085	1583	1681	1696	1583			
Peak-hour factor, PHF	0.91	0.93	0.92	0.92	0.97	0.53	0.92	0.75	0.81	0.92	0.92	0.92
Adj. Flow (vph)	980	1182	0	0	1946	106	801	55	701	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	48	0	0	0
Lane Group Flow (vph)	980	1182	0	0	1946	106	425	431	653	0	0	0
Turn Type	Prot	NA			NA	Free	Split	NA	custom			
Protected Phases	2 4	2 4 5			5 6		1 7	1 7	1 6 7			
Permitted Phases						Free						
Actuated Green, G (s)	43.0	54.0			58.0	150.0	31.0	31.0	84.0			
Effective Green, g (s)	43.0	54.0			58.0	150.0	31.0	31.0	84.0			
Actuated g/C Ratio	0.29	0.36			0.39	1.00	0.21	0.21	0.56			
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)	984	1274			1966	1583	347	350	886			
v/s Ratio Prot	c0.29	c0.33			c0.38		0.25	c0.25	0.41			
v/s Ratio Perm						0.07						
v/c Ratio	1.00	0.93			0.99	0.07	1.22	1.23	0.74			
Uniform Delay, d1	53.4	46.1			45.7	0.0	59.5	59.5	24.7			
Progression Factor	0.28	0.21			0.87	1.00	1.00	1.00	1.00			
Incremental Delay, d2	7.7	1.4			11.2	0.0	124.2	126.6	3.2			
Delay (s)	22.6	10.9			51.1	0.0	183.7	186.1	28.0			
Level of Service	C	B			D	A	F	F	C			
Approach Delay (s)		16.2			48.5			114.2			0.0	
Approach LOS		B			D			F			A	
Intersection Summary												
HCM 2000 Control Delay			54.1				HCM 2000 Level of Service		D			
HCM 2000 Volume to Capacity ratio			1.24									
Actuated Cycle Length (s)			150.0				Sum of lost time (s)		36.0			
Intersection Capacity Utilization			113.5%				ICU Level of Service		H			
Analysis Period (min)			15									
c Critical Lane Group												

Timings

6: FM 2222 & Lakewood Dr

Champions Tract #3 TIA

2016 Build Out Conditions Mitigated - PM Peak



Lane Group	EBL	EBT	WBT	SBL
Lane Configurations				
Traffic Volume (vph)	216	1577	1740	21
Future Volume (vph)	216	1577	1740	21
Lane Group Flow (vph)	284	1752	1980	188
Turn Type	pm+pt	NA	NA	Prot
Protected Phases	5	2	6	8
Permitted Phases	2			
Detector Phase	5	2	6	8
Switch Phase				
Minimum Initial (s)	5.0	25.0	25.0	5.0
Minimum Split (s)	12.0	32.0	32.0	22.0
Total Split (s)	25.0	125.0	100.0	25.0
Total Split (%)	16.7%	83.3%	66.7%	16.7%
Yellow Time (s)	5.0	5.0	5.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	6.0
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?	Yes		Yes	
Recall Mode	None	C-Min	C-Min	None
v/c Ratio	0.80	0.59	0.91	0.76
Control Delay	57.8	5.0	32.5	42.3
Queue Delay	0.0	1.0	0.0	0.0
Total Delay	57.8	6.0	32.5	42.3
Queue Length 50th (ft)	181	58	841	56
Queue Length 95th (ft)	m#309	700	973	56
Internal Link Dist (ft)		774	667	639
Turn Bay Length (ft)	200			
Base Capacity (vph)	353	2958	2185	320
Starvation Cap Reductn	0	857	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.80	0.83	0.91	0.59

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 48 (32%), Referenced to phase 2:EBTL and 6:WBT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: FM 2222 & Lakewood Dr



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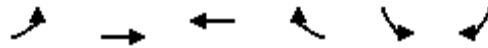
Synchro 9 Report

HCM Signalized Intersection Capacity Analysis

Champions Tract #3 TIA

6: FM 2222 & Lakewood Dr

2016 Build Out Conditions Mitigated - PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	216	1577	1740	58	21	135
Future Volume (vph)	216	1577	1740	58	21	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0		6.0	
Lane Util. Factor	1.00	0.95	0.95		1.00	
Frt	1.00	1.00	0.99		0.89	
Flt Protected	0.95	1.00	1.00		0.99	
Satd. Flow (prot)	1770	3539	3521		1641	
Flt Permitted	0.04	1.00	1.00		0.99	
Satd. Flow (perm)	75	3539	3521		1641	
Peak-hour factor, PHF	0.76	0.90	0.91	0.85	0.64	0.87
Adj. Flow (vph)	284	1752	1912	68	33	155
RTOR Reduction (vph)	0	0	2	0	119	0
Lane Group Flow (vph)	284	1752	1978	0	69	0
Turn Type	pm+pt	NA	NA		Prot	
Protected Phases	5	2	6		8	
Permitted Phases	2					
Actuated Green, G (s)	125.4	125.4	92.7		11.6	
Effective Green, g (s)	125.4	125.4	92.7		11.6	
Actuated g/C Ratio	0.84	0.84	0.62		0.08	
Clearance Time (s)	7.0	7.0	7.0		6.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	353	2958	2175		126	
v/s Ratio Prot	c0.14	0.50	c0.56		c0.04	
v/s Ratio Perm	0.54					
v/c Ratio	0.80	0.59	0.91		0.55	
Uniform Delay, d1	51.5	4.0	25.0		66.7	
Progression Factor	1.06	0.99	1.00		1.00	
Incremental Delay, d2	7.6	0.5	7.1		4.8	
Delay (s)	62.0	4.5	32.1		71.5	
Level of Service	E	A	C		E	
Approach Delay (s)		12.5	32.1		71.5	
Approach LOS		B	C		E	

Intersection Summary

HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	88.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group